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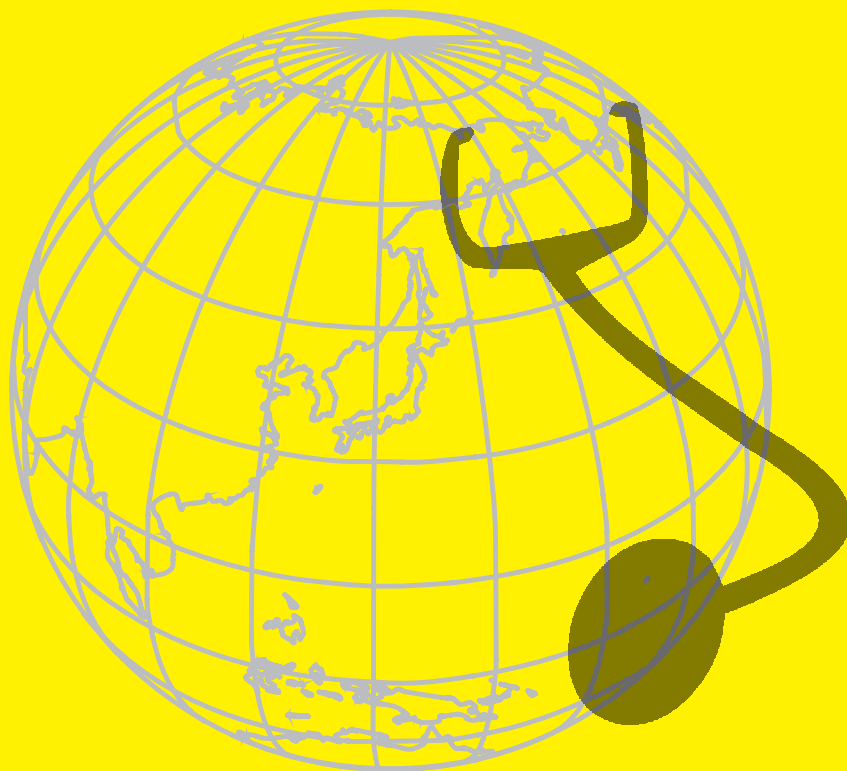
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Editor

Dr. R.K. Sharma

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Double Burden of Malnutrition: Indian Regional Perspective

A K Ravishankar

Assistant Professor, Department of Population Studies, Annamalai University, Annamalainagar

ABSTRACT

Over nutrition are emerged as public health problems in India for the last two decades. Under this backdrop, this paper attempts to investigate nutritional status of women in India by regions and its relation to the prevalence of chronic energy deficiency and obesity and to identify the major determinants of the burden of malnutrition in India. Data drawn from the National Family Health Survey-III, conducted 2005-06, on body mass index of 78262 currently married women, ages 15-49 years.

Data reveals that regional differences is noticed in the levels of underweight and obesity in India. Eastern states show highest incidence rate of underweight (35.5percent) and the northern states recorded lowest incidence of CED (19.5percent). Southern states had highest prevalence rate of obese women (26.2percent) and lowest rate is found in eastern and northeastern states. Burden of both chronic energy deficiency and obesity are almost equally present in four zones out of six, indicate that there is a need for special public health programs that are able to address both under weight and overweight.

Keywords: *Under nutrition, over nutrition, Body Mass Index*

INTRODUCTION

India experienced high prevalence of under-nutrition for the past several decades however this era of transition has brought the burden of both under-nutrition and over nutrition¹. More particularly, over the last twenty years, over nutrition and obesity are emerged as public health problems in India. Under this backdrop, this paper attempts to explore the nutritional status of women in India by regions and its relation to the prevalence of problem of the chronic energy deficiency and obesity and lastly to identify the major determinants of the burden of malnutrition in India.

MATERIALS AND METHOD

The anthropometric data used for this analysis are derived from the National Family Health Survey-III, a nationally represented large scale sample survey conducted in India during 2005-06 (NFHS-III). Totally 78262 currently married women are included in the CED and obesity analysis.

FINDINGS

The overall picture indicates that in India, about 54 percent classified as normal and about 27 percent as underweight, conforming grades I - III CED while 19 percent are overweight, out of which 4.5 percent are obese grade II. It can be inferred from the analysis that on the whole, the India experiencing the double burden of malnutrition. The regional data discloses that the percent prevalence of CED (grades I-III) and obesity (grades I-II) for all six regions are apparently quite contradictory. The percent prevalence of CED is as high as 36 percent in the east zone and low at the north-east zone (19.5percent). With regard to prevalence rate of obesity, the south registered the highest proportion (26.2percent) and the east recorded the lowest proportion (12.9percent). However, the percentage of severe thinness is higher in the east (6.7percent) followed by the west (5.9percent) and the central states (5.6percent). With regard to second degree of obesity the southern states registered the highest proportion (6.7percent) followed by the northern (5.9percent) and the western (5.6percent).

states. A similar trend is noticed with regard to the incidence of first degree of obesity.

In general, the north zone experience burden of under nutrition and over nutrition equally and in the southern states, the overweight exceeded underweight. On contrast in the east and the central regions the problems of underweight overshadowed the overweight problem. This analysis reveals that the obesity emerged as important problems invariably in all the six regions in conjunction with under nutrition specifically in the south, north and the west regions.

In summary, the prevalence of CED, overweight, and obesity in India were 26.9 percent, 14.3percent, and 4.6percent, respectively. The dual burden of malnutrition is noticed in the north, south, west and the north-east regions however the magnitude of the problem is differed. The incidences of CED and obesity are negatively related in the remaining two zones.

Burden of Malnutrition by regions and characteristics: Results of the bivariate analysis using chi-square test showed a significant association between the BMI groups and each of the explanatory variables (Table 2 and 3). Prevalence rate of CED is declines with aged women irrespective of all zones. CED levels are higher among adolescent mothers (it ranges from 50.2 percent among western states mothers to 30.34 percent among the eastern zone mothers) than the rest of age-groups which is consistent with the findings of other studies^{4,5}. On contrast, the obesity levels are higher among upper age-group mothers (45-49) and lower among adolescents mothers invariably in all the six regions. It can be inferred from the analysis that under nutrition declines and over nutrition increases with age of women, irrespective of zones. Typically the percent prevalence of CED is higher among the rural women than their counterpart invariably in all the zones. With regard to urban women this trend is just opposite. This result consistent with finding of Zerihun⁶ and Ferro-Luzzi⁷ studies that a higher rate of malnutrition in rural women.

The prevalence of under-nutrition is nearly five times higher among women with no education than those with 12 and more years of schooling in the south and east zones. This rate is about three and half times higher in the remaining zones. The prevalence of obesity is eight times higher among women with 12 and more years of schooling than those with no education in east zone, 6 times higher among central and 3 times higher in the remaining zones. These

findings consistent with Teller and Yimar⁸ results that there is a negative relationship between women's higher level of education and the proportion of undernourished women.

Prevalence of underweight and overweight shows similar variations by occupation and wealth index. With regard to occupational status, invariably in all the six regions the prevalence of underweight is lower among the women working in non-agricultural sector than the women working in agricultural sector. This rate among non-agricultural sector ranges from 7.2 (north region) to 20.2 (east region) and this proportion for agricultural sector ranges from 20.8 in the north-east to 48.4 percent in the eastern states. Regarding the incidence of obesity, the women working in non-agricultural sector and not working category recorded relatively higher proportion than the women working in the agricultural sector, irrespective of all regions.

CED prevalence levels are almost seven times higher among women living in the poorest wealth index in the east and the south regions. The incidence of obesity is ten times higher among the richest wealth index women than the poorest women in the south, west, central and the east regions. A strong negative association is noticed between the food intake practice and incidence of malnutrition. With regard to food intake practices, the proportion of women who taken fruits and non-vegetarian never/occasionally is reported higher incidence of CED. It has been observed that invariably in all six zones, the prevalence of obese exceeded underweight among older women, women from urban areas, Muslim women, higher educated women, not-working women, richest wealth index women, who watches television almost every day and who consumes fruits and non-vegetarian at least once in a week.

In summary, the study results reveal that the socioeconomic demographic and lifestyle factors have great implications for women's CED and obesity. This fact is widely acknowledged by several studies. These include the socioeconomic (e.g., occupation, educational background and the standard of living); cultural (e.g., religion and caste); the demographic (e.g., age and marital status) and dietary characteristics^{4,5}.

Regression result on underweight women with those of normal weight show that almost in each of the variables the odds decrease with the categories of a variable when compared to the respective variable's first category indicating a decreasing chance for

experiencing underweight when improving the background conditions of women. It can be concluded that socio-economic, demographic (except caste) and lifestyle variables (except non-vegetarian intake) are significantly determining the women's CED status. On the other hand, all the socio-economic, demographic and lifestyle variables are significantly determining the women's overweight.

CONCLUSION

Present study explore the burden of malnutrition in India by regions and investigate the influence of socio-economic, demographic and life style factors on risk of underweight and over weight is intended to fill a void in the study of double burden of malnutrition. The general belief is that the developing countries always recorded less incidence of overweight than underweight however, Mentez⁹ observed that the proportion overweight exceeded the proportion underweight in a majority of the counties. This study also confirms a similar situation among all the southern states. At the same time, Popkin¹⁰ observed that significant proportions of overweight and obese individuals now coexist with the undernourished. This study also acknowledged such a trend in the north region and in the western and the north-eastern regions (with small differences). It can be concluded that from the both observation that many parts of India shows some promising nutrition transition which is consistent with the findings of Radhakrishna and Ravi¹¹.

Further, this study finds that prevalence of obesity is higher among economically better off women, women who live in urban areas and have a sedentary lifestyle (not working and watching TV almost every day). Similar results have been reported by Zargar¹² and Griffiths and Benley⁵ also supported the findings. The findings from the logistic regression analysis suggest that, mostly similar set of factors is relevant to both CED and obese. For example, age of the mother, residence, literacy status, wealth index and lifestyle indicators are positively and significantly associated with obesity and these factors are all inversely related to with low BMI. These results are fairly consistent with findings of many other developing countries which are in the early stage of nutrition transition¹³.

Major findings came out from this study are

- Southern region already experienced the nutrition transition (overweight exceeds underweight)
- North, west and the north-east regions are at the early stage of nutrition transition
- Findings from the logistic regression analysis disclose that mostly similar set of factors is relevant to both underweight and overweight.
- One of the most significant predictors of malnutrition is the economic condition of household.

Table 1. Percentage Distribution of Non-pregnant Women Aged 15-49 Years, Classified as Thinness, Normal Weight and Obese by Regions

Regions	Nutritional Grade							Total
	Thinness			Normal		Obesity		no. of
	Severe	Moderate	Mild	Low Normal	Well Nourished	I degree	II degree	mothers*
	(>15.99)	(16.00-16.99)	(17.00-18.49)	(18.50-19.99)	(20.00-24.99)	(25.00-29.99)	(<30.00)	
North	3.4	5.4	13.6	16.0	38.8	16.8	5.9	14656
Central	5.6	8.5	18.8	19.3	33.2	11.0	3.6	14529
East	6.7	8.8	20.0	18.6	33.0	10.2	2.7	12146
North-east	2.6	4.1	12.8	18.6	48.4	11.5	1.9	12107
West	5.9	7.4	14.8	14.3	35.8	16.2	5.6	10021
South	4.7	5.9	12.6	14.0	36.5	19.5	6.7	14803
Total	4.8	6.7	15.4	16.8	37.5	14.3	4.5	78262
	26.9			54.4		18.8		

* Excludes mothers who are all currently pregnant and those who given birth in the month of interview.

Table 2. Percentage Distribution of Non-pregnant Women by CED according to their Background Characteristics by Regions

SED Characteristics of Mothers*	Chronic Energy Deficiency					
	North	Central	East	NorthEast	West	South
Age	†	†	†	†	†	†
15-19	35.5	36.8	45.7	30.3	50.2	36.5
20-24	32.9	39.9	43.8	26.2	41.5	35.5
25-29	26.7	35.4	38.0	21.5	33.7	26.1
30-34	22.9	34.5	32.9	17.6	28.6	21.8
35-39	17.4	30.3	31.5	15.5	23.5	18.9
40-44	15.6	26.2	29.7	15.1	18.5	16.4
45-49	14.6	24.7	28.5	17.7	15.5	16.1
Residence	†	†	†	†	†	†
Rural	27.8	40.6	45.4	22.9	39.1	31.1
Urban	13.8	21.9	20.3	14.1	19.9	14.4
Religion	†	†	NS	†	†	†
Hindu	24.4	33.8	35.0	22.3	29.5	25.5
Muslim	21.7	29.8	37.8	35.2	23.6	14.2
Christian	8.6	20.9	34.6	14.2	15.3	13.1
Caste	†	†	†	†	†	†
ST	40.5	49.1	50.8	13.2	47.5	42.6
SC	28.1	37.9	44.8	28.8	34.1	29.0
OBC	26.5	34.2	37.2	20.7	29.9	23.3
Literacy	†	†	†	†	†	†
No education	28.4	39.8	46.5	25.7	39.2	34.6
Primary	22.8	33.0	36.1	22.2	30.4	25.1
Secondary	18.8	25.7	24.0	16.4	24.4	17.6
Higher	7.9	10.9	8.0	7.3	14.2	7.5
Occupation	†	†	†	†	†	†
Not working	20.4	27.7	30.5	21.4	22.6	18.2
Agricultural Sector	29.2	41.6	48.4	20.8	39.4	33.8
Non- Agri Sector	7.2	17.2	20.2	8.6	15.1	10.2
Wealth index	†	†	†	†	†	†
Poorest	42.4	49.2	54.5	32.7	58.8	46.7
Poorer	39.8	42.0	47.8	29.9	51.6	43.4
Middle	31.0	35.2	34.4	23.7	42.7	31.5
Richer	23.2	27.2	25.3	14.6	27.5	18.3
Richest	10.8	12.9	8.6	7.5	13.9	7.2
Media (watchingTV)	†	†	†	†	†	†
Not at all	34.2	44.5	48.5	26.8	46.7	38.1
Less than once a week	27.2	34.2	43.5	22.4	34.9	29.7
At least once a week	22.3	32.1	33.3	20.7	32.2	27.1
Almost every day	15.5	20.8	19.5	13.9	20.4	18.0
Fruits intake	†	†	†	†	†	†
Never/occasionally	27.4	37.5	40.9	23.1	36.6	30.0
At least once a week	15.6	24.1	22.0	15.4	22.7	19.0
Fish/Chicken/Egg	†	§	†	†	††	†
Never/occasionally	23.2	33.3	40.7	20.2	29.8	28.6
At least once a week	18.8	32.4	32.3	19.3	36.4	21.4
TOTAL	14656	14529	12146	12146	12107	14803

†, †† and § refers to significant at 0.1%, 1% and 5% level (chi-square results – Nutritional level and SED characteristics). NS refers to not significant

Table 3 Percentage Distribution of Non-pregnant Women Aged 15-49 Years by Obesity by Regions according to their Background Characteristics

SED Characteristics of Mothers*	Obesity					
	North	Central	East	N-East	West	South
Age	†	†	†	†	†	†
15-19	2.7	1.7	1.6	2.3	1.7	6.4
20-24	7.2	5.0	4.0	4.3	6.7	12.5
25-29	15.0	10.4	8.8	8.3	14.1	19.8
30-34	22.4	13.8	14.1	13.4	20.1	27.9
35-39	28.0	19.8	19.0	18.6	28.9	31.1
40-44	34.3	22.6	21.1	20.3	32.3	37.9
45-49	38.5	27.1	21.2	21.5	36.5	37.2
Residence	†	†	†	†	†	†
Rural	15.7	5.2	4.3	8.7	12.3	15.9
Urban	34.1	27.9	26.2	21.1	28.9	37.8
Religion	†	†	NS	†	†	†
Hindu	20.0	13.4	13.2	16.0	20.2	23.2
Muslim	21.2	19.7	11.2	10.3	27.0	39.6
Christian	36.2	20.9	12.5	10.1	37.9	36.0
Others	40.2	37.2	13.7	16.1	19.0	22.4
Caste	†	†	†	†	†	†
ST	5.7	2.3	1.9	10.6	7.6	7.8
SC	17.4	9.4	7.8	12.9	15.1	17.9
OBC	16.0	11.4	8.1	14.2	17.9	25.8
None of them	28.5	28.2	21.3	17.7	27.7	33.7
Literacy	†	†	†	†	†	†
No education	14.5	7.5	5.0	8.1	12.3	13.7
Primary	22.6	13.6	10.7	10.2	17.9	22.4
Secondary	28.2	20.8	20.8	15.8	25.2	32.9
Higher	40.9	41.4	39.4	28.3	34.9	45.2
Occupation	†	†	†	†	†	†
Not working	25.8	19.9	16.1	13.7	26.7	32.8
Agricultural Sector	12.8	5.6	4.0	8.5	11.7	13.2
Non- Agri Sector	44.1	30.9	27.7	24.3	33.3	40.3
Wealth index	†	†	†	†	†	†
Poorest	3.9	1.7	1.1	1.8	1.9	4.0
Poorer	6.0	3.2	3.1	3.9	3.9	7.5
Middle	9.7	8.2	7.2	7.3	8.0	13.1
Richer	17.9	17.1	17.4	16.6	17.8	27.3
Richest	38.8	38.0	38.7	28.7	35.8	48.9
Media (watchingTV)	†	†	†	†	†	†
Not at all	8.9	4.2	2.8	4.8	7.9	11.4
Less than once a week	17.9	9.4	7.8	7.6	15.0	18.1
At least once a week	21.4	13.8	12.4	12.6	17.5	20.0
Almost every day	31.1	27.5	25.6	20.8	28.0	32.0
Fruits	†	†	†	†	†	†
Never/occasionally	16.5	9.0	8.3	10.4	14.2	18.2
At least once a week	31.4	25.1	24.4	17.0	27.1	31.3
Fish/Chicken/Egg	†	§	†	†	††	†
Never/occasionally	22.0	14.1	7.8	10.2	21.1	20.3
At least once a week	26.1	16.3	16.2	14.7	22.5	28.3
TOTAL	14656	14529	12146	12146	12107	14803

†, †† and § refers to significant at 0.1%, 1% and 5% level (chi-square results – Nutritional level and SED characteristics). NS refers to not significant

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Utility of Lot Quality Assurance Sampling (LQAS) as a Tool to Monitor the Immunization Services by Local Managers in Developing Countries

Mane Abhay B¹, Gite Sunil V¹

¹Assistant Professor, Department of Community Medicine, MIMSR Medical College, Latur, Maharashtra

ABSTRACT

Purpose: To find out how Lot Quality Assurance Sampling (LQAS) method is useful to monitor immunization services by local managers at Primary Health Centre level.

Objectives:

1. To identify the areas of low coverage of immunization under selected PHC's
2. To find various reasons for immunization failure in areas with low coverage

Methods: Study design: Lot quality assurance sampling method.

Study setting: Rural area.

Sample size: 338 children 12-23 months of age.

Results: LQAS is a useful method for routine monitoring of immunization services on a small area basis, especially as the overall coverage increases. In the present study, it helped us to identify the areas with low coverage seen in 4 Subcentres out of 13 studied. The overall immunization coverage was 86.01 % and the dropout rate was 8.66 %. The predominant reasons for immunization failure were mother out of village on scheduled day of vaccination and unaware to return for next dose.

Conclusions: The lot quality assurance sampling method helps the medical officers of PHC to identify areas with low vaccination coverage. This helps us to direct interventions in these areas on priority basis when resources are limited as in developing countries.

Keywords: Lot Quality Assurance Method, Immunization Coverage

INTRODUCTION

Immunization is the most powerful among all public health interventions. The Universal Immunization Programme (UIP) was started in India with the aim of achieving at least 85 % coverage of primary immunization of infants by the year 1990 ^[1].

Corresponding author:

Mane Abhay B

Address: Behind Pillay Niwas
Vikram Nagar, Barshi Road
Latur- 413531
Maharashtra, India
Phone: 02382-222790
Email: drabmane@yahoo.co.in

The greatest challenge is to make immunization services available to all sections of population. Globally, an estimated 24 million children remained unreached by the immunization programme in 2008^[2]. It is of serious concern that in South East Asia region immunization coverage progress is plateauing in last few years. Identified areas of concern were low coverage pockets, poor monitoring and high drop outs^[3]. Immunization rates are regularly measured through the cluster sampling method recommended by World Health Organization (WHO). But it does not indicate the precise location of areas with low vaccination coverage^[4] & hence not useful for local managers^[5].

Lot Quality Assurance Survey (LQAS) originated in the manufacturing industry for quality control

purposes^[5,6]. LQAS method is an example of stratified sampling, where the lots play the role of the strata^[7]. LQAS method has been used to monitor immunization coverage, Contraception use, ORT use, Sero-surveys, Health workers performance.^[5, 8, 9, 10, 14,19] This method can give reliable information on a small geographic or administrative unit using a small sample.^[5,12] It is meant to assist local managers to monitor the performance of health services in their catchment area. It can be applied by medical officer of Primary Health Centre (PHC) / local health personnel to know deficient areas in order to focus more on those areas.

LQAS is oriented toward practical action by helping to identify areas with low coverage to focus scarce supervisory resources^[5]. For immunization assessment, 'Acceptability' is usually determined by whether the lot meets some desired proportion of immunization coverage.

Hence an LQAS study was undertaken in the three adopted PHC's to find the utility of it in identifying Subcentres with low immunization coverage.

MATERIAL & METHOD

The study was conducted in 3 Primary Health Centre's (PHC) adopted by the Department of Community Medicine serving to population of approximately 78,492 under them through 13 Subcentres. Written permission was obtained from the Principal and District Health officer for the study. Each Subcentre was designated as a lot for the present study. The list of all villages with number of households in each Subcentre was obtained from the PHC records. The first house was identified randomly from the list of households in a village under each Subcentre. The selected house was visited to find an eligible child between 12 – 23 months of age in that house. If no eligible child was found, the next consecutive house was visited until an eligible child was found. In case of more than one eligible child in a house, only the youngest eligible child was selected. The evidence used to record immunization details was card plus history and all 'Timely' doses given before 12 months of age were counted.^[10]

· Criteria decided for present LQ study^[11]:

Immunization Coverage

1. Fully immunized: A child who had received one dose of BCG, three doses of DPT and OPV each and one dose of measles before one year of age.

2. Partially immunized: A child who had received some of the above vaccines but not all.

3. Non-immunized: A child who did NOT received any of the above mentioned vaccines.

- Desired level of accuracy for the survey results was set at – 5 %
- Desired level of Confidence for the survey results was decided to be – 95 %
- The total sample size estimated from the table for desired level of accuracy and level of confidence was- 384
- Estimated size of the Target population (12-23months age) in the 3 PHC area- 2369
- The sampling fraction was calculated to decide whether one should reduce the sample size or not. – 16.20 %
- The sampling fraction was more than 10 %. So Revised sample calculated was - 331
- The number of lots to be studied was – 13 Subcentres
- The minimum lot sample size calculated was- 26 eligible children per lot
- The decision value^[12] from the table for lot sample size with low threshold (65%) and high threshold (95 %) was- 3

This decision value helps us to decide that a lot is unacceptable if we find more than 3 children unvaccinated or partially vaccinated.

RESULTS

LQAS analysis was done to find out the Subcentres with low coverage and to determine overall immunization coverage. Card availability in Subcentres varied (range 15 – 65%). The LQAS analysis in each lot was to find out the acceptability of lot with regards to immunization coverage. In four Subcentres, more than three children were unvaccinated, and vaccination coverage was considered to be low and labeled as unacceptable lots. In the remaining nine Subcentres coverage was good as the number of unvaccinated children did not exceed three and labeled as acceptable lots (Table 1).

Table 1: - LQAS results to identify Subcentres with low coverage under 3 PHC

PHC	No. of	No. of Lots/Subcentres identified for	
	Subcentre	Low coverage*	Acceptable coverage
PHC 1	5	2	3
PHC 2	4	1	3
PHC 3	4	1	3
TOTAL 1	3	4	9

*More than 3 children unimmunized/partially immunized (decision value -3)

All data were pooled to estimate overall total immunization coverage and dropout rate. Table 2 shows the overall coverage for BCG vaccine was 94.67 %, which dropped to 86.01 % for measles vaccine. Hence the dropout rate was 8.66 %. As per NFHS-3 the dropout rate of 10.9 % in Rural Maharashtra ^[13] for measles was higher than our study.

Table 2: Immunization coverage determined by lot quality assurance sampling method.

Lots	Weight Immunization Coverage			
	BCG	Measles	Drop out	% of children
Studied	(%)	(%)	(%)	Fully vaccinated (95% CI)*
13	94.67	86.01	8.66	86.01 (88.42 % - 83.59 %)

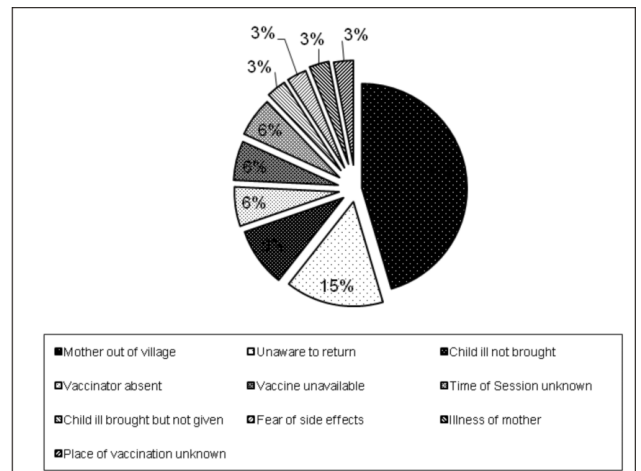
* 95 % Confidence Interval

In case of individual vaccines, all the Subcentres had acceptable vaccination coverage for BCG. Four Subcentres were identified with low coverage for measles vaccine (Table 3). Figure 1 shows various reasons for immunization failure in the lots studied. In case of, 46 % children the mother was out of village on the scheduled day of vaccination. 15 % parents said that they were unaware to return for the next dose. The child was ill but was not brought for vaccination in 9 % study subjects. The other less contributory reasons were vaccinator absent, vaccine unavailable, time of session unknown, fear of side effects, illness of mother and place of vaccination unknown.

Table 3: Detail of lot quality assurance sample survey for coverage of each vaccine

No. of Lots	No. of Children per lot	Total children studied	No. of lots identified for Low coverage<%			
			BCG	OPV/DPT	MEASLES	FI*
13	26	338	0	1	4	4

<% Decision Value-3 (FI*- Full immunization)

**Fig. 1. Pie chart showing the reasons for immunization failure**

DISCUSSION

LQAS method requires only a small sample size and easier to use, it is feasible & economical ^[16] for routine monitoring of vaccination coverage by medical officers at PHC. The present study helped us to identify that in 4 lots /Subcentres the coverage was low. Hence this technique was useful in identifying the 'unsatisfactory' pockets in the PHC, when the overall coverage was satisfactory (86.01%). This will help the local managers to initiate appropriate corrective action since the overall coverage value may mask these low coverage areas. In a study by Sarvanam Sivakumar ^[22] and et.al, LQAS method was used to estimate the measles vaccination coverage in 6 subcenters of a PHC in Tamil Nadu. They found 2 subcenters had low coverage of less than 95 %.

The dropout rate of 8.66 % was low compared with national figures. ^[13] The high level of BCG vaccination coverage indicated that immunization services were universally accessible & acceptable. However the dropout rate in the present study and also reported by other studies ^[4, 17] helped us to direct the interventions like awareness campaign on immunization in the low coverage areas.

The major reasons for immunization failure were mother out of village on the day of vaccination followed by unaware to return for next dose. Families should be educated to understand the need for timely immunization and hence we undertook IEC activities in all the 3 PHC's with the help of Anganwadi workers and Village Panchayat leaders.

CONCLUSION

The lot quality assurance survey method used to assess the coverage of vaccinations in the sampled villages of PHC helped us to identify the areas with low coverage and poor quality of immunization services. This information helped to take timely corrective action to improve vaccination coverage in the 3 PHC's. Hence coverage levels are therefore a key process indicator of performance^[18]. Operational units with poorer coverage should be identified to improve the performance.

LQAS can be applied by local health personnel/ medical officer to focus more on these areas with targeted interventions based on study findings. This study focuses the practical value of LQAS technique to public health administrator in a population which has high overall coverage, where the need is to identify small areas or pockets within the area where immunization coverage is deficient. It has the potential to monitor health programs on a routine basis in small population sub-units, especially in areas with high and heterogeneously distributed immunization coverage.^[19, 20] It can be used as a tool to identify problematic subareas to initiate action on priority basis and should not go unidentified when the overall coverage is high as reported^[20].

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Anemia among Adolescent Girls in Tribal Area of Visakhapatnam District in Andhra Pradesh

Amarnath M¹, N Lakshmanrao²

¹Associate Professor, Department of Community Medicine, ²lecturer in Statistics, Department of Community Medicine, G S L Medical College, Rajahmundry, Andhra Pradesh

ABSTRACT

Introduction: Prevalence of anemia is more than 60% among all vulnerable groups and may be much higher among adolescent girls. In tribal areas, this problem is much higher because of malnutrition, infections, and lack of sufficient knowledge regarding this problem.

Objectives:

- To study overall prevalence and epidemiological determinants of anemia among adolescent girls
- To compare levels of nutritional anemia among different age groups
- To recommended measures for prevention and control of anemia

Methodology: Cross-sectional study conducted in Tribal area of Visakhapatnam district. Sample size of 270 was selected by random sampling. Household survey was conducted to note Heights, Weights, and for Hemoglobin estimation along other epidemiological data. Hemoglobin estimation was done with Sahli's method. Diet survey was conducted in 1/5th of sample i.e. among 54 adolescent girls to know intake of iron and energy.

Results: About 88.9% of adolescent girls are anemic in them 17.8 are severely anemic. The mean hemoglobin content is 9.78gms/dl. Highest prevalence was seen in the age group of 12-13 and 14-15 years of age group that is 85% and 86.5% respectively. About 53.6% of adolescent girls gave history of passage of worms in stool. 2/3rds of adolescent girls iron in take is <10 mg/day. About 44.5% of adolescent girls have intake of 1000-1500 kcls of energy.

Keywords: Anemia, Hemoglobin, Adolescent, Tribal

INTRODUCTION

Adolescents constitute 25% of Indian population. Nutritional anemia is one of the India's public health problems among adolescent girls. The prevalence anemia is more than 60% among adolescent girls and about 1-2% are severely anemic ¹. Adolescent's health and nutrition are important issues,

which have not received the attention it deserves in our country ². Adolescence is a period of rapid growth, weight gain and blood volume expansion. The requirement of iron increases during puberty, menstrual loss of iron, parasitic infections aggravates the problem during this period³. There are direct links between poverty and adolescent girl's health. This age group is deprived of their basic rights to health, education, development, and independence. In adolescent girls anemia decreases capacity to do physical work, reduces concentration and school performance, affect growth, and does not prepare them adequately for mother hood. This is more relevant in tribal and rural adolescent girls where hard physical labor continuous to be an important source of lively hood ^{4,5}. Hence, it is very important to prevent anemia

Corresponding author:

M Amarnath

Associate Professor

Department of Community Medicine

G S L Medical College

Rajahmundry, AP

Mobile: 9848073447

Email: amaranth_m@aol.in

to provide healthy citizens to nation. Keeping all the above-mentioned facts in mind and paucity of studies conducted in Tribal areas of North Coastal Andhra the present study was conducted with the following objectives

- To study overall prevalence and epidemiological determinants of anemia among adolescent girls
- To compare levels of nutritional anemia among different age groups
- To recommended measures for prevention and control of anemia

METHODOLOGY

It's a Cross-sectional and observational study conducted in Tribal area of Visakhapatnam district. NFHS- 3 data for anemia for adolescent girls was about 55%. So 60% was taken for the purpose of calculation of simple size with allowable error of 10% for the present study.

$$\text{Sample size} = 4Pq / L^2$$

Where P = Prevalence

$$q = 100 - P$$

$$L = 10\% \text{ of } P$$

$$\frac{4 \times 60 \times 40}{6 \times 6} = 266.6 \text{ (267)}$$

Sample size=267 adolescents subjects.

One PHC in tribal area (Minumaluru) was selected by lottery method and one sub centre (Devapuram) was selected by simple random sampling. Devapuram sub-centre village was covered completely to get a sample of 270 girls in that area. Dietary intake was assessed in sub sample of 54 adolescent girls (20%) in that area

ELIGIBILITY

- 1) Willingness of adolescent girls to participate in the study.
- 2) Non-pregnant adolescent girls
- 3) No history of sickle cell anemia

Definition of anemia for the purpose of study

The Hemoglobin level <12gms/dl was taken as cut-off point for defining anemia in this study. The Hemoglobin level <8gms/dl as severe, 8-9gms/dl as moderate and 10-12 as mild was taken as criteria for defining various grades of anemia

METHODOLOGY

Household survey was conducted in that village of tribal sub-centre. An enumeration list of adolescent girls in the age group of 10-19 years was made. A pre-tested, pre-coded questionnaire schedule was used to carry out the study. Adolescent girls who were attending the schools were examined on the holidays. The girls who were not attending the schools were covered by domiciliary visits. Socio demographic information of the girls, her family, menstrual history and history of illness was collected. Socio-economic status of the family was assessed by their family Ration Cards given by State Government. Nutritional Status of the adolescent girls was assessed by the following criteria.

Height: It was measured by using a non-stretchable measuring tape. The subject was asked to stand without footwear on a flat surface against the wall with feet parallel and with heels, buttocks, shoulders and back of the head touching the upright. The height was recorded to the nearest one centimeter.

Weight: It was recorded by using bathroom scale. Zero error was checked for and removed if present. Weight was recorded to nearest 500gms.

Hemoglobin Estimation: It was done using Sahli's method. Fill the Hb calibrated tube up to the mark 20 with N/10 H cl by means of a dropper. Fill the Hb pipette exactly up to 20 cu mm by gentle and controlled sucking. Empty the pipette into acid in the tube by keeping the point of the pipette to the bottom of the tube and gently blowing of the blood without causing bubbles. Mix the acid hematin solution in the tube with gloss rod and allow the tube to stand for 10 minutes. Now dilute the solution by adding distilled water drop by drop, stirring the mixture all the time with gloss rod. The comparator is held against good day light and addition of water is continued till the color of the solution matches perfectly with that of standards. Take the reading in gm%.

Dietary intake: It was assessed by 24 hours recall method⁶. Care was taken to avoid fasting and festival days. The nutrition intake was calculated by using tables of NUTRITIVE VALUE OF INDIAN FOODS (Gopalan 1999).

Clinical Examination: All the girls were clinically examined for the signs of Nutritional anemia as well as for systemic illnesses.

Data collection technique: Data was collected by interview method.

Statistical analysis: Data was analyzed by using MS- Excel 2007.

RESULTS

In present study about 64% of the families were low socio-economic status, 30% of adolescent girls were illiterates, only 1-2% of girls completed intermediate .Only 7% of girls had knowledge about diet and nutrition. About 19.6% of adolescent girls gave past history of Malaria and about 54% of them were engaged in household work or labor before the age of 15 years, 88.9% in tribal area were anemic. Among them 17.8% were severely anemic (Tab-1). The mean hemoglobin levels were 9.78gms/dl and with Standard deviation of 2.44.

Table 1. Prevalence of anemia in study populations

Hemoglobin levels	Type of Anemia	Frequency & Prevalence
<12gms/dl	Severe Anemia	48(17.8%)
	Moderate Anemia	113(41.9%)
	Mild Anemia	79(29.2%)
>12gms/dl	Not anemic	30(11.1%)
Total		270(100%)

The above table shows that 88.9% in tribal area were anemic. Among them 17.8% were severely anemic (Tab-1).

Table: 2 Age wise distribution of anemia

Age group	Severe Anemia	Moderate Anemia	Mild Anemia	Not Anemic	Total
10 – 11	4	5	7	0	16 (5.9%)
12 – 13	27	32	5	10	74 (27.4%)
14 – 15	7	35	21	11	74 (27.4%)
16 – 17	5	25	22	6	58 (21.6%)
18 – 19	5	16	24	3	48 (17.7%)
TOTAL :	48 (17.8)	113 (41.9)	79 (29.2)	30 (11.1)	270 (100%)

Table2 depicts highest prevalence among 12-13 years age group (85%) followed by 14-15 years age group

Table 3. History of Passage of Worms in Stool

History of passage of worms	Severe Anemia	Moderate Anemia	Mild Anemia	Not Anemic	Total
Yes	29 (60.4)	65 (57.5)	46 (58.2)	12 (40.0)	152 (56.3%)
No	19 (39.6)	48 (42.5)	33 (41.8)	18 (60.0)	118 (43.7%)
Total	48 (100)	113 (100)	79 (100)	30 (100)	270 (100%)

$\chi^2=3.75$, df=3, $p>0.05$

Table3 depicts that 56.3% of adolescent girls gave the history of passage of worms in the stools, among them 60.4% were severely anemic, 57.5% were moderately anemic and 58.2% were mildly anemic and the association was found be statistically not significant ($p>0.05$).

Table 4. Iron Intake and Nutritional Anaemia

IRON NTAKE/ IDAY	Severe Anemia	Moderate Anemia	Mild Anemia	Not Anemic	Total
<10 mg	8(72.7)	12 (57.1)	9(52.9)	4(80.0)	33 (61.1%)
>10 mg	3(27.3)	9(42.9)	8 (47.1)	1(20.0)	21 (38.9%)
Total	11 (100)	21 (100)	17(100)	5 (100)	54 (100%)

$\chi^2=13.12$, df=3, $P<0.01$

Table 4 depicts that, there was a significant association between iron intake and severity of anemia ($p<0.01$)

Table 5. Calorie Intake and Nutritional Anaemia

Calorie NTAKE/ (in k.cal)	Severe Anemia	Moderate Anemia	Mild Anemia	Not Anemic	Total
<1000	3 (27.3)	6 (28.6)	5 (29.4)	0	14 (25.9%)
1000-1500	8 (72.7)	11 (52.4)	2 (11.8)	3(60.0)	24(44.4%)
1500-2000	0	4(19.0)	10 (58.8)	1(20.0)	15 (27.8%)
>2000	0	0	0	1 (100)	1 (1.9%)
Total	11 (100)	21 (100)	17 (100)	5(100)	54 (100%)

$\chi^2=21.73$, df= 9, $p<0.01$

Table5 depicts that 44.4% had calorie intake of 1000-1500 Kcals/ day .The mean calorie intake was found 1005 Kcal/day. The association between calorie intake and hemoglobin levels were found significant ($p<0.01$).

DISCUSSION

About 29.4% of Adolescent girls in our study area were illiterate's .Only 1.2% of girls completed 10+2 standard education. NFHS-3¹ data shows a prevalence

of >55% .In our studies almost 89% of adolescent girls were anemic, in that about 18% are severely anemic. Highest prevalence was reported i.e. 85%-87% in the age group of 12-15 years of age. V.G. Rao, et al⁷, (2002) reported 86.5% of anemia among adolescent girls in tribal areas of Madhya Pradesh. He reported prevalence of severe anemia 4%, moderate 58.1% and mild anemia 24.4%..This was concurrence with our results. T.Sahu et.al⁸ reported prevalence of almost 99% of anaemia in the age group of children 5-14 years and in them 4% are with severe anemia. Prevalence of mild, moderate and severe anemia was higher among those who have history of passage of worms in stools when compared with girls who did not give history of passage of worms. The difference was not significant as $p < 0.05$. V.G. Rao (2002) reported prevalence of intestinal parasitism in tribal area of Madhya Pradesh was 57.0%. These results are coinciding with our study results. Among severely anaemic, 72.7% of the adolescent girls have iron intake <10gms/day. The association between iron intake and hemoglobin levels found statistically significant. About 44.4% of adolescent girl's had calorie intake of 1000-1500 k.cal/day. The association between calorie intake and hemoglobin levels were found statistically significant as $p < 0.01$. The main limitations of the study are the study was conducted in only one randomly selected sub-centre in RHC (Simhachalam) and one randomly selected sub-centre in tribal PHC (Minumuluru), Iron estimation could not be done which is a good indicator of iron deficiency. Hemoglobin estimation was done with Sahli's method, which is not a gold standard method¹⁵. The diet survey was done only in sub-sample of the study population.

CONCLUSIONS

Nutritional anemia is one of the key determinants of the quality of human resources everywhere. The basic cause of these deficiencies is lack of adequate intake through the diets, compounded by poor bioavailability as in the case of iron. Other environmental factors such as parasitic infestation and chronic infections aggravate the deficiencies by impairing absorption and increasing the requirements. In most countries, adolescent girls face more limited access to education as well as restricted economic opportunities. In addition, they are at greater risk of under-nutrition because of heavy work and the demand of growth, demands of pregnancy, menstrual blood loss and parasitic infestation. Hence, prevention of anemia in general and in particular in adolescence

is most important to increase national productivity .All the adolescent girls in Tribal areas should be motivated and mobilized for literacy and for higher education. Proper implementation of programs meant for sustainable development of population living below poverty line. Regular checkups for adolescent girls must be provided through ICDS and RCH program.

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Rural and Urban Variations in Prevalence of Anemia among Adolescent Girls in Visakhapatnam District, Andhra Pradesh

Amarnath M¹, N Lakshmana Rao²

¹Associate Professor, ²Lecturer in Statistics, Department of Community Medicine, G S L Medical College, Rajahmundry

ABSTRACT

Introduction: Anemia is still a public health problem in India. The vulnerable groups for Anemia are children, adolescent girls, pregnant and lactating mothers. Anemic children show poorer attention span, memory and concentration leading to poor school performance. Among adolescent girls anemia decreases the capacity to do physical work, affects growth and does not prepare them adequately for mother hood.

Objectives:

- To know the prevalence of anemia in adolescent girls (10-19) in rural, urban areas of Visakhapatnam district.
- To find out epidemiological determinants of Anemia among adolescent girls.
- To compare the hemoglobin levels of adolescent girls in rural, urban slum areas of Visakhapatnam district.

Methodology: Cross-sectional study conducted in Rural and Urban slum area of Visakhapatnam district. Sample size of 540 was selected by random sampling. Household survey was conducted to note Heights, Weights, and for Hb estimation along other epidemiological data. Hemoglobin estimation was done with Sahli's method. Diet survey was done with 1/5 th of sample i.e. among 54 adolescents in each area to know intake of iron and energy.

Results: About 95.5% of adolescent girls in rural area and in urban area 81.5% are anemic. Highest prevalence was seen in the 14-15 years of age group. About 45.9% of adolescent girls in rural area and 21.5% in urban slum gave history of passage of worms in stool. In rural area 58.9%, in urban area 38.1% of girls were with BMI<18.5. In rural area the mean intake of iron 11.9mg/day and in urban area it was 10.5mgs/day. Mean Calorie intake was found 1111K.Cal/day in rural area, 1028K.Cal/day in urban area.

Keywords: Anemia, Hemoglobin, Adolescent, Rural, Urban

INTRODUCTION

Health is center of socio-economic development. Having more number of people in productive age group is bonus for socio-economic development of India. Nutritional Anemia badly effects physical and mental development¹. It is particularly severe among pregnant women, lactating mothers, adolescent girls and preschool age children. Adolescence comes from the term Adolescere meaning to grow up. In this period not only the physical but also psychological and behavioral changes takes place. During this phase, diet

should provide not only sufficient calories but also essential elements and nutrients required for growth (Proteins, Vitamins and Minerals). In minerals iron is very important element required for increasing RBC mass and myoglobin. Girls of this age group need additional 15% iron as menstruation begins². Anemia may be caused not only by a deficiency of iron but by other conditions like Malaria, Hookworm, Schistosomiasis and other infections. Congenital hemolytic diseases such as Sickle – Cell anemia and Thalassemia play an important role in tropical

climates³. 1991-2000 A.D. was declared as SAARC decade for girl health. There are direct links between poverty and adolescent girl's health. This age group deprived of their basic rights to health, education, development and independence. In adolescent girls, Anemia decreases the capacity to do physical work, reduces concentration and school performance, affects growth and does not prepare them adequately for mother hood. This is more relevant in rural and urban slum areas of developing countries where hard physical labor continues to be an important source of livelihood^{3,4}. Hence, it is very important to prevent Anemia to provide healthy citizens to the nation. Keeping all the above-mentioned facts in mind and paucity of studies conducted in North Coastal Andhra Pradesh, the present study was carried out with the following objectives.

- To know the prevalence of anemia in adolescent girls (10-19) in rural, urban areas of Visakhapatnam district.
- To find out the epidemiological determinants of Anemia in adolescent girls.
- To compare the hemoglobin levels of adolescent girls in rural, urban areas of Visakhapatnam district.

METHODOLOGY

The present study was cross-sectional, observational study undertaken to find out the prevalence of Nutritional anemia among adolescent girls (10-19 years). The study was conducted in the two selective areas of Visakhapatnam district, One in Rural area (RHC, Simhachalam), one in urban slum area (Rellivedhi). NFHS -3 data for A.P. shows prevalence of 55% of anemia among adolescent girls (15-19 years)⁴. So, Prevalence of 60% anemia among adolescent girls was taken for the purpose of calculation of sample size.

$$\text{Sample size} = 4Pq / L^2$$

Where P = Prevalence

$$q = 100 - P$$

$$L = 10\% \text{ of } P$$

$$4 \times 60 \times 40$$

$$\frac{\quad}{6 \times 6} = 266.6 \text{ (267)}$$

$$6 \times 6$$

The sample size comprised of 540 adolescent girls includes 270 in Rural and 270 in urban area. RHC Simhachalam in rural area and Relliveedi ward in Visakhapatnam urban slum area were selected by selective sampling method. In these areas the selection of sub-centers in Rural and Wards in Urban slums was done by simple random sampling method. In RHC Simhachalam, Sattivanipalem sub-centre was randomly selected. The villages Sattivanipalem, K. Narava and Jaggannapeta were covered to get a sample of 270 adolescent girls. In urban slum area relliveedi slum was randomly selected for the study. The Relliveedi slum was covered to get a sample of 270 adolescent girls. Complete enumeration of adolescent girls of the three villages in sub-centre of Simhachalam (RHC), one urban slum (Rellivedhi) was conducted. The inclusion criteria for the girls is willingness of adolescent girls to participate in the study, non-pregnant adolescent girls and not having any history of sickle cell anemia. The Hemoglobin level <12gms/dl was taken as cut-off point for defining anemia in this study. The Hemoglobin level <8gms/dl as severe, 8-9gms/dl as moderate and 10-12 as mild was taken as criteria for defining various grades of anemia. Household survey was conducted in all the three villages of sub-centre in RHC and randomly selected ward of Visakhapatnam city. An enumeration list of adolescent girls in the age group of 10-19 years was made. Pre-tested, pre-coded, schedules were used to carry out the study. Adolescent girls who were attending the schools were examined on the holidays. The girls who were not attending the schools were covered by domiciliary visits. Socio demographic information of the girls and her family, menstrual history, history of illness was collected. Socio economic status of the family was assessed by their family Ration Cards given by State Government. Nutritional Status of the adolescent girls was assessed by the following criteria. Height was measured by using a non-stretchable measuring tape. The subject was asked to stand without footwear on a flat surface against the wall with feet parallel and with heels, buttocks, shoulders and back of the head touching the upright. The height was recorded to the nearest one centimeter. Weight was recorded by using bathroom scale. Zero error was checked for and removed if present. Weight was recorded to nearest 500gms. Hemoglobin estimation was done using Sahli's method. Fill the Hb calibrated tube up to the mark 20 with N/10 Hcl by means of a dropper. Fill the Hb pipette exactly up to

20 cu.mm by gentle and controlled sucking. Empty the pipette into acid in the tube by keeping the point of the pipette to the bottom of the tube and gently blowing of the blood without causing bubbles. Mix the acid haematin solution in the tube with glass rod and allow the tube to stand for 10 minutes. Now dilute the solution by adding distilled water drop by drop, stirring the mixture all the time with glass rod. The comparator is held against good day light and addition of water is continued till the color of the solution matches perfectly with that of standards and takes the reading in gm%. Dietary intake was assessed by 24 hours recall method. Care was taken to avoid fasting and festival days. The nutrition intake was calculated by using tables of NUTRITIVE VALUE OF INDIAN FOODS (Gopalan 1999). All the girls were clinically examined for signs of Nutritional anemia as well as for systemic illnesses. Data was collected by interview method and analysis with χ^2 test, t-test, means and proportions.

RESULTS

Table 1. Nutritional Anaemia by Type of Area

Type of area	Anemic	Not Anemic	Total
Rural(n=270)	258 (95.5%)	12 (4.5%)	270 (100%)
Urban slum(n=270)	220 (81.5%)	50 (18.5%)	270 (100%)
Total	478	62	540

$\chi^2=28.34$ $p < 0.0001$

Table-1 reveals that, the prevalence of anemia was found 95.5% in rural area includes 8.9% severe, 45.1% moderate and 41.5% mild anemia. In urban slum area the prevalence was 81.5%, with 10% severe, 20.4% moderate and 51.1% mild anemia. The association between anemia and the type of area was found statistically significant as $p < 0.0001$

Table 2. History of Passage of Worms in Stool and Anemia

Type of area	Severe Anemia	Moderate Anemia	Mild Anemia	Not Anemic	Total
Rural(n=270)	13(10.5%)	69(55.6%)	39(31.5%)	3(2.4%)	124/270
Urban slum(n=270)	8(13.8%)	17(29.3%)	31(53.4%)	2(3.5%)	58/270
Total(n=540)	21	86	70	5	182/540

Table-2 reveals that, 45.9 % of adolescent girls in rural area gave history of worm infestation, of them 97.6% were anemic and among them 10.5% were severely anemic. About 21.5% of the adolescent girls in the urban slum gave the history of passage of worms in the stools, among them 96.5% were anemic and 13.8% were severely anemic.

Table 3. BMI (<18.5) and Anemia

Severity of Anemia Type of area	Severe Anemia	Moderate Anemia	Mild Anemia	Not Anemic	Total
Rural(n=270)	18(11.3%)	73(45.9%)	65(40.9%)	3(1.9%)	159/270
Urban slum(n=270)	15(14.6%)	21(20.4%)	55(53.4%)	12(11.6%)	103/270
Total(n=540)	33	94	120	15	262/540

Table-3 reveals that, about 58.9% of girls in rural area were with BMI <18.5, among them 98.1% were anemic with 11.3% of severely anemic girls. In urban slum area 38.1% of girls were with BMI<18.5, among 88.4% were anemic with 14.6% severely anemic adolescent girls.

Table 4. Mean Hemoglobin levels in study area

Type of area	Mean(gms/dl)	S.D
Rural(n=270)	9.80	1.4
Urban slum(n=270)	11.03	2.19

Table-4 shows that, there was no statistical significance ($p > 0.05$) difference in Hemoglobin levels between rural and urban slum area. The mean Hemoglobin level was found to be more in (11.03gms/dl) urban slum area when compared to rural area.

Table 5. Mean Intake of Iron and Calories/Day

Type of area(n=108)	IRON	CALORIES
Rural(n=54)	11.9mgs	1111 K. Cals
Urban slum(n=54)	10.5mgs	1028 K. Cals

Table-5 reveals that, among rural adolescent girls the mean intake of iron was found to be 11.9 mg/day. Among urban adolescent girls mean iron intake was 10.5 mg/day. The mean intake of calories in rural area found to be 1,111 K. Cal./day. The mean intake Calories in urban area was found as 1028 K. Cal./day.

DISCUSSION

In the present study, the prevalence of anemia was found 95.5% in rural area that includes 8.9% severely anemic adolescent girls. In urban slum area prevalence of anemia was found 81.5% with 10% severe anemia. Maximum prevalence was found in the age group of 14-15 years i.e. 97.8% in rural area and 84.6% in urban area. From this, it may be concluded that higher prevalence of anemia may be due to menarche, increased demand and exhaustion of iron stores. Choudhary et.al., reported prevalence of anemia as 30.74% among adolescent girls in rural area of Varanasi(UP)⁵. Rawat et al., reported that the prevalence of anemia among adolescent girls was

found to be 34.5 percent⁶. These are less than that seen in our study. These results are not coinciding with this study results. Saibaba et al., reported 88% of prevalence of anemia among adolescent girls in Hyderabad and Secunderabad slum areas. He reported 7.9% of severe, 31.3% moderate and 49.0% of mild anemia⁷. These results were coinciding with the present study.

About 45.9 % of adolescent girls in rural area gave history of worm infestation, of them 97.6% were anemic and 21.5% of the adolescent girls in the urban slum gave the history of passage of worms in the stools, of them 96.6% adolescent girls were anemic. Relatively higher prevalence of anemia was observed in those with worm infestation. Tripathi et al., reported more than one-third (39%) adolescent girls of Lucknow had history of passing worms⁸. Sampath Kumar, et al., reported in their study that 63% of adolescent girls have worm infestation in rural Tamil Nadu⁹. This value is much higher what we observed in the present study.

About 58.9% of girls in rural area were with BMI <18.5, among them 98.1% were anemic and 38.1% of girls in urban slum area were with BMI <18.5, among them 88.4% were anemic. Verma et al., reported 82.4% of anemia in those with BMI<18.5 in slum area of Ahmadabad city¹⁰. These results are coinciding with the present study results. The mean intake of iron was found to be 11.9 mg/day among rural adolescent girls. Among urban adolescent girls mean iron intake was found 10.5 mg/day. Raheena Beegum reported that mean intake of iron was 14.10 mg /day among adolescent girls in rural Kerala¹¹. These results are not coinciding with our study results. The mean intake of calories in rural area found to be 1,111 K. Cal./day and in urban area mean intake of calories was found as 1028 K. Cal./day. Raheena Beegum reported mean intake of calories was 1,451 K.Cal./day in rural Kerala among adolescent girls¹¹. Saibaba, et al., reported mean intake of Calorie as 1600 K Cal. / day among adolescent girls in slum area of Hyderabad city⁷. These results are much higher than what we observed in the present study.

The main limitations of this study are the study was conducted in only one randomly selected sub-centre in RHC (Simhachalam) and one randomly selected Urban area(Rellivedi) Iron estimation could not be done which is a good indicator of iron deficiency. Hemoglobin estimation was done with Sahli's

method, which is not a gold standard method¹². The diet survey was done only in sub-sample of the study population.

CONCLUSIONS AND RECOMMENDECTIONS

Health is a key determinant of socio-economic development. In India the factors like malnutrition and infections are badly affecting the quality of life. The main causes are lack of adequate intake through the diets, poor bioavailability iron and other micronutrients. Other environmental factors such as parasitic infestations and chronic infections aggravate the deficiencies by impairing absorption and increasing the requirements. In our country, adolescent girls face more limited access to education as well as restricted economic opportunities. In addition, they are at greater risk of under-nutrition because of heavy work and the demand of growth, demands of pregnancy, menstrual blood loss and parasitic infestation. Hence, prevention of anemia in general and in particular in adolescence is most important to increase national productivity. All the adolescent girls in Rural and Urban slum areas should be motivated and mobilized for literacy and for higher education. Proper implementation of programs meant for sustainable development of population living below poverty line. Regular checkups for adolescent girls must be provided through ICDS and RCH program.

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A Study of Correlation of Anthropometric Measurements to the Status of Anemia in School Children

Amirul Hassan¹, Ritu Jain², Maroof Ahmad Khan³

¹Associate Professor, Department of Community Medicine, Motilal Nehru Medical College, Allahabad, ²Head of the Department of Neonatology, Kamla Nehru Memorial Hospital, Allahabad, ³Lecturer in Bio-statistics, Department of Community Medicine, Motilal Nehru Medical College, Allahabad

ABSTRACT

Most of the school children suffer from anemia, but the good thing is that majority of them having easily treatable anemia i.e. Iron deficiency anemia and it is estimated to affect one - half of school age children in developing countries. The school years are opportune time to intervene.

No coherent, coordinated and effective health services are available in country for below 16 years. So attempt was made to know real scenario of status of anemia and its relationship with the anthropometric measurements. The present study was carried to know prevalence of anemia and its relationship with the anthropometry. A Community based study carried out in 363 school children, 5-15 years age in peri-urban and slum areas of Allahabad for six months and simple random sampling method adopted. Weight and Height were measured by using standard procedure. Hemoglobin was measured by Hemokwik hemoglobin color scale. Z-score at -2SD was taken as cut-off point for stunting. Data analyzed with help of statistical software. Out of 363 subjects, 66.1% were males, 33.9% females, mean age, height weight, BMI and Hemoglobin were 9.67 ± 2.87 , 125.99 ± 16.64 , 25 ± 9.53 , 15.26 ± 2.33 , 9.97 ± 1.08 respectively, 95% were anemic, 70.25% were stunted (< -2 Z-score) and 10.7% were severely stunted (< -3 Z-score). Hemoglobin level is directly related to mean height and weight, as hemoglobin decreases mean height(h) and weight (w) decreases, $r^h = 0.211$, correlation is significant at 0.01 level and $r^w = 0.235$ correlation is significant at 0.05 level respectively, ANOVA shows p-value 0.052, frequent episode of infection is correlated to stunting, $r_s = 0.32$, significant at 0.01 level, Hemoglobin level correlate to chest circumference(cc) and growth retardation(gr), $r^{cc} = 0.199$ and $r^{gr} = -0.198$, both are significant at 0.05 level. Thus it is concluded that anthropometry to be the most sensitive parameter for the anemia in school children.

Keywords: Anthropometry, Anemia, Z-Score, Stunting

INTRODUCTION

School children form an important vulnerable segment of population and constitute about 20 per cent of total population of India. School age is a dynamic period of growth and development as children undergo physical, mental, emotional and social changes during this stage¹. Under five years old children are targeted for priority care under various maternal and child health programmes, but those above this age group including the age group when the growth spurt takes place, remains a neglected lot. No coherent coordinated and effective health service is available in the country for this group of school going children. The school year is an opportune time to intervene; interventions must be based on sound

epidemiologic understanding of the problem. Anthropometry has been considered to be the most sensitive parameter for the assessment of nutritional status of the community especially the growing children. So the present study has been carried out with the following objectives:-

- (i) To assess the prevalence of anemia in school going children of periurban and slums.
- (ii) To know relationship with the anthropometric measurements and anemic status of school children

MATERIAL & METHOD

A community based cross sectional study was carried out in 363 school children of the age group of

5-15 years in peri-urban and slum areas of Allahabad city for a period of six months. The subjects were chosen by simple random sampling method from various areas of the city. A pre-designed and pre-tested questionnaire was filled after taking a written consent on informed consent forms by parents or caretakers. Weight and Height were measured by using standard procedure suggested by Jelliffe (1966)². Weight was measured by digital scales to within 100gms, on light clothing, bare feet and after light food. Height was measured by stadiometer to within 0.1 centimeter. Body Mass Index (BMI) was calculated and classified according to the World Health Organization (WHO)³ simplified field tables, BMI were graded as >-2 , <-2 and <-3 according to z-score. Children were considered stunted as Height for age is <-2 z-score^{3, 4}. Hemoglobin level was measured by Hemo kwik hemoglobin color scale developed by Kruise Pathline Private limited, Ahmadabad. A micro prick making in the finger and small strip containing chemical is touched to the bleeding finger, the color change is matched with the color code scale after 30 seconds, the best color matched will give the reading of Hemoglobin in g/dl and

classified according to WHO criteria⁵. The data has been collected and fed into the computer. The data analyzed with the help of statistical software SPSS version-12.

FINDINGS

Table 1. Distribution of School Children According to their Age and Anemia Status

Age Group	Anemic	Non-anemic	Total
<6	24	0	24
	6.6%	0%	6.6%
	6-9	114	0 114
31.4%	0%	31.4%	
	9-12	123	6 129
33.9%	1.7%	35.5%	
12-15	84	12	96
23.1%	3.3%	26.4%	
Total	345	18	363
	95.0%	5.0%	100.0%

Table :- (I) shows that out of three hundred and sixty three, 95% were anemic and the maximum (33.9%) were in age group of 9-12 years.

Table 2. Comparison of Mean Weight and Mean Height of School Children in Mild and Moderate Anemia

	Mild anemia	Moderate anemia	t-value	d.f.	p-value
Mean weight	26.65±10.44	21.50±6.00	2.86	361	0.05
Mean Height	129.27±18.03	118.84±10.94	3.34	361	0.001
Mean Chest circum	62.71±9.45	58.29±7.55	2.53	361	0.013

Table:- (II) shows that Anemia is directly related to mean weight, mean height and mean chest circumference. The mean weight in moderate anemic children is less than the mild anemic, similarly mean height in moderate anemic children is less than the mild anemic and they are statistically significant.

FIG:- (I)

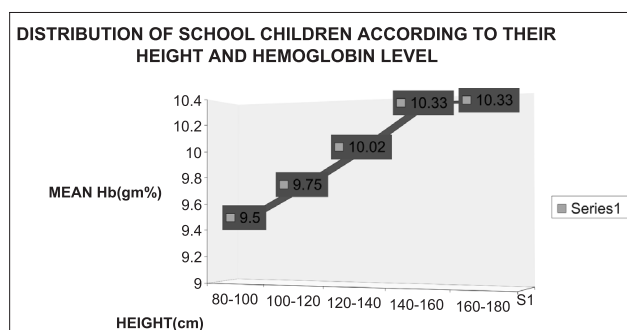


FIG:- I shows the direct relationship between the mean hemoglobin and height, Pearson's correlation test is significant at 0.01 level, $r^h=0.211$

Table 3. Distribution of School Children According to their Weight and Mean Hemoglobin

Weight (Kilogram)	N	Mean Hemoglobin (gm%)
5-15	18 (4.96%)	5.83
15-25	192 (52.89%)	8.16
25-35	99 (27.27%)	11.12
35-45	30 (8.26%)	13.80
45-55	18 (4.96%)	14.17
>55	6 (1.65%)	13.00
Total	363 (100%)	9.69

Table:- (III) shows relationship between weight and mean Hemoglobin level. There is direct relationship between weight and mean Hemoglobin level in school going children.

FIG: - (II)

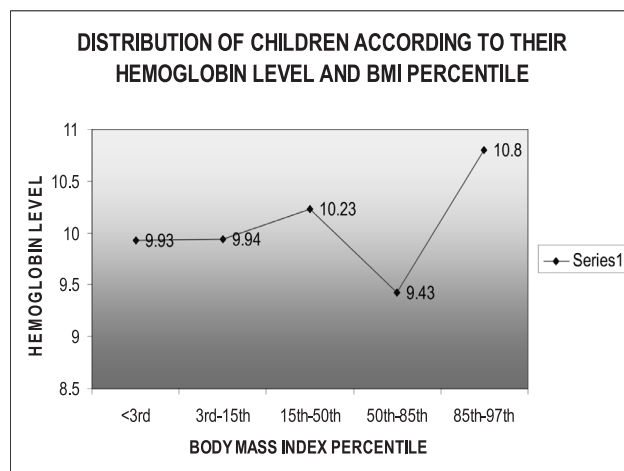


FIG:-II, shows that as the BMI percentile increases, the mean hemoglobin level increases, there is sharp dip which indicate the growth spurt period.

FIG:- (III)

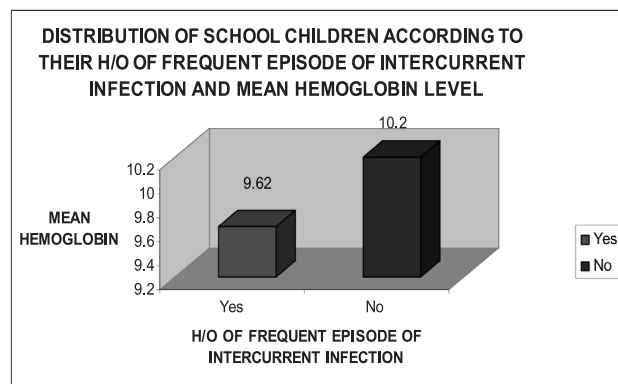


FIG:III -shows that the school children who have the H/O frequent episode of infection have low mean hemoglobin level as compare to others, this difference is statistically significant ,Chi-square value at d.f, 1 is 7.742, $p < 0.05$.

Table 4. Distribution of School Children According to Anemia and their Height for Age Ratio

Status	Height For Age Ratio				Total
	Normal (95%)	Marginal (90-95%)	Moderate (85-90%)	Severe (<85%)	
Anemic	105	105	96	39	345
	30.4%	30.4%	27.8%	11.3%	100.0%
Non-anemic	3	15	0	0	18
	16.7%	83.3%	.0%	0%	100.0%
Total	108	120	96	39	363
	29.8%	33.1%	26.4%	10.7%	100.0%

Correlation is significant at the 0.01 level (2-tailed).

Table:- (IV) shows that anemia is related to Height for age ratio, the severity of stunting is related to the anemic status of the children.

If the findings of the present study is compared to the other studies then in the present study mean hemoglobin level was 9.98gm%, 95percent were anemic which can be compare with another study⁶in which they found mean hemoglobin level 9.07gm%and 98.9 percent anemic. In this study, 32.2percent were having moderate anemia compare to other studies⁷ having moderate anemia 22.4%. In the present study mean Height in anemic individual was 118.84 ± 10.94 , this can be compare with other study⁸ in which they found 136 ± 8.8 and mean weight in anemic individual was 21.5 ± 6.00 which can be compare with other study⁸ in which it was found to be 31.8 ± 3.8 . Another study⁹ in which they found that mean height and weight in all the age group was significantly less than the National Center for Health Statistics standards. In the present study 10.7% children were found to be severely stunted which can be compare with other study⁹ in which they found 6.2% stunted children. In the present study the children who were anemic found to be stunted, this can be compare to the other study¹⁰.

CONCLUSIONS

The mean weight in moderate anemic children is less than the mild anemic , similarly mean height in moderate anemic children is less than the mild anemic and they are statistically significant .As BMI percentile increases, the mean hemoglobin level increases, the school children who have the H/O frequent episode of infection have low mean hemoglobin level as compare to others, anemia is related to Height for age ratio, the severity of stunting is related to the anemic status of the children. Thus it was concluded that anthropometry to be the most sensitive parameter for knowing the anemic status in school children. National anemia Prophylaxis program (NAPP) has been set up in all states of the country since 1970, but the benefit have not yet been appreciated in the target population, the constraints should be searched and country should be freed from the hands of anemia.

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Conflict of Interest:- No interest of conflict

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A Study on the Role of Vitamins and Minerals Supplementation in the Treatment of Tuberculosis

Amit Kr Singh¹, J B Gogoi², N C Pant³, P Mittal⁴, V Juyal⁵, S Mukherjee⁶

¹Assistant Professor, Department of Community Medicine, ²Associate Professor & HOD, Department of Biochemistry, VCSG Govt. Medical Science & Research Institute, Srikot, Srinagar (Pauri Garhwal), Uttarakhand, ³Lecturer, Global Institute of Pharmaceutical, Education & Research, Kashipur, Udham Singh Nagar, Uttarakhand, ⁴Lecturer, Dept of Pharmacy Practice, School of Pharmacy, International Medical University, No-126, Jalan Ajil Perkasa 19, Bukit Jalil, Kuala Lumpur, ⁵Professor, Dept. of Pharmaceutical Sciences, Uttarakhand Technical University, Govt Girls Polytechnic, PO-Chandanwadi, Prem Nagar, Sudhowala, Dehradun, Uttarakhand, ⁶Assistant Professor, Department of Biochemistry, VCSG Govt Medical Science & Research Institute, Srikot, Srinagar (Pauri Garhwal), Uttarakhand

ABSTRACT

Micronutrient deficiencies are thought to be the most common cause of secondary immunodeficiency and may reduce resistance to infection. The aim of this study was to compare the effect of vitamin A with Zinc and vitamin D with Calcium supplementation on sputum conversion and blood profile during the initial two months of therapy. The study was carried out in forty sputum positive pulmonary tuberculosis patients out of whom only thirty seven cases completed the study. The patients were divided into Group I (n=13) received antitubercular drugs only while group II (n=11) and group III (n=13) received vitamin D with Calcium and vitamin A with zinc respectively along with anti tubercular therapy. After two months of therapy all patients of group III become sputum negative (100%) while in group II and group I, the sputum conversion rate was 90.90% and 84.61% respectively. The two month supplementation of vitamin-A with Zinc and vitamin-D with Calcium in sputum positive pulmonary tuberculosis patients taking anti tubercular therapy complemented the recovery of patients with active tuberculosis and blood profile of these patients was also improved significantly.

Keywords: Pulmonary Tuberculosis, Vitamin, Mineral, Malnutrition, Immunity, Anti-Tubercular Therapy (ATT)

INTRODUCTION

Tuberculosis, one of the most prevalent communicable diseases, is a major health problem in developing countries. The disease usually affects the lungs although in up to one-third of cases other organs are also involved. Patients with sputum smear positive (+ve) pulmonary TB is comparatively more infectious as they produce sputum with sufficient tubercle bacilli. Patients with smear negative (-ve) pulmonary diseases are less infectious than those who are smear positive (+ve). The relative transmission rates from smear negative (-ve) with smear positive (+ve) patients has been estimated 0.22^(1,2,3). Malnutrition appears to increase the risk for tuberculosis; persons with low body mass index are greatly more at risk for tuberculosis than are those with a high index^(4,5). Vitamins and their metabolites are essential for fulfilling diverse functions as hormones and antioxidants, as regulators of tissue growth and

differentiation⁽⁶⁾. It is the most prominent risk factor for infection related morbidity which potentially effect individual's susceptibility to tuberculosis and may alter the natural course of this disease^(5,7). Vitamins influence the immune system. Impaired T cell function including decreased production of T helper-1 (TH-1) cytokines interleukin-2 and interferon- γ , have resulted from deficiencies of protein, zinc and active metabolite of vitamin D, 1,25-dihydroxy vitamin D₃ (Calciferol)^(4,8). Vitamin A and D and zinc deficiency has been commonly observed in patients with tuberculosis. The deficiency of Vitamin A and D observed in patients with tuberculosis might have contributed to the development of tuberculosis disease in them. Prevalence of tuberculosis is higher in Asian and elderly as most of them have low serum 25-hydroxy cholecalciferol^(9, 10, 11,12,13). Vitamin D modulation of macrophage function can activate human antimicrobial activity in patient with TB; external production of 1, 25-(OH)₂ D by activated T

lymphocytes at the granulomatous site or in the peripheral blood may improve the ability of macrophage to inhibit the growth of micro bacteria⁽¹⁴⁾.

Vitamin A deficiency is associated with many infectious diseases. This indicates an association with vitamin A deficiency and tuberculosis. Zinc deficiency could impose a secondary vitamin A deficiency. Addition of small amounts of vitamin A enhanced the T cell proliferative response⁽¹⁵⁾.

MATERIALS & METHOD

The present study was conducted in the HNB hospital attached to the Veer Chandra Singh Garhwali Govt. Medical Science and Research Institute, Srinagar – Pauri Garhwal (Uttarakhand).

This study was designed to compare the effect of vitamin A with Zinc and vitamin D with Calcium supplementation on sputum conversion during the initial two months of antitubercular therapy (ATT). The inclusion criterion for this study was newly diagnosed sputum smear positive pulmonary tuberculosis patients taking not more than 7 days treatment of ATT with age range from 18-60 years. The exclusion criteria were known history of drug resistance tuberculosis and renal diseases.

Sample Size: Total forty (40) patients were enrolled in this study who were diagnosed positive in the month of Sept – Oct 2010 and they were randomly divided into three groups; group I received antitubercular drugs only while group II and III received vitamin D with Calcium and vitamin A with zinc respectively along with ATT. Out of forty (40) only thirty seven (37) patients completed the study. Three (03) patients were excluded from the study because there compliance was not good during the study period.

Study Period: Six months (1st Oct 2010 to 31st Mar 2011)

STUDY METHOD

Micronutrients and vitamin supplementation

Zinc capsules containing 50 mg elemental Zinc as Zinc sulphate, vitamin A capsule containing 25000 IU of vitamin A as Vitamin A palmitate and vitamin D with Calcium tablets containing 250 IU of vitamin D₃

and 500 mg Calcium as Calcium carbonate were supplemented. The group I patients received only ATT (considered as control). The group II patients were asked to take one tablet of vitamin D with Calcium for first 10 days, then three capsules in a week while group III patients were asked to take one capsule of vitamin A and Zinc tablet for first 10 days and then three tablets in a week.

Sputum Sample collection

The sputum sample was collected and examined on the day of enrollment in the study. Then the patients were asked to visit the clinic in every 20th day for sputum testing. At the time of enrollment, blood sample (5ml) was taken to estimate the serum Hb concentration, DLC, AST and ALT. The body weight of the patients was also measured. The second blood sample was taken after two months and weight was also measured at that time.

RESULTS & FINDINGS

Table 1. Sputum conversion rate in the initial two months of therapy

Days	Group-I (n=13) (in percentage)	Group-II (n=11) (in percentage)	Group-III (n=13) (in percentage)
20th day	23.07	45.45	61.33
40th day	61.15	63.63	84.61
60th day	84.61	90.90	100

(Group-I: patients with ATT only; Group II: patients with ATT and vitamin D with Calcium; Group-III: patients with ATT and vitamin A with zinc)

Table 2: BMI (Kg/M²) values

Days	Group-I (n=13)	Group-II (n=11)	Group-III (n=13)
1 st day	17.70	16.37	17.52
60 th day	18.22	17.45	17.95

Table 3: Hemoglobin concentration (mg/dl)

Days	Group-I (n=13)	Group-II (n=11)	Group-III (n=13)
1 st day	10.34	10.32	10.48
60 th day	10.83	11.12	11.40
p	<0.05	<0.05	<0.05

Table 4: Neutrophil count (in %)

Days	Group-I (n=13)	Group-II (n=11)	Group-III (n=13)
1 st day	72	78.18	72.92
60 th day	68.23	70.78	65.92
p	<0.05	<0.05	<0.05

Table 5: Lymphocyte count (in %)

Days	Group-I (n=13)	Group-II (n=11)	Group-III (n=13)
1 st day	24.23	18.45	21.38
60 th day	28.76	25.51	28.38
p	<0.05	<0.05	<0.05

Table 6: Weight gain (in kg) during the treatment period

Days	Group-I (n=13)	Group-II (n=11)	Group-III (n=13)
1 st day	47.38	40.18	45.56
60 th day	47.53	42.68	47.11
p	<0.05	<0.05	<0.05

Table 7: Values of serum ALT and AST LEVEL (u/l)

Days	Group-I		Group-II		Group-III	
	ALT	AST	ALT	AST	ALT	AST
1 st day	27.20	24.97	32.60	27.71	35.37	30.26
60 th days	27.76	25.45	28.56	23.16	30.42	24.25
p	>0.05	>0.05	<0.05	<0.05	<0.05	<0.05

Thirty seven patients completed the study after exclusion of three subjects due to non-compliance. As shown in table-1, after three weeks of treatment, the sputum conversion in group-III and group-II were found to be 61.33% and 45.45% respectively whereas in comparison group-I it was only 23.07%. After 6 weeks of treatment it was 84.61% and 63.63% in group-III and group-II respectively while in group-I it was 61.15%. In micronutrient supplemented groups sputum conversion occurred earlier in comparison with the control group (3 weeks compared to 6 weeks; $p < 0.05$). After two months of therapy all patients of group-III become sputum negative (100%) while the sputum conversion rate was 90.90% and 84.61% respectively in group-II and group-I. Refers to ANOVA, SPSS 12 version showed the significant difference at $p < 0.05$ among these groups from 0 day to 20, 40 and 60 days. By applying pair sample test and student's t test, group-III showed the better performance than other two groups; the order was group-III then group-II and group-I respectively.

During the first week of treatment maximum patients had low BMI and were anemic. Even after two months of treatment no significant change in BMI and anemia were noticed (Table-2 and Table-3). As seen in Table-3, the increase of Hb concentration was found to be 0.49, 0.70 and 1.00 mg/dl respectively in Group I, Group II and Group III after completion of 2 months of treatment. In all three groups the Hb level was significantly increased ($p < 0.05$) after two months of treatment and the order of performance level was group-I < group-II < group-III. As per Table-4, the neutrophil count decreased in all three groups after

two months of therapy (more significantly in group-II than group-III and group-I) and according to Table-5, there was significant increase in lymphocyte count after two months of treatment (more significantly in group-III than group-II and group I). As found in Table-6, in group-I, average weight gain was 0.15 kg. Which is statistically insignificant ($p > 0.05$). The group-II and group-III patients had statistically significant weight gain after two months of treatment ($p < 0.05$ in both cases); the increased in weight were 2.5 kg and 1.55 kg respectively. As seen in Table-7, the change in ALT and AST was statistically insignificant for group-I after the initial two months of therapy ($p > 0.05$). But the changes of ALT and AST values were found to be statistically significant in both group-II and group-III ($p < 0.05$ in both cases) after two months of therapy.

DISCUSSION & CONCLUSION

The present study showed that the vitamin and mineral supplementation complemented the recovery of patients with active pulmonary tuberculosis and this effect was more remarkable after two months of therapy. Vitamin and their metabolites are essential for a large number of physiological processes, fulfilling diverse functions as hormones and antioxidant, as regulation of tissue growth and differentiation. Vitamin A and D are distinct from other vitamin in that their metabolites, retinoic acid and $1,25-(OH)_2$ vitamin D_3 have hormone like properties. The result of $1,25-(OH)_2$ vitamin D_3 action on T cells is to block the induction of T helper-1 (TH-1) cell cytokines particularly IFN, while promoting TH-2 cell response, an effect mediated both indirectly by decreasing INF production and directly by enhancing IL-4 production. The activity of $1,25-(OH)_2$ vitamin D_3 , an effector of T cell differentiation, is further enhanced by its effect as an antigen processing dendritic cells, in which it suppresses the synthesis of IL-12, a cytokine that promote TH-1 cell response. $1,25-(OH)_2$ vitamin D_3 can stimulate human monocyte proliferation in vitro and increase the production of both IL-1 and bactericidal peptide catelicidin by monocyte and macrophage.

Beta carotene supplementation in elderly men had significantly greater NK cell activity than elderly men receiving placebo¹⁶. Several *in vitro* studies showed that RA (Retinoic acid) has some immunoprotective role and D_3 /RA treatment inhibit mycobacteria entry and survival within the macrophage^(17,18). Other studies showed that vitamin-E supplementation causes early sputum conversion and micronutrient supplementation decrease the risk of TB recurrence^(19, 20).

The result of our study showed that vitamin A with Zn and vitamin D with Calcium had greater sputum conversion in first three weeks and it is similar to the findings of other few studies where Vitamin A with Zn and Vitamin D alone had greater sputum conversion than placebo or control ^(21, 22). In our study we found that there is weight gain in every group but it is more significant in vitamin and mineral supplemented groups. These findings are similar to other study which indicated 6.88 kg weight gain in multivitamin group after 7 months of therapy ⁽²³⁾. In all three groups, the Hb level was significantly increased after two months of treatment. The significant decrease in neutrophil count and significant increase in lymphocyte count had been observed in all the three groups after two months of treatment. The elevated levels of AST and ALT showed hepatotoxicity caused by ATT while the levels of these two enzymes were significantly decreased in nutrition supplemented patients and found that vitamin-A with zinc combination is more effective than vitamin-D with calcium supplementation in reducing hepatotoxicity.

The study was performed to indicate an effect of adjuvant therapy of vitamin and minerals in the treatment of tuberculosis. Our study suggests that vitamin with mineral supplementation with ATT is helpful in the control, recovery and treatment of tuberculosis. Vitamin-A with zinc combination showed better performance than vitamin-D with calcium combination.

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Conflict of Interest

Tuberculosis is one of the major disease of concern in our country and for the state of Uttarakhand. Malnutrition is the major cause of it as malnutrition causes decrease immunity of human being. The two months supplementation of vitamin-A with Zinc and vitamin-D with Calcium in sputum positive pulmonary tuberculosis patients taking ATT complemented the recovery of patients with active tuberculosis.

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Primary Extraskkeletal Ewing's Sarcoma of Nasal Cavity

Anand A S¹, Chandrakanth V R², Sagar C M², Vidisha Athanikar³

¹Associate Professor Dept. of Pathology, ²Assistant Professor, Dept. of Pathology, ³Professor & Head, Dept. of Pathology, Navodaya Medical College, Raichur, Karnataka

ABSTRACT

Extra skeletal Ewing's Sarcoma (EES) of nasal cavity is a rare soft tissue tumor, morphologically similar to the commoner Ewing's sarcoma (ES) arising from bone. We report a case of EES of nasal cavity in a nine year old male who presented with nasal obstruction. Contrast enhanced CT scan showed mildly enhancing soft tissue attenuating mass. Histopathologically examination showed round cell tumor which was confirmed by special stain and immunohistochemistry. PAS showed positivity for intracellular glycogen, Immunohistochemistry showed positivity for MIC-2,CK,S-100,EMA.

An extensive review of literature, to the best of our knowledge, did not reveal many cases of EES of nasal cavity, in children younger than ten years

Keywords: ES, Primitive Neuroectodermal Tumor (PNET), Nasal cavity, Children

INTRODUCTION

Extra skeletal Ewing's sarcoma (EES) was first described by Tefft et al^[1] in 1969 as paravertebral soft tissue tumor with histological appearance resembling Ewing's Sarcoma (ES). Angervall and Enzinger in 1975 first reported its pathological features.^[2]

EES represents a rare, rapidly growing , small round cell malignant tumor of the bone, of childhood and adolescence. It is the second most common primary malignant tumor of the bone in children after Osteosarcoma and accounts to 4-6% of primary malignant bone tumors. Male to female ration of EES is 1.5:1^[3]

EES usually occurs in the lower extremities, paravertebral tissues, chest wall, retro peritoneum and occasionally in head and neck. The head and neck region is involved in 2-7% of all EES. Majority of the cases occur in the mandible or maxilla, very rarely in the nasal cavity.^[3]

Most authors claim better prognosis for ES of head and neck compared to those arising in other location. There are reports of localized ES affecting the orbital roof, retropharynx and nasal cavity.^[4]

CASE REPORT

A nine year old male had complaints of nasal obstruction since 8 months and attended ENT OPD.

On examination, a large polypoid grey white mass was seen completely filling the left nasal cavity, extending outwards from the vestibule.

CT Scan findings: Scan with contrast showed mildly enhancing soft tissue attenuating mass involving nasal cavity and maxillary sinus, displacing the septum to the opposite side and causing thinning of adjacent bone.(Fig 1)



Fig. 1. Axial Computed Tomography Scan with contrast showing mildly enhancing soft tissue attenuating mass involving left nasal cavity.

Clinically it was diagnosed as inverted papilloma.

Per-operative findings : On lateral Rhinotomy and Maxillectomy, a greyish white friable mass was seen involving left nasal cavity and extending to frontal,

spenoidal, maxillary sinus, nasopharynx and base of the skull.

HISTOPATHOLOGY

Gross

Received multiple, friable, pink tan tissue of varying sizes largest measuring 5X3X2 cms, soft to firm in consistency. Representative bits were processed.

MICROSCOPY

Showed tumor tissue with cells arranged in sheets and lobules. The cells were small round to oval, with finely dispersed chromatin and scant to moderate clear cytoplasm. Mitoses was variable along with focal necrosis and neurofibrillary areas. (Fig 2, 3 & 4)

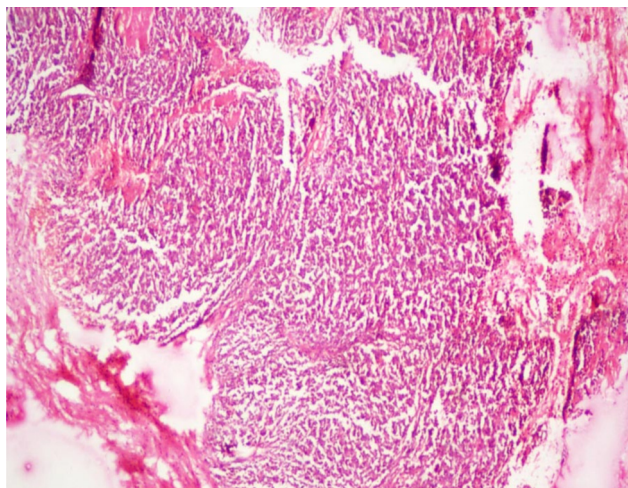


Fig. 2 Photomicrograph showing tumor cells arranged in lobules (H & E 4x)

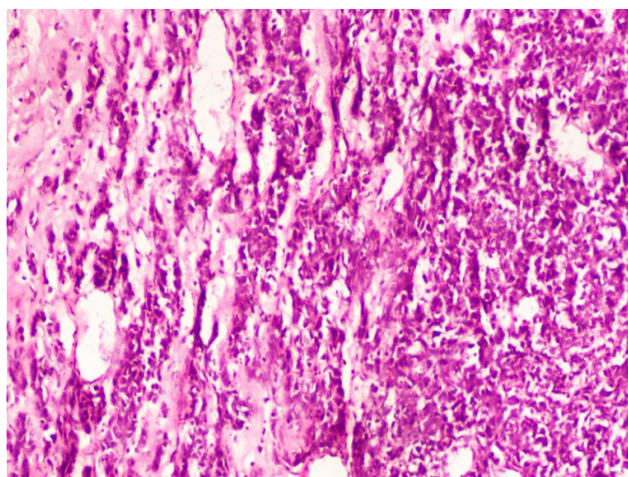


Fig. 3. Photomicrograph showing tumor cells arranged in sheets with focal neurofibrillary areas (H & E 10x)

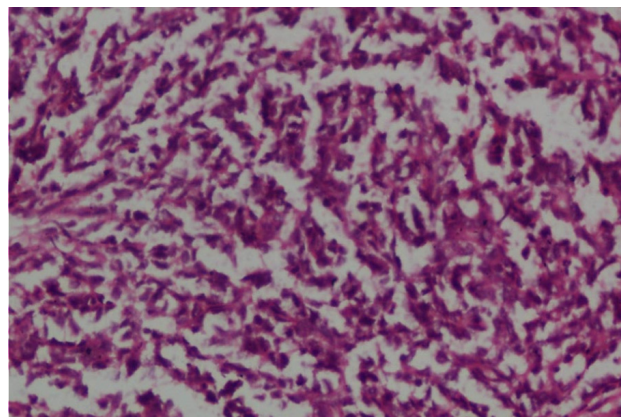


Fig. 4. Photomicrograph showing small round to oval cells with finely dispersed chromatin with scant cytoplasm (H & E 40x)

Histopathological diagnosis: Extra skeletal Ewing's Sarcoma/ Primitive neuroectodermal tumor (PNET) / Olfactory neuroblastoma.

Immunohistochemistry (IHC) :

Positive for MIC-2, CK, S-100, EMA

Negative for NSE, SYNAPTOPHYSIN, HMB, CHROMOGRANIN, LCA

IHC Diagnosis: EES / PNET

DISCUSSION

ES is one of the most controversial tumors. Ever since its first description by James Ewing as a "diffuse endothelioma", there has been remarkable evolution in the concepts regarding its histogenesis and relation with other small round cell tumors, including PNET.^[5]

EES is a rare malignant neoplasm of uncertain histogenesis.^[6] The peak incidence of Ewing's sarcoma is between 10-15 yrs. Although the exact etiology remains unknown, new research has shown that the genetic hall mark of Ewing's sarcoma consists of a specific gene sequence t(11:12) (q24;q12).^[7]

ES may originate from bone or less frequently from soft tissues. The differentiation of the extraskeletal soft tissue type from the classical skeletal type, is practically not possible.^[8] The differential diagnosis of small round cell tumors includes malignant melanoma, rhabdomyosarcoma, olfactory neuroblastoma, ES, reticulum cell sarcoma and acute leukaemia. Distinguishing ES from other small round cell tumors may be difficult.^[9,10] The essential diagnostic test in distinguishing Ewing's sarcoma from other small round cell tumors, is the immunocytochemical

markers using CD99/013 marker^[11-13] and in addition to immunohistochemistry, molecular studies using PCR to detect characteristic chromosomal translocations like EWS/FLI1 or EWS/ERG, which are truly definitive for ES.^[12]

Because of negative staining for Leucocyte common antigen along with positive intracellular glycogen, lymphoma and neuroblastoma were excluded.

Cytological features such as rounded nucleoli, scanty cytoplasm and poorly defined boundaries and immunohistochemically positive stains for MIC- 2, Cytokeratin, S-100 and Epithelial membrane antigen, confirmed the diagnosis of ES.^[3]

However, negative stains for chromogranin, synaptophysin as expected positive stain in ES, was considered to be due to the loss of antigenic characteristic of the tissue.^[3]

This present case demonstrated no bony origin of the tumor in the nasal cavity and concluded that, differentiation from an uncommitted mesenchymal cell in soft tissue in this region is a possibility, as previously presented very few cases in the literature.^{[9] [14]}

In addition to the site of the tumor, the patients age is unusual for this neoplasm.^[3]

Tumor size of volume less than 100 ml, also has an effect on prognosis having a better survival rate.^[15]

Early and confident diagnosis coupled with combined surgical excision of gross disease and modern chemo-radiation treatment modality appears to be the most effective treatment plan.^{[8][11][12][16]}

Our case would appear to be one of the few cases of primary EES of nasal cavity reported in a nine year old child.

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Incidence of Complications in Contact Lens Wearers : A Prospective study

Anand Verma¹, Prerana Agarwal², Ritvija Dixit², Pratibha Kaushal³, Tarana Sarwat⁴

¹Assistant Professor, Department of Ophthalmology, ²Senior Resident Department of Ophthalmology, ³Senior Resident Department of Anaesthesiology, ⁴Junior Resident Department of Ophthalmology, School of Medical Sciences & Research, Sharda University Greater Noida (U.P.) India

ABSTRACT

Despite high success rate of Refractive surgeries, contact lenses still continue to be good modality to overcome low vision due to refractive error. But along with the ease to use and disinfecting, the same continue to pose a challenge for an ophthalmologist when it comes to its complications. Long term wearing of contact lenses can involve not only the cornea but also the conjunctiva, and lids which in turn can lead not only to mild visual blurring but also permanent blindness if not detected at an early stage. The present study was conducted on 250 contact lens wearers and they were evaluated to determine the types and incidence of complications associated with prolonged use of contact lenses.

Keywords: Soft Contact Lenses (HEMA), RGP Lenses

INTRODUCTION

Contact lenses are a practical modality for correction of refractive errors. A growing incidence of complications has accompanied with increased use of contact lenses. Many of today's lens materials have much higher DK values, and there are wide varieties of highly effective, easy to use disinfecting systems. Despite these improvements, contact lens related complications are very common and continue to our department often posing a greater challenge for us than fitting the lens.

The study was conducted in the contact lens clinic outpatient department of ophthalmology in Sharda Hospital of School of Medical Sciences & Research, Sharda University. In our study, 250 contact lens wearers were evaluated to determine the types and incidence of complications associated with prolonged use of contact lenses. The lenses used in the study were soft contact lenses (HEMA) and RGP lenses. All 250 patients fitted in the department into two groups. 1) Soft contact lens (HEMA) with medium water content

and 2) RGP lenses. Soft contact lens wearers were 220 in number and RGP lens wearer were 30 in number. Both the group wore the lenses for 2 years.

MATERIALS & METHOD

This is prospective study, conducted on 250 contact lens wearers in the Department of School of Medical Sciences, Sharda University Greater Noida (UP) India from 1 July 2010 to July 2012. The clinic provides soft daily wear, bandage, cosmetic and toric contact lenses, PMMA lenses & RGP lenses of various DK values. The study was carried out to determine the types of complications encountered in 2 groups of contact lens wearers. The lenses used in the study were poly 2-hydroxyethylmethacrylate (soft lenses) and RGP. All the patients had been fitted in the department into two groups - 1) Soft contact lens (HEMA) with medium water content and 2) RGP lenses, using fluorosilicone acrylate material. The study included total 250 contact lens wearers out of which Soft contact lens wearers were 220 in number and RGP lens wearer were 30 in number. All these patients were followed up for any contact lens induced complication over a two years period from 1 July 2010 to July 2012. All patients included in the study had worn the lenses for a minimum period of 2 years. The patients included were all seen at least three times during the two years period of the study.

Corresponding author:

Anand Verma

Assistant Professor

(SMS&R), Sharda Hospital, Sharda University, Plot no 32-34 KP-3, Greater Noida, U.P.(India)

E mail : dr_anand74verma@rediffmail.com

Precise details of lens wear, wearing time, month of lens use, cleaning methods and demographic data were first recorded. Subsequently all patients were examined thoroughly with the help of slit lamp bio microscope and all pathology described and recorded. Contact lenses of patients were also examined in detail. A diagnosis was determined as complication in that contact lens wearer and appropriate treatment instigated.

Visual acuity with and without glasses of every patients were recorded, refraction of both the eyes were done. Corneal topography, palpebral aperture size, IOP using goldmann applanation tonometer of every contact lens wearer were recorded at every visit. Lids

and lid margins were examined for any pathology like lagophthalmos, blepharitis, meibominitis, entropion, ectropion, trichiasis. Blink rate and pattern of blink were also recorded. Using Slit lamp biomicroscope, cobalt blue filter and fluorescein dye, tear film for any debris and lipid, tear meniscus, basal tear secretion and tear break up time were recorded. Conjunctiva for xerosis, bitot spot, any degeneration, papillae, follicles and cornea for any surface irregularities, filamentary keratitis, vascularization, dystrophies and degeneration, any infiltrates, any perforation were examined. Pupil, anterior chamber and lens were also examined thoroughly. Fundus was examined using direct and indirect ophthalmoscope.

OBSERVATION

Table 1 : Distribution of patients, according to age

Age	Soft(220)		RGP(30)		Total(250)	
Years	No	%	No	%	No	%
< 20	60	27.27	8	26.66	68	27.2
21- 35	141	64.09	19	63.33	160	64
36 - 55	20	0.09	2	6.66	22	8.8
>55	-	-	-	-	-	-

Table 1 shows that 68 contact lens wearers (27.2%) were below 20 years age, 160 contact lens wearers (64 %) were between age 21to35 years and 22 contact lens wearers (8.8%) were in age group of 36 to 55 years.

Table 2 : Distribution of patients , according to sex

Total Patients	Male		Female	
	No	%	No	%
250	71	28.4	179	71.6

Female to male ratio = 2.52: 1

Table 3 : Distribution of patients , according to Refractive error

Age	Soft(220)		RGP(30)		Total(250)	
Years	No	%	No	%	No	%
Myopia	190	86.36	30	100	220	88
Aphakia	8	3.63	-	-	8	3.2
Hypermetropia	22	10	-	-	22	8.8

Table 3 shows that 220 contact lens wearers (88%) were myopic, 8 contact lens wearers (3.2%) were aphakic and 22 contact lens wearers (8.8%) were hyperope.

Table 4 : Wearing Schedule

	Soft lens	RGP lens
1 st day	2 Hours	2 Hours
2 nd day	4 Hours	3 Hours
3 rd day	6 Hours	5 Hours
4 th day	8 Hours	7 Hours
5 th day	10 Hours	8 Hours
6 th day	12 Hours	10 Hours
7 th day	14 Hours onward	12 Hours onward

Total time is divided in two parts, wearied half the time in the morning and half the time in the evening during adaptation for a week and then continued at a stretch.

Table 5 : Complications associated with contact lens wear

Age	Soft(220)		RGP(30)		Total(250)	
	No	%	No	%	No	%
CLARE	15	6.8	1	3.3	16	6.4
Corneal oedema> 5%	3	1.36	1	3.3	4	1.6
Corneal Warpage	3	1.36	1	3.3	4	1.6
Keratoconus	-	-	-	-	-	-
Epithelial splitting	14	6.36	2	6.6	16	6.4
Corneal ulcer Infectious keratitis	2	0.9	-	-	2	0.8
Corneal Vascularization	4	1.8	1	3.3	5	2
Giant Papillary Conjunctivitis	27	12.27	1	3.3	28	11.2
Dry eye	20	9	-	-	20	8
Lens Deposits	20	9	-	-	20	8
Lens loss	3	1.36	1	3.3	4	1.6
Lens damage	2	0.9	-	-	2	0.8
Lens aging	6	2.72	-	-	6	2.4
Improper fit	4	1.81	1	3.3	5	2
Handling problem	5	2.27	1	3.3	6	2.4
Solution hypersensitivity & toxicity	3	1.36	-	-	3	1.2

Table 6: Drop out of Contact lens wearers

Age	Soft(220)		RGP(30)		Total(250)	
	No	%	No	%	No	%
Failed wear in 1 st year	18	8	2	6.66	20	8
Failed wear in 2 nd year	14	6.36	4	13.33	18	7.2
Total Failed wear	32	14.5	6	20	38	15.2
Successful wear	188	85.45	24	80	212	84.8

This table shows that out of 250 wearers only 212 patients (85%) could wear successfully while 38 patients (15%) failed to wear in 2 years period.

Table 7: Regular Follow up - Attendance

Follow up visits	Number of Patients	
	Soft lens wearers(220)	RGP lens wearers(30)
2 weeks	216	15
2 months	200	10
6 months	100	5
Total visits	516	30
Mean No. of visits	2.345	1

Ratio of Visits of Soft lens wearers : RGP lens wearers = 2.345:1

Table 7 shows that soft lens wearer group needed 2.345 times as many visits as RGP lens wearer group.

DISCUSSION

The study was conducted to find out the complications associated with prolonged use of contact lens.

Giant papillary Conjunctivitis is the most common complication in our study and its incidence was 11.2%. In our study it is more common in soft contact lens wearers (12.27%) as compared to RGP lens wearers(3.3%).. In Donshik P.C et al² study, incidence of GPC in daily wear soft lens population is estimated at 15% while among RGP lens wearers it is 2%.² The most common complication were contact lens induced papillary conjunctivitis(6.39%) in Nagachandrika T, Kumar U et al⁹ study at LVPEI Hyderabad. Contact lens related Acute Red Eye was second most common

complication. The incidence of CLARE is 6.4%. It is more common in soft contact lens wearer (6.8%) in comparison to RGP lens wearer (3.3%). It is also observed that bacterial contamination may have role to play in pathogenesis of CLARE.

Corneal oedema >5% was seen in 1.6% cases. It was more common in RGP lens wearer (3.3%) than in soft contact lens wearer (1.36%). Lactic acid produced by hypoxic epithelium metabolism is thought to produce corneal oedema.

Corneal Warpage : This is because of distortion of cornea due to long term use of contact lens. Similar to corneal oedema, corneal warpage incidence is 1.6% and is more common in RGP lens wearers than in soft contact lens wearers. In our study 3 soft contact lens wearers (1.36%) and 1 RGP lens wearer (3.3%) presented as corneal warpage.

Keratoconus : In our study no case was reported.

Epithelial Splitting : Ocular surface damage and hypersensitivity to lens care products produce fine , diffuse superficial punctate keratitis and corneal abrasion. Incidence of epithelial splitting is 6.4% in our study as compared to 7.08%. Soft contact lens wearers are prone to develop epithelial splitting and abrasion (6.36%) as compared to RGP lens wearers (0.6%) in our study. Jalbert I et al observed epithelial splitting associated with wear of silicone contact lenses which was due to mechanical irritation and dehydration of lens surface.³

Corneal Ulcer: Corneal infection caused by microorganism are the most serious complication of wearing contact lens. In our study only two cases of corneal ulcer were seen which was associated with soft contact lens use. One ulcer was bacterial and one was due to acanthamoeba. No case was reported in RGP lens wearers. Lisa Keay et al observed that ocular trauma and contact lens use are the main predisposing factors causing microbial keratitis in the age range of 15-64 years.⁶ P B Morgan et al noted that there is a significantly higher incidence of severe keratitis in wearers who sleep in contact lenses compared with those who only use lenses during the waking hours. Those who choose to sleep in lenses should be advised to wear silicone hydrogel lenses.⁸

Corneal Vascularization : Common in patients with poorly fitting lenses. It can also occur due to hypersensitivity or toxicity reaction to lens care system containing preservative. Corneal neovascularization

were found in 4 patients (1.8%) among soft contact lens wearers as compared to 1 patient (3.3%) among RGP lens wearers. Total incidence was 2% in our study while in Dixon JM et al¹ study (1967) it was 2% same as in our study and 4% in Nagachandrika T , Kumar U et al study⁹ .

Dry eye : It is earliest complication of contact lens wearers, in our study 8 % cases of dry eye were reported among contact lens wearer while no case of dry eye was found in among RGP lens wearers. Sengor et al¹⁰ also observed that Silicone hydrogel lenses produce significant changes on tear film and impression cytology of the ocular surface in long-term use.¹⁰

LENS RELATED COMPLICATION

Lens deposits : These are protein deposits that occur on contact lens and are removed by cleaning the lens. In our study 20 lens wearers got their lens deposited. The deposits were seen only in soft contact lens wearers(9%) and not seen in RGP lens wearers , overall incidence was 8 %. Bower and Tighe 1987 observed that 5% of lenses had between 15 and 82 deposits and 20% had less than 10 deposits. Soft hydrogel contact lens materials deposit low level of lysozyme and high level of lipid deposition compared with ionic contact lens materials.⁴

Lens damage-the higher the water content and the thinner the lens, the more readily it will split. In our study (0.9%) soft contact lens wearer got their lens damaged while no RGP lens was found damaged. Incidence of lens ageing were 2.4%. Improper lens fit can limit tolerance and can cause irritation and discomfort. In our study 5 patients were improperly fitted. 4 patients (1.6%) lost their lenses.6 patients (2.4%) had handling problem.

SOLUTION HYPERSENSITIVITY AND TOXICITY

It is type 3 and type 4 hypersensitivity that is found as allergic response to preservatives in ophthalmic preparations. The incidence of thimerosal hypersensitivity, documented in the dermatologic literature, range from about 7% in the United States, in our study it is 1.2%. On withdrawal of contact lens, pathology subsided within 24 hours. Mark B et al⁷ have also stated that many of contact lens related complications can be avoided but with the growing disconnect between the lens wearers and eye care

practitioner as a result of mail-order companies, the risk to patient increases.⁷

Incidence of contact lens related complications was more in soft contact lens wearers as compared to RGP wearers. But as observed by Warmonderweg et al¹¹ complications caused by hard lenses are usually noticed earlier by the patient than those due to soft lenses because the lesions caused by hard lenses are usually painful whereas those due to soft lenses are not.¹¹ Giant papillary Conjunctivitis was the most common complication followed by Contact lens related Acute Red Eye while in Nagachandrika T, Kumar U et al⁹ study contact lens related complications was more in soft contact lens wearers as compared to RGP wearers. Giant papillary Conjunctivitis was the most common complication followed by vascularization and SPK.⁹ and similar results was seen in Julie F.Y. Forister, O.D et al study.⁵

Eighty five percent (212 wearers) wore the lens successfully during period of 2 years. Fifteen percent (38 wearers) were no longer wearing the lenses on a prolonged basis after 2 years.

CONCLUSION

Our study highlights that as number of contact lens wearers and duration of wearing increase, patient with complications will also increase. Incidence of contact lens related complications was more in soft contact lens wearers as compared to RGP wearers. Giant papillary Conjunctivitis was the most common complication followed by Contact lens related Acute Red Eye.

Simple instructions like duration of wear, not to use the lens overnight, technique of cleaning, not to use tap water, frequency of cleaning, when to change lenses, frequency of use of enzyme tablets and most importantly, when to run to your eye specialist seems to be either poorly communicated or conveniently forgotten. A large number of these complications can be easily avoided if patients are told the seriousness of these complications.

Conflict of Interest : nil.

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Source of Funding : No funding was required since it was an observational study and the patients were user of contact lens.

Ethical Clearance : Since it is an observational study, no ethical clearance was required.

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A Study of Hypertension and its Sociodemographic Factors among Bus Conductors in North Karnataka

Bhagyashri Joshi¹, Arun Joshi², Katti SM³, Mallapur⁴, Viveki RG⁵

¹Associate Professor, Dept of Pathology, JNMC, Belgaum, ²Assistant Professor, Dept of Community Medicine, BIMS, Belgaum, ³Professor, Dept of Community Medicine, JNMC, Belgaum, ⁴Lecturer and Statistician, Dept of Community Medicine, JNMC, Belgaum, ⁵Associate Professor, Dept of Community Medicine, BIMS, Belgaum, Karnataka

ABSTRACT

Background: Hypertension is one of the diseases of occupational origin. It is ranked fifth amongst the ten most important categories of occupational illness. The prevalence of hypertension increases when selected occupational groups are screened.

Objectives: To study the prevalence of hypertension among bus conductors and to determine the occupational and social factors associated with it.

Study design: A cross sectional Study.

Study participants: Bus Conductors (370 participants).

Materials & Method: A detailed pre tested and validated questionnaire was used to collect information on Social and Occupational risk factors for hypertension. Blood pressure was measured using mercury sphygmomanometer and the auscultatory method. In statistical analysis, summary figures like rates, percentages and chi-square test were used.

Results: The prevalence of hypertension was 14.8%. The upward trend in prevalence was observed with increase in age and the association was statistically significant. Prevalence of hypertension was gradually increased as the duration of service increased and it is highest among those (36.3%) whose duration of service in the department was more than 30 years.

Conclusion : The prevalence of hypertension among conductors was 14.8% which is similar to general population.

Keywords: Hypertension, Occupational Stress, Social Factors, Bus Conductors

INTRODUCTION

Hypertension is a major chronic life-style disease and an important public health problem worldwide. According to a recent report one billion adults had hypertension in 2000 and this is predicted to increase 1.56 billion by 2025^{1,2}. It leads to numerous micro/

macro vascular complications. The subjects with hypertension are known to have a two-fold higher risk of developing coronary artery disease, four times higher risk of congestive heart failure and seven times higher risk of cerebrovascular disease compared to normotensive patients. Hence it is important to maintain blood pressure (BP) within the normal range^{1,3,4}. Hypertension is one of the major risk factors for cardiovascular mortality, which accounts for 20-50% of all deaths⁵. WHO has estimated that high blood pressure causes 1 in every 8 deaths worldwide. The burden of hypertension in terms of DALY's is 64.3 million (4.4% of the total). Of this 20% occurs in Western Pacific region, 19% in South-East Asia region and 16% in Europe⁶.

Corresponding author:

Arun V Joshi

Assistant Professor,
Department of Community Medicine,
Belgaum Institute of Medical Sciences,
Belgaum-590001.

Ph no. 09844505304

E-mail- drjoshiarun@gmail.com

Hypertension is one of the diseases of occupational origin. It is ranked fifth amongst the ten most important categories of occupational illnesses. As per the report of National Institute of Occupational Safety and Health USA, the percentage of hypertensives increases more when selected occupational groups are screened⁷. The transport personnel form one of the largest groups employing personnel of different caste and creed, various age groups, subjected to severe stress and strain. One of the most promising formulations of chronic stress concept has been "Job strain" defined as work with high psychological demand and associated with hypertension⁸.

The transport workers are exposed to irregular working hours, irregular eating habits, unhealthy habits like alcohol and smoking, traffic congestion and exposure to air and noise pollution. It was also observed that there is increased prevalence of hypertension among these occupational group.⁹ The hypertension was an important cause of morbidity among the transport employees. Very few studies have been conducted among conductors compared to drivers. With this background the present study was carried out among this work group and screening was carried out for detection of hypertension.

OBJECTIVES

To study the prevalence of hypertension among bus conductors and to determine the occupational, social factors associated with it.

MATERIALS & METHOD

The present cross sectional study was undertaken to study the prevalence of hypertension and its association with occupational and social risk factors among bus conductors of North Karnataka.

Sample size: Since the prevalence of hypertension among bus conductors was not known, to calculate the sample size, the prevalence was presumed to be 50%, with 10% relative error of the prevalence, the sample size arrived at was 400 and 400 conductors were selected at random by using 4 digits random number table for the study but, 370 participants agreed to undergo evaluation.

All the study participants were interviewed personally by using pre-tested and validated structured questionnaire and detailed information regarding age, educational status, socio-economic status, type of family, marital status and occupational factors was collected. The instruments used in this

study included a mercury sphygmomanometer and stethoscope. These instruments and technique were initially standardized during the pilot study and were regularly standardized throughout the period of data collection.

Blood pressure was measured using mercury sphygmomanometer and the auscultatory method. The participant was first asked to sit quietly and comfortably on a chair with back supported for about five minutes in a quiet room. Two readings of systolic blood pressure (SBP) and diastolic blood pressure (DBP) were taken and recorded at an interval of at least 10 minutes and the mean value for each is calculated. Study participants with either systolic blood pressure ≥ 140 mm Hg or diastolic blood pressure ≥ 90 mm Hg were termed as hypertensives as per the latest definition criteria.^{10,11} Participants who were known hypertensives were also included in the study for calculating prevalence of hypertension.

Statistical analysis: Summary figures like rates, percentage were calculated. Chi square test was used to test the association between hypertension and various socio-demographic and occupational risk factors.

RESULTS

Out of 400 study participants selected randomly, 370 gave their consent to participate in a study. All were males. Among them, 129 (34.9%) were in the age group of 30-39 years and 106 (28.6%) were in the age group of 40-49 years, 57 (15.4%) had studied up to graduate level, 155 (41.9%) belonged to class II, 93 (25.1%) belonged to class III (Table 3), and majority (87.3%) were Hindus. Out of 370 participants, 350 (94.6%) belonged to nuclear family, 14 (3.8%) belonged to joint family and 6 (1.6%) belonged to three generation family and 35 (9.4%) were unmarried and 334 (90.6%) were married.

The present study showed that, 55 (14.8%) conductors were hypertensive. Majority of hypertensive participants 38 (69.1%) were having mild hypertension. Out of 55 participants who were hypertensives, only 22 (40.0%) had been previously diagnosed as hypertensive and were under treatment. Among 22 participants who were under treatment only 10 (18.2%) were taking regular treatment, in which only 4 (7.3%) were having normal blood pressure. The highlight of the present study is that, out of 55 hypertensive conductors, 33 (60.0%) were newly diagnosed and they were not aware of their hypertensive status. (Table 1 & 2)

Table1. The prevalence of hypertension & various grades of blood pressure

Prevalence	No.	%
Hypertension	55	14.8
I] Mild hypertension: (SBP 140-180 mmHg or DBP 90-105 mmHg)	38	69.1
II] Moderate and severe hypertension (SBP >180 mmHg or DBP >105 mmHg)	6	10.9
III] Isolated systolic hypertension (SBP >140 mmHg and DBP <90 mmHg)	7	12.7
Total	51	92.7
Hypertensives with normal blood pressure because of regular treatment	4	7.3

Table2. Hypertensives according to past history of hypertension

History of Hypertension	Conductors	
	No.	%
Present (Known Hypertension)	2233	40.060.0
Absent (Newly detected hypertension)		
Total	55	100.0

The hypertension was not found in below 30 years of age group. The upward trend in prevalence was observed with increase in age and the association was statistically significant. The hypertension was found significantly associated with socioeconomic status. The other social factors like type of family, marital status, education, religion were not associated with raised blood pressure in the present study. (Table3)

Table 3. Age wise prevalence of Hypertension and other associated social factors.

	Conductors		Hypertensives		P value
	No. (N=370)	%	No. (N=55)	%	
Age in Years					
20-29	70	18.9	0	0	$\chi^2=43.092$; df=2; $p<0.000$
30-39	129	34.9	11	8.5	
40-49	106	28.6	19	17.9	
≥ 50	65	17.6	25	38.6	
S-E Status					
Class I	25	6.7	7	28	$\chi^2=26.847$; df=3; $p<0.000$
Class II	155	41.9	37	23.8	
Class III	93	25.1	8	8.6	
Class IV	92	24.9	3	3.2	
Class V	5	1.3	0	0	
Educational Status					
Primary	7	1.9	0	0	$\chi^2=1.650$; df=2; $p=0.438$
Secondary	180	48.6	32	17.8	
PUC/ Diploma	126	34.1	15	11.9	
Graduate	57	15.4	8	14	

Among hypertensive participants, 14(33.3%) gave family history of hypertension, 38(12.2%) did not give family history of hypertension and 3(18.7%) were not aware of the family history. The results were statistically significant ($\chi^2=13.289$; df = 2; $p<0.000$).

The occupational factors were also studied. As the duration of service increased, the prevalence of hypertension also increased. The results were statistically significant. Significant results were observed with job satisfaction also. (Table4)

Table 4. Occupational factors associated with hypertension among study participants

Duration of Service (In Years)	Conductors		Hypertensives		P value
	No.	%	No	%	
10-Jan	167	45.1	7	4.2	$\chi^2=38.322$; df=3; $p<0.000$
20-Nov	107	28.9	17	15.9	
21-30	85	23	27	31.8	
>30	11	3	4	36.3	
Job Satisfaction					
Satisfied	327	88.4	38	11.6	$\chi^2=40.018$; df=2; $p<0.000$
Dissatisfied	9	2.4	3	33.3	
Neutral	34	9.2	14	41.2	
Total	370	100	55	14.8	

DISCUSSION

Transport personnel particularly the bus conductors are one such group who are at risk of developing hypertension due to nature of their profession. In the present study prevalence of hypertension was 14.8% among conductors. A study conducted by Mandal S et al¹² showed that the prevalence of hypertension was 47.2% among urban population aged ≈ 40 years which is very high compared to our study. This could be due to exclusion of age group between 20 – 40 years, which is included in our study. Another study conducted by Reddy SS et al¹³ showed hypertension prevalence to be 8.6% among urban general population, which is less compared to our study.

The present study revealed that, the prevalence of hypertension increased with increase in age and was highest 38.6% in those who were more than 50 years. This association between hypertension and age was found to be statistically significant ($p<0.000$). These findings compare well with results observed by Reddy SS et al¹³, Todkar SS et al¹⁴, Sadhukhan SK et al¹⁵, Bagchi SC et al¹⁶, Khadilkar HA¹⁷, Gupta SP et al (1977)¹⁸, Gupta SP et al (1978)¹⁹, Sharma BK et al²⁰, Joshi PP et al²¹, which showed increased prevalence of hypertension with increase in age.

In the present study the prevalence of hypertension was found to be 28.0% among participants belonging to class I according to modified B.G.Prasad's classification and steadily decreased to 3.2% among conductors belonging to class IV. The association was found to be statistically significant, showing that hypertension was positively associated with higher socioeconomic status ($p < 0.000$). The results of the present study is similar to the studies conducted by Todkar SS et al¹⁴, Gupta SP et al (1977)¹⁸, Gupta SP et al (1978)¹⁹, Sharma BK et al²⁰.

The present study revealed that, the prevalence of hypertension was higher (17.8%) in participants who studied up to secondary level. It was lower among conductors who studied up to PUC (12th std)/ Diploma (11.9%) and no one was hypertensive who had studied up to primary level. There was no association found between hypertension and educational status. These finding correlates well with the study conducted by Hazarika NC et al²² in 2002 which did not find any association between hypertension and educational status, but in contrast with the result revealed by Khadilkar HA¹⁷ which shows association between hypertension and educational status.

Out of 55 conductors who were hypertensives only 40% had been diagnosed with hypertension and were under treatment and the rest (60%) were newly diagnosed after the screening. Our study yield was 60%. Among conductors, 33.3% were hypertensives who gave family history of hypertension which was slightly more compared to Tirupati study in which, 23.3% hypertensive gave family history of hypertension¹³.

Duration of service is one of the indicators of psychosocial stress. The conductors and other transport personnel are exposed to irregular timings and prolonged exposure definitely increases the distress levels. Prevalence of hypertension was gradually increased as the duration of service increased and it is highest among those (36.3%) whose duration of service in the department was more than 30 years. The results were statistically significant in the study participants ($p < 0.000$). Similar results were seen in a study, conducted by Ragland DR et al²³ in San Francisco Municipal Railway among transit vehicle operators. As the duration of service increased, psychosocial stress also increased which leads to increased prevalence of hypertension, as seen in the present study.

In the present study, prevalence of hypertension was more in conductors (33.3%) who were not satisfied with their job compared to 11.6% in conductors who were satisfied with their job. This association was also statistically significant ($p < 0.000$). Job satisfaction is also one of the indicator of psychosocial stress. Psychosocial stress would be definitely more in those who were not satisfied with their job which leads to increased prevalence of hypertension in them as seen in our study.

CONCLUSION

The prevalence of hypertension among conductors was similar to general population but, 60% of them were not aware of their condition. The screening among high risk group has provided a good yield. The sociodemographic determinants found to be significantly related to hypertension were, increasing age and high socioeconomic status and occupational risk factors significantly associated with hypertension were long duration of service and lack of job satisfaction.

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Profile of HIV Positive Attendees of an Integrated Counseling and Testing Centre in Meerut- A Changing Trend

Ashutosh Rawat¹, Anita Pandey², Molly Madan², Anjula Mishra³, Vibha Singh⁴, Shivendra⁵

¹Assistant Professor, ²Professor, ³Medical officer ICTC, ⁴Counselor ICTC, ⁵Msc. Department of Microbiology Subharti Medical College, Swami Vivekananda Subharti University, Meerut, Uttar Pradesh

ABSTRACT

Epidemiology of HIV-AIDS in an area especially with regards to socio-demographic factors helps in choosing and implementing a particular intervention in much better way. Study included counseling and testing of clients that were either self initiated or referred from the hospital over a period of 2 years. Analysis of ICTC data of all positive attendees was done. HIV positivity rate was 1% with male to female ratio of 2.2:1. Majority of positive males were literate and belonged to service class whereas most of the positive females were housewives. Spillage of the epidemic on to general population might well cause significant alteration in trends noted till times.

Keywords: HIV, Seropositive, ICTC, Attendees, Counseling

INTRODUCTION

The first case of HIV infection in India was diagnosed in 1986 at Chennai¹. Since then widespread transmission began with successive waves of transmission to highest risk group (commercial sex workers, homosexual men, drug users) to bridge population (clients of sex workers, STD patients, migrant population and partners of drug users), and then to general population. The epidemic followed the so-called type 4 pattern, first described in Thailand¹.

Prevention is the mainstay of the strategic response to HIV/AIDS in India as 99 percent population of the country is uninfected. Accordingly, National AIDS Control Programme NACP-III places the highest priority on preventive efforts while, at the same time, seeks to integrate prevention with care, support and treatment. Under NACP-III, Voluntary Counselling and Testing Centres (VCTC) and facilities providing Prevention of Parent to Child Transmission of HIV/AIDS (PPTCT) services are remodelled as a hub or 'Integrated Counselling and Testing Centre' (ICTC) to provide services to all clients under one roof. HIV counselling and testing services were started in India in 1997. There are now more than 4000 ICTC's, mainly located in government hospitals².

Planned expansion and efficient delivery of ICTC services encourage people to access care and treatment early, in turn strengthening prevention of HIV infection in the community. The ICTC at Subharti medical college was established with help of State AIDS control Society in October 2008. It is the first center in the outskirts of the Meerut city to provide full-service of voluntary counseling and testing for HIV infection. The center emphasizes the linkage between prevention (i.e. HIV counseling and testing), treatment and care. It also offers anonymous CD4 and viral load counseling and testing referral services. Other services available to HIV infected clients at the ICTC include those provided by a tuberculosis (TB) clinic, an obstetrics/gynaecology clinic and a skin clinic, as well as a referral service for government-sponsored antiretroviral therapy (ART). Increasing access to HIV treatment creates more demand for HIV testing and counseling as well as for CD4 and viral load testing³. In addition to providing voluntary counseling, testing services and treatment referral, the center also represents a unique source of information on the factors that affect HIV test results and HIV prevalence in the state.

In order to better understand the risk factors for HIV positivity & change in trends if any, we undertook

an analysis of the data that have been routinely collected at the center.

MATERIALS AND METHOD

Study group included clients tested positive for HIV at ICTC in Meerut from April 2009 to march 2011. All clients received pretest counseling, and they underwent HIV testing if they wished to proceed. All clients also received post-test counseling when they returned for their results. Those found to be HIV positive were given information on how to take care of themselves and where to obtain clinical assessment and treatment. Those who were test negative received information on HIV prevention. Information obtained from the counseling and the HIV test results were documented and linked by a number assigned to each client at the time of first contact with the center called Patient Identification Digit (PID).

Samples were tested as per the strategy and policy prescribed by NACO. A serum sample was considered negative for HIV if the first screening (E/R/S) test was negative. If reactive, the same sample was subjected to a second E/R/S test which utilizes a different principle or test and/or different antigen from the first one). In symptomatic patients sample was reported as reactive only if it was positive by two different E/R/S tests. However, in asymptomatic clients the same sample was subjected to a third E/R/S test. Such samples were reported as positive only if all three tests gave positive results. In case where the first E/R/S was reactive and the second E/R/S was nonreactive the same sample was subjected to third tie breaker E/R/S. If the third E/R/S was also negative the sample was reported as indeterminate and the patient was called back for repeat testing after 2-4 weeks. Whereas if the third test was negative, sample was reported as negative⁴. The data were analyzed retrospectively using standard statistical tools.

RESULTS

During the study period a total of 10153 clients were recorded as having attended the ICTC. Out of them 97.8% (9933/10153) clients were tested for HIV. The annual count of new clients tested was 3382 (98.3%) in first year that increased to 6551 (97.6%) in second year. In the second year there was a marginal increase in the percentage of self initiated clients to 6.6% (429/6551) from 5.7% (193/3382). However the

provider initiated clients remained almost the same being 94.3% (3189/3382) and 93.4% (6122/6551) in the first and second year respectively [Table 1].

Table 1. Comparison of ICTC Performance in two Years

Characteristics	1st year	2nd year	Total
Total Attendees	3439	6714	10153
Total tested	3382	6551	9933
Self initiated tested	193	429	622
Provider initiated tested	3189	6122	9311
HIV seropositives	36	64	100

The demographic, socioeconomic and risk behaviour profiles of HIV positive attendees are elaborated in Table 2. Positivity rate was 1.06% (positives/tested) in first year and 0.98% in second year. Overall positivity rate was 1.006% (100/9933). Male to female ratio of HIV positive attendees was 2.2:1 (69/31) with 35-49 years of age group being most affected. The median age of seropositive male was 36.3 years whereas that of seropositive female was 38.3 years.

Table 2. Demographic, Socioeconomic & Risk Behaviour Profiles of HIV Positives

VARIABLES	MALE (n=69) No. (%)	FEMALE (n=31) No. (%)	STATISTICS
Age			
<14	3 (4.3)	1 (3.2)	$\chi^2 = 0.95, 0.05$ df = 4, p >
15-24	4 (5.8)	1 (3.2)	
25-34	25 (36.2)	10 (32.3)	
35-49	27 (39.1)	15 (48.4)	
>50	10 (14.5)	4 (12.9)	
Marital Status			
Married	54 (78.3)	27 (87.1)	$\chi^2 = 7.64,$ df = 2, p < 0.05
unmarried	15 (21.7)	2 (6.5)	
widow/separated	0	2 (6.5)	
Education			
Illiterate	19 (27.5)	18 (58.1)	$\chi^2 = 0.53,$ df = 1, (illiterate vs literate) p > 0.05
1st-5th	20 (28.9)	7 (22.6)	
6th-10th	22 (31.9)	4 (12.9)	
11th & Above + graduation	8 (11.6)	2 (6.5)	
Occupation			
Labour	22 (31.9)	0	
Service	23 (33.3)	3 (9.7)	
Business	18 (26.1)	2 (6.5)	
Housewife	0	24 (77.4)	
Retired	1 (1.4)	0	
Student	0	1 (3.2)	
Doing Nothing	5 (7.2)	1 (3.2)	

Table 2. Demographic, Socioeconomic & Risk Behaviour Profiles of HIV Positives (Contd.)

VARIABLES	MALE (n=69) No. (%)	FEMALE (n=31) No. (%)	STATISTICS
Residence			
Rural	42 (60.8)	20(64.5)	$\chi^2 = 2$, df = 1, rural vs. urban p > 0.05
Urban	27 (39.1)	11(35.5)	
Pattern of Risk Behaviour			
Heterosexual	54(78.2)	31(100)	
Homosexual	7(10.1)	0	
Through Blood & Blood products	1(1.4)	0	
Through infected syringe & needles	2(2.9)	0	
Parent to child	1(1.4)	0	
Not specified/ Unknown	4(5.8)	0	
Client type			
self initiated	18(26.1)	19(61.3)	
provider initiated	51(73.9)	12(38.7)	
Co-infection with tuberculosis			
	12(17.4)	3(9.7)	

In relation to marital status 78.3% (54/69) positive males and 87.1% (27/31) positive females were married. The married to unmarried ratio was 4.8: 1 (81/17). Overall 63% clients were literate; however the literacy rate among seropositive males was 72.5% (50/69) as compared to 41.9% (13/31) among females. Most of seropositive males belonged to service class (33.3%) whereas majority of seropositive females were housewives (77.4%). With respect to place of residence 42 males (60.8%) and 20(64.5%) females were from rural area. Rural to urban ratio being 1.6:1. Baghpat was identified as hot spot in comparison to other areas of district Meerut with 24% of seropositive clientage alone from the area.

History of high risk sexual contact was associated with 78.2% (54/69) of seropositive males and not surprisingly with 100% positive females. Over all heterosexual transmission was responsible for seropositivity among 85 % of HIV positive clients. Proportion of clients with HIV TB co-relation was 15% (15/100).

Proportion of provider initiated seropositive clients out of total provider initiated clients tested was 0.68% (63/9311) whereas that of self initiated seropositive clients out of total self initiated clients tested was 5.9% (37/622).

DISCUSSION

Analysis of the characteristics of clients attending the ICTC over 2 years identified a number of strong facts. The high number of clients that attended the ICTC as well as those that were tested increased to about double the figures of first year. This clearly demonstrates the ongoing need for such services. Majority foot falls to ICTC consented and were hence tested for HIV implying satisfactory counseling services at the center from the very first year. However, the low percentage of self initiated clients means the need for intensive efforts in spreading the HIV-AIDS awareness in the area.

Epidemiological studies have shown that the disease is commoner in males than females (3:1). In our study there was reduced male to female seropositivity ratio of 2.2:1. Although HIV positive males outnumber females in all age groups, the difference of proportions is however not significant ($p > 0.05$). Both of these findings indicate increased vulnerability of females. Most vulnerable age group was 35-49 years. This is in correlation with national observation that most cases belong to sexually active age group between 20-49 years^{5,6}

In the present study married males and females had significantly higher seropositivity than unmarried. However other studies have shown marital status unrelated to HIV status^{5,7}. Living away from family has been reported as independent predictor of HIV acquisition in men⁸. Driven from family separation they easily succumb to commercial, casual and unsafe sex. This may have accounted for higher seropositivity among married males.

Most of the seropositive males in our study belong to service group (33.3%). Family separation owing to far off working places is not uncommon among this occupational class also. The labour class is a very close accompany with 31.9% seropositive males. This emphasizes migration as the common risk factor in both the groups. Alarming in our study the majority of seropositive females were housewives (77.4%). This fact is indicative of impending spill over of the epidemic from high risk population into the general population. Stretch of epidemic among females is point of great concern.

Awareness of HIV-AIDS remains low in rural areas and among women accounting for more seropositive clients from rural places as compared to urban areas⁹.

Multipartner sex probably account for 80% of infection, blood and blood product for 12% and sharing unsterilized injection syringes and needles for 5%⁶. In our study 85% transmission was through heterosexual route. Blood and blood product transfusion and infected needles and syringes accounted for 1% transmission each.

Interaction of HIV-AIDS with other infectious disease is an increasing public health concern. Tuberculosis is one of the significant infectious causes of HIV related morbidity.

Seropositivity percentage was higher in self initiated clients (5.9%) than in provider initiated clients (0.68%). Awareness campaigns should stress upon self initiation to know the HIV status.

To conclude, a number of risk factors for HIV infection were identified in our analysis. These were 35-49 years age group, married status, service class migrants, housewives and rural population. HIV-AIDS is more of a social problem. The important message, however, is that all organizations involved with HIV should be concerned that the existing programmes and campaigns may not be sufficient to prevent new infection. Information, education and communication must reach to larger rural population enabling them to adopt overall protective behaviour.

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Physiological Umbilical Hernia- A Case Report

Bhaudas Khanderao Jadhav¹, Sudhir Madhukar Sant²

¹Assistant Professor Anatomy Department, ²Professor and Head of Department, Anatomy Department, Smt. Kashibai Navale Medical College Pune, Maharashtra

ABSTRACT

Unknown embryo was brought to anatomy department from gynecology and obstetric department for preparing specimen for museum. On careful observation it was found that the embryo has umbilical hernia which physiological process occurring during 8 to 10 weeks of gestation.

Keywords: *Physiological Umbilical Hernia*

INTRODUCTION

At about the fourth week of development, the primordial gut is closed at both the cranial and caudal ends by the oropharyngeal and cloacal membranes. There is asymmetric enlargement and rotation of the distal part of the foregut to form the embryonic stomach. The duodenum forms from a combination of the distal-most foregut and proximal midgut, is pulled along with rotation of the stomach, and goes through a normal period of temporary obliteration because of proliferation of its epithelial cells. The jejunum, ileum, and a large portion of the colon are derived from the midgut. During the period of rapid growth of the midgut, there is a normal herniation of bowel into the proximal portion of the umbilical cord. This occurs at the sixth week of development and lasts until about the tenth week when the intestines return to the embryonic abdomen. As the intestines return to the abdominal cavity, they undergo a 180° counterclockwise rotation.¹

CASE REPORT

Age of embryo is approximately 6 to 10 weeks. There is umbilical hernia showing loops of intestine. Head and tail folding has occurred. pharyngeal arches are not visible properly, second arch overgrows and forms cervical sinus. Mouth is visible with tongue and upper and lower jaw. Nostrils are visible but external nares are absent. Otic vesicle and optic cup is visible. Upper limbs are well developed with fingers and lower limbs are well developed with toes.

DISCUSSION

In the earliest stages of development, external

features are also used to describe the stage of embryo. In the earliest stages, somites are main means of identification and somite number conveys a means of distinguishing embryos. Once the number of somites is too great to count with accuracy, the number of pharyngeal arches present is often used. By stage 23 (approximately 56 days) the embryo has a head that is almost erect and rounded, and eyelids are beginning to form. The limbs look far more in proportion and fingers and toes are separate. At this stage external genitalia are well developed, but sex can't accurately be determined.

Midgut grows faster than embryo, and herniates into base of cord (week 6), due to relative shortage of intra-abdominal space. Space is mainly occupied by large liver, spleen and kidneys. Returns to abdomen by 12 weeks²



Fig. 1. Physiological Umbilical Hernia – A Case Report

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Occupational Health Hazards in Welders of Palakkad District: An Appraisal

Biji C¹, Jisha T², Lakshmy C², Praseetha P C², Rehmas Beegum B P², Remya M², Safeena B², Sindhu B²,
Sruthi P M²

¹Assistant Professor, ²Student, Dept. of Zoology, Mercy College, Palakkad, Kerala

ABSTRACT

Welding exposes welders to a variety of work-related hazards, which may be deleterious to their health. The awareness of these hazards and the attitude towards them are important factors in the prevention of these hazards among the welders. This study assessed the level of awareness of the hazards, the work-related health complaints and the safety measures employed by the welders in local as well as industrial centers in Palakkad District. The study was carried out at 31 local workshops and 1 industrial center surrounding Palakkad Town. The welders were interviewed using semi-structured interviewer-administered questionnaires and the data obtained was analysed and presented as frequency tables and graph. The mean age of subjects was 32.68 ± 27.32 years. The literacy rate was 100%, of which, the school dropouts were 6.3% while, the subjects who completed technical education is only 3%. Despite the awareness of one or more occupational health hazards, the use of full protective devices by the subjects was generally low (10%) and the rate of health complaints was cent percent. The most prevalent health complaints were arc eye injuries (>90%) followed by burns (88%), skin problems (69%), tiredness, sleepiness and muscular weakness (45%), hearing impairment (35%) and respiratory ailments (22%); while the common personal protective equipment used were face shield (90%), helmet (77%), hand gloves (77%) and boots (29%). None of them used any form of ear or respiratory protection. The levels of awareness of occupational hazards and the work-related health problems among the welders though high was not commensurate with the use of safety and protective devices against the hazards. There is therefore need for health and safety education of these workers in order to promote positive health among them.

Keywords: Health Hazards, Welding, Arc Eye, Burns, Respiratory Ailments

INTRODUCTION

Welding is a process of joining of various metals and it is a common occupation in many parts of the world and welders, are often exposed to potential workplace hazards that can be injurious to their health especially when exposure is on a regular and cumulative basis. High intensities of ultraviolet radiation has been implicated as hazardous to the eyes, and exposure can cause *welder's flash* (photokeratitis or arc eye) and chronic doses has been tentatively linked to the formation of cataracts^{1,2}. Other safety and medical problems associated with welding include skin burn, foreign objects in the eye, fume inhalation, noise problems, electric shock and injuries resulting from explosion. Prolonged and repeated overexposure to welding fumes (composed of metals, metal oxides and other compounds) may potentially cause various respiratory dysfunctions and to the influenza-like condition known as metal fume fever^{3,4,5,6}. There have

been reports of carcinogenic and mutagenic effects due to chronic exposure to welding fumes in animals that may be extrapolated to man^{7,8,9}.

In view of the various occupational hazards associated with welding, and the absence of safety standard regulations in local engineering centers, the safety practices and associated health hazards among welders in and around Palakkad Town, Palakkad, Kerala is discussed here under.

MATERIALS AND METHOD

This survey covers welders from both local welding centers as well as from an industrial center (standard for comparison) around Palakkad Town. For the purpose of this survey, the area covered was divided into three zones and data sheets were administered by the members of the study group.

The subjects were asked questions relating to the type of welding performed, health problems related to eye, ear and respiratory system. Use of protection gears and protection clothing were also given due importance in the study. As an addendum, their experience in welding (exposure period), financial condition of the welder as well as awareness over the health hazards of welding was also subjected to survey.

The welders were assured that the individual results of the questionnaire would be confidential and were not meant for official use. This was necessary in order to encourage them to provide the information without the fear that some of the information would be used against them. Thirty five questionnaires were distributed. Data from the completed questionnaires were collated and analysed and the findings are presented here under.

RESULT AND DISCUSSION

A total of 32 welders were interviewed and the response rate was 91.4%. The post survey analysis of the data obtained brought out some striking information about what's happening in the welding arena. Almost all of the welders (27) worked with electric arc welding and rest (5) worked with both arc welding and oxyacetylene gas welding. Mean age of the welders was 32.69 with most of them in the 30-39 age bracket (Table 1(A)). Around 6.3% of the welders were school drop outs, 84.4% had completed matriculation, 6.3% completed plus two and 3% completed technical education (Table 1(B)). Of the subjects interviewed only 65.6% were ready to reveal their income status and out of that 76.2% were daily wage laborers. Their income status ranged from Rs. 125/- to Rs. 500/- per day based on their experience and skill (Table 1(C)).

Table 1: Socio-demographic data of the welders

A: Age distribution of the welders

Age Interval	Frequency	Percentage
18-20	4	12.5
20-30	9	28.1
30-40	14	43.8
40-50	3	9.4
50-60	1	3.1
60-70	1	3.1

B: Educational status of the welders

Educational status	Frequency	Percentage
Nil	0	0
High School	2	6.3
SSLC	27	84.4
Plus Two	2	6.3
IIT	1	3

C: Income status of the welders

Daily Income (Rs.)	Frequency	Percentage
100-200	2	9.5
200-300	10	47.6
300-400	6	28.6
400-500	1	4.8
500-600	2	9.5

Despite the awareness of the subjects to one or more health hazards associated with welding, cent percent of them experienced one or more occupational health hazard. More than 90% of the subjects suffered from eye problems, 88% suffered from burns, 69% suffered from skin problems, more than 35% of the subjects suffered from hearing impairment, 22% suffered from respiratory problems, and more than 45% suffered from either tiredness or sleepiness or muscular weakness (Fig 1). Upon analysis it was also brought out that the use of full protection gear was practiced by less than 10% of the welders and use of full protection clothing by less than 3% (Plate 1).

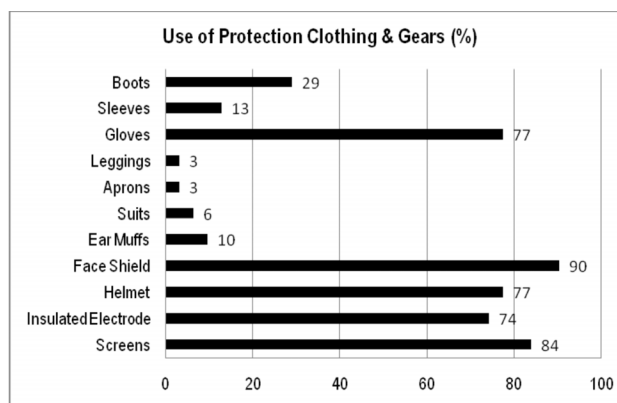


Fig. 1. Use of protection clothing (Boots, Sleeves, Gloves, Leggings, Apron, Suit) and gears (Ear muffs, Face shield, Helmet, Insulated electrode, Screen)



A



Plate 1: A and B shows grinding and cutting without any protection gears or protection clothing at a road side welding center near Mercy College Campus

EYE PROBLEMS

Major eye problems met with the subjects were, sand grain sensation (96%), tearing (94%), swelling (92%), pain (91%) and light sensitivity (57%) (Fig 2). These much expected problems are symptoms of a painful eye condition popularly known as 'Welder's Flash' (Arc Eye or Photokeratitis) caused by exposure of eyes from Ultra Violet rays either from natural or artificial sources. Common symptoms include sand grain sensation accompanied with pain, intense tears, swelling, eyelid twitching, discomfort from bright light and constricted pupils^{1,2}. UV light is absorbed by molecules known as chromophores, which are present in the eye cells and tissues. Chromophores absorb light energy from the various wavelengths at different rates – a pattern known as absorption spectrum. If too much UV light is absorbed, eye structures such as the cornea, the lens and the retina can be damaged. Chronic doses of UV radiation have been tentatively linked to the formation of cataracts. Around 87% of the subjects complained vision impairment at various levels (High (3%), medium (45%) and low (39%)). The subjects who don't have any eye problems had undergone technical education and were working in organized sector and have all the protection gears at their disposal.

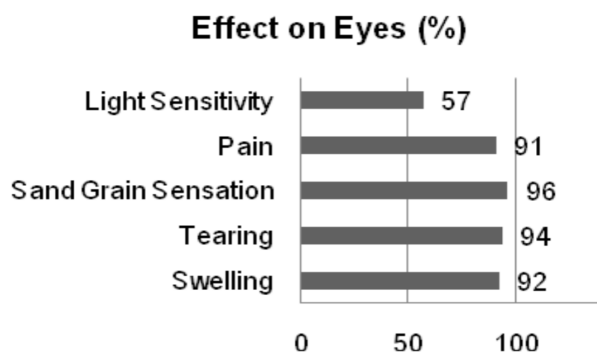


Fig. 2. Effect of welding on eyes (light sensitivity, pain, sand grain sensation, tearing, swelling) observed in the subjects

Upon analysis of the usage of protection gears it was brought out that more than 75% of the subjects either used helmets (77%) or hand held face shields (90%). This observation was a bit confusing that, even after using these protection gears the subjects were suffering from photokeratitis. Further probing on this aspect brought out that, a major share of these subjects is not using these gears constantly and 10% of the welders neither use face shield nor helmet. It was also made known that they are not aware of correct filter lens shading requirements (Indian (BIS)/ International standards) for selecting protection gears like welding helmet and face shield for eye and face protection. Auto-darkening filters incorporated into the protective devices which automatically change from a clear to a darkened state when the welding arc is struck allowing uninterrupted work by the welder could be a viable option^{10,11}.

HEARING IMPAIRMENT

It was shown that around 39% of the subjects were suffering from partial impairment (medium (19%) and low (20%)). Probably the most common operations that produce relatively high noise levels are plasma arc cutting and air carbon arc cutting. Other operations associated with many welding operations, such as chipping and grinding, are common sources of noise problems. Of the hearing impaired subjects 75% are doing carbon arc welding. In many cases, excessive noise associated with welding operations cannot be reduced by engineering controls. Exposure to high noise levels may result in hearing loss. Exposed workers should wear properly fitted ear protection. Only 10% of the subjects found to wear ear muffs and in those individuals who were performing carbon arc welding there wasn't any hearing problems. The time required to develop permanent hearing loss depends upon individual susceptibility, noise level and exposure duration. One of the subjects aged 60 yrs and exposed for a period of more than 30 yrs only experienced low impairment.

BURNS, RASHES AND INJURIES

Almost 69% of the subjects complained of having skin rashes and around 88% complained of burns (Fig. 3). Exposed skin is susceptible to cuts, scrapes and burns (electrical and thermal) and most of these hazards are due to improper use or lack of protection clothing. Of the surveyed subjects 77% uses gloves and 29% uses boots. The segment using other standard protection clothes like sleeves (13%), leggings (3%), aprons (3%) and suits (6%) were negligible.

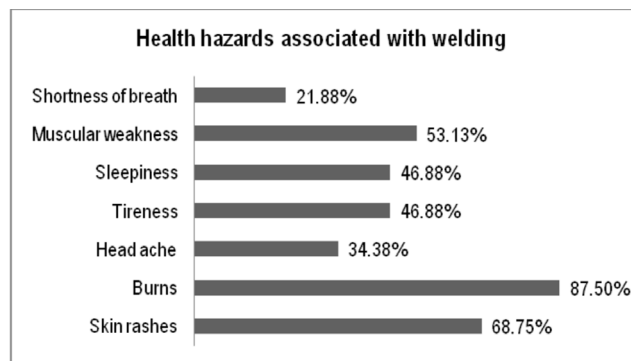


Fig. 3. Health hazards associated with welding

The excessive high temperature generated by the arc current may lead to burns and electric shocks. Contact with hot slag and sparks also causes skin burns. Ultraviolet rays from the arc may cause redness of the skin similar to sunburn. Skin contact with certain metal dusts, such as chromium and nickel, may cause a dermatitis characterized by dry, red, cracked itchy skin on the hands, forearms, and face. Passage of an electrical current into living tissues may cause electrical burns or fatal shock. Clinical manifestations usually depend on the amount of current that passes through the body.

Injuries such as lacerations and cuts by sharp or pointed metal panes, from high velocity particles may also occur. One of the subject interviewed was injured by a sharp metal piece accidentally pierced his eyes leaving him partially blind even after surgery. At that time he was not wearing any protection gear like helmet, face shield or goggles which might have protected him from that dreadful incident.

Respiratory problems and other health hazards

Almost 22% of the subjects complained about having shortness of breath (Fig. 3). Of the subjects interviewed 34.4% showed headache and dizziness, tiredness and sleepiness 47% and muscular weakness 53.1%. This could be associated with the gases, fumes and dusts that may cause irritation to eyes, lungs, nose and throat. Metal fumes usually contain a cocktail of metals like zinc, copper, cobalt, nickel, chromium, platinum, and their oxides.

Acute overexposure may include signs and symptoms such as watery eyes, nose and throat irritation, headache, dizziness, difficulty breathing, frequent coughing, or chest pains. Chronic exposure to contaminants may lead to their accumulation in the lungs, a condition which may be seen as dense areas

on chest x-rays. The severity of change is proportional to the length of exposure.

These findings clearly indicates what's happening in the welding arena especially in unorganized road side welding centers and the extreme necessity of reviewing available safety standards, monitor compliance and educate welders on the hazards associated with the profession and the need to take adequate precautions for safe welding.

CONCLUSIONS

The inadequacy of protective measures and lack of awareness are presumably responsible for the high number of reported cases of arc eye, hearing impairment, respiratory problems etc. Similar situation prevails in the case of burns and injuries acquired by welders in the process. It may be argued that because welding is a potentially hazardous occupation, this should be expected. However, if adequate protection gears had been used by the welders, the number of complaints has been less. More than that, almost all the welders in the road side welding centers were daily wage laborers and are incompetent to persuade employers to avail safe work environment. Employers in turn found these protection devices unaffordable. Hence, excessive incidence of health hazards can be correlated to the lack of funds to procure adequate protection gears, reduced use of available gears due to lack of in depth know how over the impending hazards and unavailability of safe work environment.

In this context, it is suggested that (I) Welders should be provided with proper vocational guidance on the imminent dangers of their occupation; (II) Welders should be screened for health problems at definite intervals and timely treated as a rule; (III) A proper inspection of the industrial environment, working conditions, sanitation and illumination standards by the authority is necessary before license is availed; and (IV) It should be followed by periodical inspections.

Conflict of Interest

This is to certify that there was no sponsor for the study and the study design; collection, analysis, and interpretation of data; writing the report; and the decision to submit the report for publication rest on the authors of this manuscript. We had full access to all of the data in this study and we take complete responsibility for the integrity of the data and the accuracy of the data analysis.

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Relationship of Prevalence of Plantar Fasciitis to the Type of Flooring - A Community Based Observational Study

Binu M G¹, Mohammed Iesa², Vinodini C³, Nizar A⁴

¹Associate Professor, Dept of Medicine, Sree Mookambika Institute of Medical Sciences, Kulasekharam, KK Dist, Tamilnadu, ²Assistant Professor, Dept of Medicine, Sree Mookambika Institute of Medical Sciences, Kulasekharam, ³Medical Officer, GH, Arumanai, Kanyakumari District, Tamilnadu, ⁴ESI Hospital, Puthiyakavu, Karunagappally, Kerala

ABSTRACT

Aim: To evaluate the relationship of plantar fasciitis with the type of flooring

Setting: A rural tertiary care centre.

Materials and method: 100 patients with physician diagnosed plantar fasciitis formed the cases and an equal number of people who never had plantar pain syndrome formed the control. Both groups were given a questionnaire and they were grouped according to the type of flooring.

Results: Among the plantar fasciitis group maximum number of people lived in cement or mosaic floored houses followed by marble floored houses and vitrified tile or marbonite floored houses. However on analysis of both patients and controls maximum prevalence of plantar fasciitis was noted among people living in marble floor houses. Least incidence was seen with wooden floored houses and old fashioned cow-dung floored houses.

Conclusions: Type of flooring does influence development of plantar fasciitis. Maximum incidence of plantar fasciitis was noted with people living in marble floored houses.

Keywords: Plantar fasciitis Flooring

INTRODUCTION

Plantar fasciitis, reportedly the most common cause of pain in the inferior heel, is estimated to account for 11 to 15 percent of all foot symptoms requiring professional care among adults.¹ In more than 80% patients the symptoms will disappear within a year, regardless of therapy.^{1,2} Plantar fasciitis is a syndrome caused by repetitive trauma at the origin of plantar fascia.² Because limited progress has been made towards preventing plantar fasciitis, treating symptoms is the mainstay in treatment.³ Conservative treatment such as stretching, icing, anti inflammatory use and short term use of foot orthoses is useful in reducing pain and improving function. Plantar fasciitis has got strong association with the type of occupation of a person.⁴ Plantar fasciitis is also related to BMI of the patient, with overweight persons suffering more than their normal weight counter parts.⁵ A strong relationship of plantar fasciitis is also reported in jobs

demanding prolonged standing.⁶ However, studies addressing the association of plantar pain syndromes and the type of flooring used at their place are lacking. The common man, i.e., the patients often attributes the plantar pain to the type of flooring they walk on. In our country, most of the people walk barefooted inside the home. Our custom prevents us from entering into kitchen and many other parts of the house with foot wears. There has been a steady increase in the incidence of plantar fasciitis over the years. And over the years the flooring pattern also has undergone revolutionary changes.

AIM OF THE STUDY

The aim of our study was to look at the possible relationship of occurrence of plantar fasciitis to the type of flooring on which the person spends most of his time. We also tried to derive out the safest type of flooring for prevention of plantar fasciitis.

MATERIALS AND METHOD

We included 100 patients presented to our OP with plantar pain and diagnosed as having plantar pain by a physician or orthopaedician. Overweight patients with BMI>25 were excluded. Age group ranged from 32 to 75. Majority of the patients were females (62). Those with the habit of using footwear at home were excluded. The control group was formed by patients attending general medical OP with other complaints. Similar exclusion criteria were used for controls also. Age group of controls also matched that of patients (35-70). Those who had ever suffered from significant plantar pain syndromes were excluded from the study. Both the groups were given a questionnaire and were grouped according to the type of flooring in their houses. The type of flooring in each group was analyzed and the prevalence of plantar fasciitis in each flooring group was analyzed.

The statistical analysis was done using SPSS statistical package.

The patients were advised treatment with physical measures, anti-inflammatory drugs, special foot wears, foot exercises etc.

RESULTS

Among the plantar fasciitis group maximum number of people lived in cement or mosaic floored houses(57%) followed by marble floored houses(36%) and vertified tile or marbonite floored houses(7%). However on analysis of both patients and controls maximum prevalence of plantar fasciitis was noted among people living in marble floor houses. Least incidence was seen with wooden floored houses and old fashioned cow-dung floored houses, how ever the numbers were too small and there were no patients in those groups!

Table1: Type of flooring

	Cement/ mosaic	Marble	Vitrified tile/ marbonite	Wooden floor	Cow dung floor
Patients	57	36	7	0	0
controls	70	21	5	2	2

Table 2: Plantar fasciitis in people living in cement or mosaic floored houses

Total number of people	Plantar fasciitis	No plantar fasciitis	% of plantar fasciitis
127	57	70	44.88

Table 3: Plantar fasciitis in people living in marble floored houses

Total number	Plantar fasciitis	No plantar fasciitis	% of plantar fasciitis
57	36	21	63.16

Table 4: Plantar fasciitis in people living in vitrified tile or marbonite floored houses

Total number	Plantar fasciitis	No plantar fasciitis	% of plantar fasciitis
12	7	5	58.33

(Sample too small to be statistically significant.)

CONCLUSIONS

1. Type of flooring do influence development of plantar fasciitis.
2. Maximum incidence of plantar fasciitis is among people living in marble floored houses.
3. Older types of floorings may be more protective for plantar pain syndromes.

DISCUSSION

There have been a few studies looking at the epidemiology of plantar fasciitis. Ryan GA conducted a study on incidence of musculoskeletal disorders of lower limbs in supermarket workers.⁵ Those who were working with more time in standing posture had maximum incidence of musculoskeletal problems of foot. Riddle et al reported relation ship of plantar fasciitis with jobs involving prolonged standing.⁶ They

also reported a relationship between plantar fasciitis and high BMI. Dawson et al reported a relationship between plantar fasciitis and the number of years spent lifting weights.⁷ Engels et al reported relationship of plantar fasciitis with BMI.⁸ They also reported an increased incidence in females. Akesson I et al also reported a high incidence of plantar fasciitis in women.⁹ Bergenudd et al reported higher incidence in females.¹⁰ They also reported higher incidence among patients who are over weight and among higher social class. Probably the increased incidence noted in higher social class may be related to the modern floorings in their homes. Overall it appears that high BMI, prolonged standing and high physical workload may be associated with plantar fasciitis. However these observed associations are not adjusted for floor surfaces and type of foot wear. Charm R et al have reported the effects of type of flooring on standing comfort and foot fatigue.¹¹ However plantar fasciitis was not specifically studied here. Redfern MS also reported the effect of flooring on standing comfort.¹² Redfern MA et al also have reported the effects of flooring on standing comfort and fatigue.¹³ As per our knowledge, this is the first study actually looking at the relationship of plantar fasciitis with the type of flooring. We do wish that further works are done in this field and a metaanalysis will answer many of our yet to be answered questions.

Conflict of Interest

Like any study, ours also has its limitations. We recognize that some baseline characteristics were different between the two groups. We adjusted the statistical analysis to address this issue.^{14, 15} We have tried our level best to avoid any bias in data collection.

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A Study of Fine Needle Aspiration Cytology as an Evaluation Tool in Head and Neck Masses

Chandrakanth V Rathod¹, Santosh Nagalika², Rekha³, G Prabhakar⁴, Satish Kumar⁵, Manjunath S⁶

¹Assistant Professor Dept. of Pathology, Navodaya Medical College and Research Hospital, Raichur, Karnataka,

²Assistant Professor, Dept. of ENT, Vydehi Institute of Medical Sciences, Bangalore, ³Consultant, Greenview Hospital,

Bangalore, ⁴Professor & Head, Dept. of ENT, Vydehi Institute of Medical Sciences, Bangalore, ⁵Associate Professor,

Dept. of ENT, Vydehi Institute of Medical Sciences, Bangalore, ⁶Assistant Professor of ENT, Vydehi Institute of Medical Sciences, Bangalore

ABSTRACT

Background and objectives: Masses in head and neck region are a common clinical problem. The clinical evaluation of head and neck masses can be difficult because of anatomical peculiarities, proximity of tissues of various types and wide range of primary and metastatic neoplasm of these areas. The aim of pre-operative and pretreatment investigation is to arrive at a precise and whenever possible type specific diagnosis.

The conventional surgical histopathological examination is considered as confirmatory test. So arise the need for a technique which is less invasive and with less complication, so that treatment can be directed early.

Materials and method: A prospective study was done in department of Pathology from Feb 2008 to Aug 2010. The patients presenting to ENT OPD were subjected to FNAC, whenever possible, these patients were subjected to histopathological study by biopsy. Only those cases, which were subjected to, FNAC and Biopsy, were taken for the study. All cases were examined in detail regarding site, size, and consistency of swelling. Acute inflammatory conditions like neck abscesses and nasal masses like polyps were excluded from the study.

Results: Fifty cases were studied and data were analysed. 27 patients were females and 23 were males. Of the 50 cases 5 (10%) were seen in nasal cavity, 2 (4%) cases were seen in maxillary sinus, 12 (24%) cases were in oral cavity, 11 (22%) in salivary glands i.e. in parotid 6 (12%), 5 (10%) in Submandibular gland, 10 (20%) were in thyroid, 10 (20%) in neck i.e. including both lymph nodes and soft tissue swellings.

Conclusion: Fine needle aspiration cytology (FNAC) is a rapid, cost effective and simple out patient procedure which can be performed safely. It has high accuracy rate for head and neck masses. FNAC is the first step of pathological examination in all head and neck masses. In primary diagnosis, accuracy varies with site of lesions, the tissue of origin and the nature of the process. Clinically FNAC should only be used as a guide for preliminary diagnosis, especially in malignant pathologies. Final treatment decision should not be made according to the results of FNAC and tissue biopsy should be obtained before definitive treatment.

Keywords: FNAC, Head and Neck, Biopsy

INTRODUCTION

Masses in head and neck region are a common clinical problem. The clinical evaluation of head and neck masses can be difficult because of anatomical

peculiarities, proximity of tissues of various types and wide range of primary and metastatic neoplasm of these areas. The aim of pre-operative and pretreatment investigation is to arrive at a precise and whenever possible type specific diagnosis.

The conventional surgical histopathological examination is considered as confirmatory test. So arise the need for a technique which is less invasive and with less complications, so that treatment can be directed early especially in in-operable cases where radiotherapy or chemotherapy can be started without interfering tissue planes.

Fine needle aspiration cytology, is of particular relevance in head and neck area because of easy accessibility of target sites. Fine needle aspiration cytology in this region is easy because of excellent patient compliance, due to minimally invasive nature of the technique and importance of avoidance of surgery in situations like non neoplastic or inflammatory and metastatic tumors. FNAC also affords a practicable and means of rationally planning surgery.^[1] Cytological diagnosis can be practiced on almost any anatomic region evident visually, for example skin or sub cutis of the face, external nose or nasal cavity, floor of mouth, tongue, palate, tonsils and the posterior pharyngeal wall.^[2,3] The developmental cysts like brachial and thyroglossal have also been successfully diagnosed.^[4]

This work attempts to evaluate the role of FNAC in the diagnosis of head and neck masses in comparison with histopathological examination.

HISTORICAL REVIEW

The study of cytological technique in diagnosis of various diseases dates back to the middle of Nineteenth century.

The purpose of aspiration cytology is to obtain diagnostic material for cytological study. Wide bore needle of 16-18G was used by Meatherinham R.E and Ackerman (1947) for aspiration biopsy from lymph nodes.^[5] The use of fine needle technique virtually eliminates the traumatic and other complications that may occur in surgical biopsy.^[6] For aspiration cytology the lesion must be accessible and within reach of the needle.

Various studies have been done to find out correlation between cytological and histopathological evaluation.^[7,8,9] Fine needle aspiration cytology is found as effective tool for the diagnosis and triage of patients with head and neck masses.^[11,12] 95 percentage of fine needle aspiration cytology of head and neck specimens

shows adequate tissues for histological evaluation.^[10,11] The diagnostic accuracy of fine needle aspiration cytology was better with salivary gland and cervical nodes than with thyroid, skin, and subcutaneous specimens.^[12,13]

MATERIALS AND METHOD

The present study of role of FNAC in head and neck masses was done in the department of pathology, in collaboration with department of ENT. The period of study covered was from Feb 08 to Aug 10. The patients presenting to ENT OPD were subjected to FNAC, whenever possible, these patients were subjected to histopathological study by biopsy. Only those cases, which were subjected to, FNAC and Biopsy, were taken for the study. All cases were examined in detail regarding site, size, and consistency of swelling. Acute inflammatory conditions like neck abscesses and nasal masses like polyps were excluded from the study.

ESTIMATION OF SAMPLE SIZE

Sample size is estimated by using 5% significant level and 10% allowable error. In this study efficacy of the test is taken as 90% i.e. the average of sensitivity and specificity of the test.

Hence $p = 90\%$

$q = 10\%$

Sample size $n = \frac{Z^2 \cdot p \cdot q}{E^2}$

Where Z is normal deviate; for 5% it is 1.96

$E = 9$ for 10% error

Hence nuptial = $\frac{(1.96)^2 (90) (10)}{9^2}$

$N = 43$

This is rounded off to 50 cases.

RESULTS

Sex Distribution

In this series of 50 cases 27(54%) were female and 23 (46%) were male.

Table. 1 Showing Sex Distribution

Sex	Frequency	Percent
Female	27	54
Male	23	46
Total	50	100

Table. 2 Showing Number of Cases from Different Areas

Sl. No.	Site of Lesion	No of Cases	Percentage
1	Nasal Cavity	5	10%
2	Maxillary Sinus	2	4%
3	Oral Cavity	12	24%
4	Salivary Glands	11	22%
5	Thyroid	10	20%
6	Neck Swellings	10	20%
	Total	50	100%

In this series 5 cases were in the nasal cavity (10%), 2 cases (4%) were in the maxillary sinus, 12 cases (24%) were in the oral cavity, i.e. in the buccal mucosa, soft palate, floor of mouth, 11 cases (22%) were in the salivary glands mainly in the parotid (6) and Submandibular glands (5), 10 cases (20%) were in the thyroid, 10 cases (20%) were neck swellings which included both lymph nodes as well as soft tissue swellings.

FREQUENCY OF LESIONS IN THE ORAL CAVITY

Seven cases were in buccal mucosa, 2 were in tongue, 2 were in palate and one was in floor of mouth

FREQUENCY OF LESIONS IN NECK

Five swellings were lymphnodes and five were soft tissue swellings.

CLINICAL DIAGNOSIS

In these 50 cases 35 cases were diagnosed clinically as benign lesions and 15 cases as malignant lesions. The cytological study helps to know whether a lesion is benign or malignant. The procedure can also be done safely in the presence of infection and helps to differentiate between inflammatory conditions and tumors if smears are cellular.

TYPE OF LESIONS IN SALIVARY GLANDS

In the salivary glands, four cases in the Submandibular gland were inflammatory and one was adenoma, in parotid gland 6 were Pleomorphic adenoma.

TYPE OF LESIONS IN ORAL CAVITY

Six lesions in the buccal mucosa were malignant and 1 was benign, 1 palatal swelling was minor salivary gland adenoma and one was carcinoma. Of

the tongue swelling one was carcinoma and one was cysticercosis. Swelling in the floor of mouth was ranula.

TYPE OF LESIONS IN THE NECK

In the lymph nodes 3 were Hodgkins Lymphoma, one was non-specific lymphadenitis and one was tuberculous lymphadenitis. In the neck soft tissue swellings two were thyroglossal cysts, one was epidermal cyst, one was brachial cyst and one was lymphatic cyst.

TYPES OF LESION IN THYROID GLAND

In the thyroid swellings three were malignant, one anaplastic, one papillary one follicular carcinoma. Seven were benign, 5 follicular adenomas, and two were multinodular goiter.

TYPES OF LESION IN NASAL CAVITY

In the nasal cavity two were benign, one angiomatous polyp, one chronic inflammation, three were malignant.

SENSITIVITY OF FNAC

Out of 50 cases, FNAC showed positive cytology in 43 cases, in 7 cases it showed negative cytology

Table. 3. Showing Sensitivity of Fnac

Sensitivity	Frequency	Percent
Positive	43	86
Negative	7	14

Table 4. Showing Fnac* Biopsy Cross Tabulation

FNAC	BIOPSY		TOTAL
	Positive	Negative	
+	a (True Positive)	b (False negative)	a+b
-	c (False negative)	d (True negative)	c+d
total	a+c	b+d	N

In this study

FNAC	+	̂	total
+	43	0	43
-	7	0	7
	50	0	50

SENSITIVITY

$$\text{Sensitivity} = \frac{\text{True Positive}}{\text{Total a/a+c}}$$

$$\frac{43}{50} = 0.86$$

86%

DISCUSSION

Table 5. Showing Corelation Between Sites of Lesion &Fnac

SITES OF LESION		FNAC		TOTAL
		NEGATIVE	POSITIVE	
Nasal cavity	Count	3	2	5
	%within site	60%	40%	100%
Sinus	Count	0	2	2
	%within site	0%	100%	100%
Oral cavity	Count	3	9	12
	%within site	25%	75%	100%
Salivary Glands	Count	0	11	11
	%within site	0%	100%	100%
Thyroid	Count	1	9	10
	%within site	10%	90%	100%
Neck Swelling	Count	0	10	10
	%within site	0%	100%	100%
Total	Count	7	43	50
	%	14%	86%	100%

In the present study highest diagnostic accuracy was in cases of salivary glands and neck swellings (100%). Even though FNAC showed positive results in case of maxillary antrum, the number of cases were too small to be commented. Diagnostic accuracy is least

in nasal cavity lesions where it is difficult to fix the mass for the procedure. The cases on FNAC showed negative results due to hemorrhagic smear, inability to opine regarding malignancy as cytological features were not clear.

Table 6. Showing Correlation Between Fnac & Type of Lesion

Site of Lesion	Type of Lesion					Sensitivity		
	Benign		Malignant		Total	Benign	Malignant	Toal
	positive	negative	positive	negative				
Nasal Cavity	1	2	1	1	5	33%	50%	41.5%
Sinus	0	0	2	0	2	-	100%	100%
Oral Cavity	6	0	3	3	12	100%	50%	75%
Salivary Glands	11	0	0	0	11	100	-	100%
Thyroid	7	0	2	1	10	100%	66.6	83.3%
Lymphnode	2	0	3	0	5	100%	!00%	!00%
Neck Soft tissue swelling	5	0	0	0	5	100%	-	100%

This table shows that, FNAC could detect 33% of benign lesions and 50% of malignant lesions. In the maxillary sinus both the cases were malignant and FNAC detected both positively. While in oral cavity FNAC was positive in all the benign lesions, but in malignant lesions only 50% were positive. FNAC was positive in all cases of salivary gland lesions. In case of thyroid gland, FNAC was positive in all benign cases, while it failed to detect one case of follicular carcinoma. FNAC was positive in all cases of neck swellings both lymph nodes as well as soft tissue swelling.^[12,13]

In case of oral cavity diagnostic accuracy had been reported to be the order of 88 -90%.^[2] The cases of

negative cytology is mostly due to hemorrhagic aspirate and less cellularity

In case of thyroid various authors believe that, FNAC should be performed on each solitary nodule at the time of its discovery as the first step to diagnosis.^[14,15,16] The follicular carcinoma of well differentiated pattern and follicular adenoma show similar cytological pattern. Thus histopathological examination for capsular infiltration is essential. Only those follicular carcinomas showing marked cellular pleomorphism and nuclear hyperchromatism can be diagnosed as carcinoma. Thus value is limited in case of neoplasm due to necessity of detecting capsular infiltration.^[18,17]

The present study showed high diagnostic accuracy in case of neck swellings.^[4,19] Regarding Hodgkin's disease many authors reported near hundred percent accuracy.^[17]

TYPES OF BIOPSY

This study shows biopsy was a major procedure in 30 cases and minor in 20 cases.

Table 7. Showing Fnac* Biopsy Cross tabulation

FNAC	BIOPSY		TOTAL
	Positive	Negative	
+	a (True Positive)	b (False negative)	a+b
-	c (False negative)	d (True negative)	c+d
Total	a+c	b+d	N

In this study

FNAC	+	î	total
+	43	0	43
-	7	0	7
	50	0	50

SENSITIVITY

$$\text{Sensitivity} = \frac{\text{True Positive}}{\text{Total}}$$

$$a/a+c$$

$$43/50=0.86$$

$$86\%$$

Table 8. Showing Comparision Between Earlier Studies and Present Study.^[20,17]

Sl. No.	Authors	No of Csaes	Sensitivity
1	Kline, Neal H.S et al (1978)	305	94
2	John Webb et al (1978)	230	93
3	Mondal.A,B.K Roychoudhary et al (1992)	1082	96.2
4	Andleeb Abrari et al (2002)	150	93
5	Present Study	50	86

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Prevalence and Type of Tobacco Habits and Tobacco Related Oral Lesions among Wayanad Tribes, Kerala, India

Deepa KC¹, Jose M², Prabhu V³

¹Senior Lecturer, Department of Oral Pathology and Microbiology, Kannur Dental College & Hospital, Kerala,

²Professor & Head, ³Professor, Department of Oral Pathology and Microbiology, Yenepoya Dental College and Hospital, Karnataka

ABSTRACT

Background: A positive correlation exists between tobacco habit and education & socio-economic status of individuals. The baseline study revealed that, Wayanad tribal population being a community which is falling behind the rest of population of Kerala in terms of literacy, income and health, spend a significant portion of their income on tobacco. As there is no information about actual prevalence of tobacco habits and related oral mucosal lesions, the present study was designed to record the related details.

Methodology: Total of 523 individuals belonging to the age group 10-80 years were selected randomly from different tribal groups of Wayanad district of Kerala. Selected individuals were personally interviewed in local language and subsequently oral examination was carried out to note the details. Results obtained were analysed statistically.

Results: Out of 523 participants, 445 (85.1%) were consuming tobacco in one form or other. 91.3% of tobacco users were males and 79.3% females with relatively equal distribution among different communities. Different types of habits observed were chewing, smoking and Snuff of which chewing was found to be more prevalent (60.1%). Various tobacco related oral mucosal lesions observed among the study populations were Leukoplakia 93 (17.8%), Oral submucous fibrosis (OSMF) 38 (7.2%), Oral squamous cell carcinoma(OSCC) 2(0.4%), and Chewers mucosa 61 (11.7%).

Conclusion: Prevalence of tobacco habits and related oral mucosal lesions are high among the tribes of Wayanad. Their ignorance about the adverse effect of tobacco is highly alarming and special attention from government and health professionals is required for improving the health awareness and welfare of this tribal community.

Keywords: Tobacco Habits, Tobacco related oral lesions, Wayanad tribes

INTRODUCTION

Wayanad is the least populated district of Kerala state, India and its population constitutes 2.47% of

Kerala's total population. Tribal community constitutes 17% of population of Wayanad. There are six main tribal communities - Paniyan, Adiyan, Kattunaickkans, MulluKurumans, UraliKurumans and Kurichians. The baseline study revealed that tobacco related adverse oral habits are common among these tribal communities and a significant portion of their income is spent on tobacco and alcohol.¹

The habit of tobacco consumption has been clearly associated with potentially malignant diseases of oral

Corresponding author:

Deepa KC

Senior lecturer

Department of Oral Pathology and Microbiology,

Kannur Dental College & Hospital

Kerala, India-670612

Email: deepa8185kc@gmail.com

cavity and its use is considered as the major etiological factor for development of oral cancer. Therefore special attention is required for improving the awareness about adverse effects of tobacco among this population.^{2,3,4} For initiating any anti-tobacco campaign in the tribal communities, proper data is required regarding the prevalence of tobacco habits. Although it is documented that tobacco related habits are common among tribes, there is no scientifically validated data available on types of habits and prevalence of related oral lesions among Wayanad tribes. Therefore the present study is designed to identify the prevalence and type of tobacco and related adverse oral habits and occurrence of habit related mucosal lesions among the tribes of Wayanad district, Kerala.

METHODOLOGY

Data collection: This study was conducted among tribal population of Wayanad district, Kerala, India to identify the type and prevalence of tobacco habits and related oral lesions. Study was carried out during the period February to May 2011. During this period the investigators did a house to house visit to different tribal community.

Questionnaire: The WHO Oral Health Assessment Form was used as a basis of a questionnaire and clinical assessment form. The questionnaire was constructed and administered in local language, i.e. Malayalam. The questionnaire included information on general status of the patient, oral hygiene methods, dental status and tobacco habits.

Patient population: 523 individuals (252 males & 271 females) belonging to the age group between 10- 80 years were selected for the purpose of documentation of tobacco habits and related oral lesions if any. Random sampling technique was adopted for selecting the study subjects and mainly subjects from 6 tribal communities namely Paniyan, Adiyan, Kattunaickkans, MulluKurumans, UraliKurumans and Kurichians of Mananthawady & Vythiritaluk were included in the study. Details obtained were recorded in a modified WHO Proforma.

Clinical examination: Prior to the examination, individuals were asked to rinse their mouth thoroughly with water and was examined under an incandescent

light source. After the interview, a detailed oral examination was carried out with the help of diagnostic instruments, to record habit related oral mucosal lesions if any. The clinical diagnosis was established and classified according to the Epidemiology guide for the diagnosis of oral mucosal diseases (WHO).

Statistical analysis: The collected data were compiled and analyzed using statistical tests: Chi Square test & ANOVA test.

RESULTS

A total of 523 individuals of different tribal communities participated in the study, out of them 252 (48.2%) were males & 271 (51.8%) were females. Among the participants, 445 (85.1%) were consuming tobacco in one form or other and only 78 of them (14.9%) were not using tobacco. Prevalence of tobacco habits were 91.3% in males and 79.3% in females with relatively equal distribution among different communities.

Prevalence of tobacco chewing habit was recorded 60.1%. Out of 445 people who were consuming tobacco, 312 were using chewable form of tobacco in which 99 (31.7%) were males and 213 (68.2%) were females. Tobacco chewing habit was more prevalent in females (78.6%) when compared to males (39.3%). This difference was statistically very highly significant ($P < 0.001$). Most of the tobacco chewers (70.8%) were using traditional betel quid containing different ingredients such as betel leaf, areca nut and slaked lime along with tobacco while 27.2% of them were using commercial tobacco and a minor group (1.9%) used tobacco alone (Table 3).

Total prevalence of smoking habit noted was 5.3% and majority of smokers were males (90%) of different age groups. Out of 230 men with tobacco habits, 28 (12.1%) were smokers. Most of them were using Bidi compare to Cigarette. But out of 215 tobacco using ladies, none of them were smokers and 3 (1.4%) females had combined habit of smoking and chewing (Table 1 & 2). In addition, among 445 tobacco users 21 (4%) were using snuff i.e. powdered tobacco, 82 (15.6%) were using both chewing & smoking, 1 (0.1%) were using both chewing & snuff and 6 (1.1%) were having all three habit.

Table 1: Distribution of habits among different tribal communities

Types of habits	GROUP						Prevalence of habits among 523 individuals
	Kattunaikar	Adiyan	Kurichian	Kuruman	Paniyan	UraliKaruman	
Smoking	2(7.1%)	6(21.4%)	8(28.6%)	3(10.7%)	8(28.6%)	1(3.6%)	28 (5.3%)
Chewing	55(17.6%)	68(21.8%)	53(17.0%)	33(10.6%)	87(27.9%)	16(5.1%)	312 (60.1%)
Snuff	13(61.9%)	2(9.5%)	0(0%)	3(14.3%)	3(14.3%)	0(0%)	21 (4%)
Smoking & Chewing	25(30.5%)	16(19.5%)	12(14.6%)	5(6.1%)	21(25.6%)	3(3.7%)	82 (15.6%)
Chewing & Snuff	1(100.0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	1 (0.1%)
All Three	5(83.3%)	0(0%)	0(0%)	1(16.7%)	0(0%)	0(0%)	6 (1.1%)
Total habits Total tribes screened	101(95.2%)106	92(92%)100	73(65.1%)112	45(78.1%)57	119(94%)126	20(90%)22	445 (85.1%)523

p<0.001 very highly significant

Table 2: Gender wise distribution of habits

Type of habit	Gender		Prevalence of habits among 523 individuals
	M(Out of total no of male 252)	F(Out of total no of female 271)	
SmokingCount& %	28 (11.1%)	0(0%)	28(5.3%)
Chewing	99(39.3%)	213(78.6%)	312(60.1%)
Snuff	19(7.5%)	2(0.7%)	21(4%)
Smoking & Chewing	79(31.3%)	3(1.1%)	82(15.6%)
Chewing & Snuff	1(0.3%)	0(0%)	1(0.1%)
All Three	6(2.3%)	0(0%)	6(1.1%)
Total	232	218	445(85.1%)

p<0.001 vhs

Table 3: Types of ingredients used by tribal population

Ingredients	Totalcount	Percentage% out of 312 chewers
Areca nut+ betel leaf+ tobacco(Commercial tobacco products)	85	27.2%
Betel leaf+tobacco + slaked lime +areca nut (Traditional tobacco quid)	221	70.8%
Tobacco alone	6	1.9%

p<.001 vhs

The prevalence of tobacco related oral mucosal lesion in 523 individuals, 93 (17.8%) were Leukoplakia, 38 (7.2%) Oral submucous fibrosis(OSMF), 2 (0.4%) Oral squamous cell carcinoma(OSCC), and 61 (11.7%)

Chewer's mucosa (Fig 1 & Fig 2).The lesions were found to be equally distributed among both males and females and among different communities.



Fig. 1. Tobacco related oral mucosal lesions among Wayanad tribes A) Oral squamous cell carcinoma (SCC) on corner of mouth B) Chewers mucosa on cheek mucosa C) Leukoplakia on corner of mouth D) Oral submucous fibrosis (OSMF)

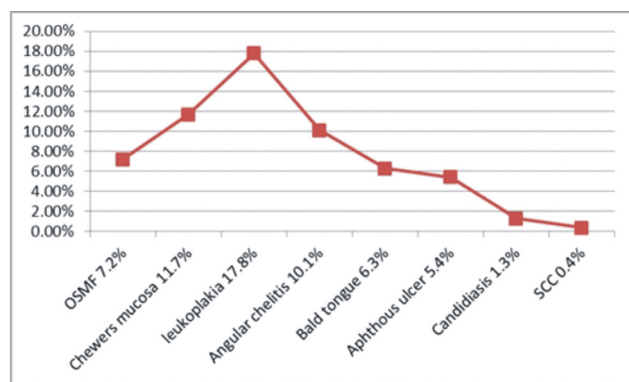


Fig. 2. Prevalence of tobacco related oral mucosal lesions among Wayanad tribes

DISCUSSION

Oral cavity is a miniature screen of whole body and a lesion which is present in oral cavity may indicate the total health or habits of the individual.^{5,6} It is highly alarming that tobacco products which were usually consumed by a small section of the population have become a part of the modern urban and rural lifestyle today and even children of school going age are getting into these habits.⁷ It is well known that chemical constituents of tobacco are carcinogenic and cause various mucosal lesions ranging from chewers mucosa to potentially malignant lesions which may progress to oral cancer. Early detection and cessation of these habits can save people from life threatening tobacco-related oral malignancies.⁸

Wayanad is a least populated district of Kerala and tribal population constitute 17% of total population of

the district. Majority of the tribes (88%) were in the low-income group with an annual income of Rs.10,000. The Wayanad tribes in the study area are residing in the 'poverty square' of India with poor state of literacy. The tribal population in the study area were small landholders, tenants and landless labourers, who fulfil their subsistence requirements of fuel and fodder from Common Property Resources.¹

Our study revealed that 85% of study population were using tobacco in one form or other, indicating the high prevalence of tobacco habits among Wayanad tribal population. Among the different tobacco habits use of traditional quid was more common (60.1%) than other habits such as smoking and snuff which were used by relatively less percentage of people, 5.3% and 4% respectively. Prevalence of tobacco habits were 91.3% in males and 79.3% in females with relatively equal distribution among different communities.

High prevalence of tobacco habits among these different tribal populations without any gender distinction could be due to various reasons. We have observed that the socio-economic status of these populations is very low with the educational status of most of the participants were only of primary level and most of them were ignorant about adverse effects of tobacco. In addition tribes who depend on home remedies for various health problems considered tobacco as a single and most important antidote for all kinds of dental and oral diseases. Due to this tobacco was introduced to most of the individuals at a very early age of life and would get habituated to tobacco use later. More over tobacco habits are socially accepted among tribes and is rather encouraged by elders. This would also explain why the tribal people get in to tobacco habits at relatively early age.

Due to paucity of similar studies among Wayanad tribal population, we could not make a direct comparison of our results. However Jayadevan S had reported a similar high prevalence of tobacco habits in tribal population of northern part of Kerala, who had also noted that smoking habit is prevalent in males and chewing habits in females.⁹ Likewise there are few other reports on tribes of other regions of India.^{10,11,12}

It is interesting to note that majority of the tribal population, both males and females; still use traditional betel quid i.e. self-prepared quid containing tobacco leaves, areca nuts, betel leaves & lime. Tobacco smoking and use of commercial products such as gutkha were more prevalent among males who travel nearby towns for other works such as taxi drivers and

construction works and they were exposed to the people of other communities. Significantly less female predominance in consuming commercial tobacco products could be due to lack of access to the shops as they are involved mainly in household work and do not mix up with other community people. Although not in tribal population, Chen JW & Shaw JH had reported that males tend to use more of commercial tobacco product as compared to females and females prefer the traditional form of habit where quid can be prepared at home.¹³

While comparing the tobacco habits among six different tribal communities, it is found that these habits were more among Kattunaikans (95.2%), Adiyans (92%), Paniyans (94%), Uralikuruman (90%) and although not statistically significant, relatively less among Kurichians and Kurumans (65.1% & 78.1% respectively). This indicates that tobacco habit is also related with life style and behaviour. Kurichian & Kuruman are land holders, with better educational levels and relatively better way of life style and are more aware about health and diseases. Our observation is in accordance with the study of Gupta PC and Kow TC et al who have reported a correlation between tobacco habit and education & socio-economic status.^{14,15}

Out of 445 traditional tobacco users 194 people had shown tobacco related oral mucosal lesions. The most commonly observed lesion was leukoplakia which was noted in 93 people with a prevalence rate of 17.8% which is high when compared to general population.¹⁶ Other lesions such as Chewers mucosa (11.7%) OSMF (7.2%) and SCC (0.4%) were also noted. Few individual also showed lesions unrelated to tobacco like angular cheilitis (10.1%), bald tongue (6.3%), aphtous ulcer (5.4%), and oral candidiasis (1.3%). Results obtained in our study are consistent with the previous studies.^{17,18}

However mucosal changes were observed in lesser extent compared to widespread use of tobacco. This could be due to the fact that most of them were using traditional quid that has betel leaf as a major ingredient which is rich in antioxidants and is protecting from adverse effects of tobacco carcinogens. Our findings are consisted with that of Reichart PA et al¹⁹ & Gupta PC et al¹⁴ who reported that long term use of chewing of tobacco with areca nut, betel leaves and lime results in later onset of the disease compare to commercial products. This could be because of the anti-oxidant, protective and medicinal benefits of betel leaf used in betel quid.²⁰

CONCLUSION

To summarize Tobacco habits and tobacco-related oral mucosal lesions are highly prevalent among Wayanad tribal population. As they are residing in the 'poverty square' of India, the socioeconomic condition of this population is very poor and the same is reflected in tobacco habits. Their ignorance about the adverse effect of tobacco is highly alarming and this has led to high prevalence of these habits and related lesions. However, it was observed that tribal communities reside in remote areas from where the primary health centre is located. For overcoming these problems, the government support and involvement of local dental health professionals is need of the hour. More primary health centres which are easily accessible for them should be opened and they should be educated about the ill effects of tobacco.

ACKNOWLEDGMENT

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Conflict of Interest: Nil

ETHICAL CLEARANCE

Permission was obtained from the institutional ethical committee of Yenepoya University, Mangalore and a written permission from the District collector of Wayanad and the Tribal welfare officer.

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Banned Medicines Menace: A Peril to Public Health

Vela Desai¹, Dipika Bumb², Durgesh N Bailoor³

¹Professor & Head of Department, ²Postgraduate Student, III Year, Department of Oral Medicine & Radiology, Jaipur Dental College, Jaipur, Rajasthan, ³Professor and Head of Department, Department of Oral Medicine & Radiology, Karnavati Dental College, Ahmedabad, Gujarat

ABSTRACT

Medical tourism and pharmaceutical boom are remarkable achievements of India over other countries due to hospitality, low cost quality treatment plans, easy research methodologies & less medico legal implications. Despite such major global responsibility, India is becoming a hub for the availability and usage of banned medicines. The proliferation of banned and harmful drugs in India is a serious problem for the health of people and there is an urgent need to curb it. A drug is banned on the basis of risk versus benefit ratio which is evaluated through post marketing surveillance and adverse drug reaction reporting systems. The medicines which have been labeled as silent killers overseas are making their space in India, indicating lack of knowledge among doctors and inefficient government policies. Drugs play a crucial role in saving lives, restoring health, preventing diseases and epidemics. When drug itself is harmful, it poses additive danger to the patient. Availability of such medicines over the counter is a grave problem. Medical profession is getting defamed and crippled in India because of various factors like self medication, unethical drug promotion, medical commercialization and unawareness among doctors. Until such issues are not sorted out the existing situation would prevail.

Keywords: Drug Development, Adverse Drug Reaction, Banned Medicines, Ayurvedic Medicine, Heavy Metals

INTRODUCTION

Medicines are the backbone of a doctor's prescription that alleviates the illness of the patient. But, is your medicine killing you? This question should arise in every Indian's mind before taking any medicine either from the chemist or prescribed by the doctor. Some drugs are making their space in the Indian market on a large scale due to lack of awareness of this serious situation that is strengthening its roots in the pharmaceutical industry as well as medical/dental profession. This article is focused on why these drugs are banned in other countries and their associated harmful effects on the body. A drug is a substance used in the diagnosis, treatment, prevention of a disease or as a component of a medication. While no drug is considered 100% safe, banning of any drug in a country is based on a risk versus benefit assessment process undertaken by Governments in consultation with experts and still the drugs available in the market continue to be evaluated through post marketing surveillance (PMS) and adverse drug reaction reports (ADR).^[1]

Drug development

Discovery of a drug is the process of invention and designing of drugs that comprises of target identification and its validation, lead identification, lead optimization and introduction of new molecules for the welfare of human beings i.e. those with high market requirement and varied therapeutics.^[2] A drug has to go through rigorous processes like in vitro studies (trials), animal testing, and toxicity tests to test the accuracy, reliability and reproducibility of a drug before it is introduced in the market. Certain new trails like the "Phase 0" also known as human microdosing studies are designed to speed up the development of promising agents to test the outcome on human subjects as was expected from the clinical outcomes.^[3] WHO defines pharmacovigilance as the science and activities related to the detection, assessment, understanding and prevention of ADRs or any other, medicine-related problem.^[4] Post Marketing Surveillance Trial (phase IV) finally involves the pharmacovigilance and ongoing technical support of a drug after it receives permission to be sold.

Harmful effects discovered by Phase IV trials may result in a drug being no longer sold, or restricted to certain uses: recent examples involve cerivastatin (brand names Baycol and Lipobay), troglitazone (Rezulin) and rofecoxib (Vioxx).^[5]

Adverse drug reaction reporting system

Adverse drug reactions have been a leading cause for morbidity & mortality in India. The severity of reactions can be estimated from mild to severe and various other types of reactions like augmented, chemical, delivery reactions.^[6] The Adverse Event Reporting System (AERS)- "MedWatch" is described as a computerized information database designed to support the FDA's post-marketing safety surveillance program for all approved drugs and therapeutic biologic products.^[7,8] A National Pharmacovigilance Programme was formulated in November 2004 to create awareness among the health professionals on ADR monitoring and to encourage a reporting culture, but Indian reports on such ADRs are very low due to lack of records and patient compliance.^[9] The incidence of adverse drug reactions varies with studies ranging from as low as 0.15% to as high as 30%.^[10] One of the classical example was for the lethal drug thalidomide (Contergan) which was immediately withdrawn from the market due to iatrogenic tetralogy i.e phocomelia in new born babies.^[11]

Such drugs can do more damage in a country like India where several people self-medicate and where drugs are sold without prescriptions. Also, the system of reporting adverse drug reactions is nearly non-existent in India. Doctors do not maintain proper patient records and also at times fail to seek patient information about use of certain medications. Without proper patient data, it is difficult to report any adverse drug reaction. So it's tough to say that a drug should be banned in India on the basis of adverse reaction reports.

Why and when should a drug be banned?

- Availability of efficacious & safer drugs
- Excessive toxicity
- When side effects are more dangerous than disease itself
- Irrational use
- Harmful interactions with food products or other medicines
- Inadequacy in management options

Current Indian Scenario

Some drugs are readily available for use with the chemist without prescription are known as over the counter drugs (OTC) and one of the most controversial drug is Nimesulide. It is a non steroidal anti inflammatory drug having analgesic & antipyretic properties. It is not used in USA, Finland, Spain, Bangladesh, Portugal, Singapore and Israel but is still used in India. Indiscriminate use of Nimesulide poses an alarming situation for India, due to its potential to cause hepatotoxicity along with other diseases like cholestasis, pruritis, colon cancer, coagulopathy.^[12] It is especially contraindicated in children, medically compromised patients and pregnant ladies. The market value of Nimesulide ranges over 250 millions, forcing the multinational companies to increase the production rather than cease its manufacture. Many of the doctors are not aware of the fact that due to toxicity, ADRs and suspected danger, Nimesulide was never licensed for use in developed countries. Small countries are Portugal, Israel and our neighbors like Sri-Lanka and Bangladesh have shown the guts and grit to withdraw the drug.^[13] It has been reported that certain laboratories whose branded Nimesulide reportedly accounts for a major share of domestic market, is believed to have withdrawn its pediatric preparation of Nimesulide from the market.^[14] Adverse drug reaction reports have been mentioned in the literature about its association with angina^[15] and increased risk in cardiovascular compromise by acting on the prostaglandin synthesis.^[16] According to Express India reports, the Union Ministry of Health and Family has finally given a firm decision for the pediatric use of nimesulide suspension on Feb 12, 2011. Such steps of self regulation should be highly appreciated by the doctors. Other drugs like, Metamizole sodium (Analgin) indicated for toothache, headache, arthralgia, neuralgia, high fever is banned as it may lead to progressive urticaria, edema, leucopenia, thrombocytopenia, proteinuria, interstitial nephritis. Celecoxib/Rofecoxib and Oxyphenbutazone are non steroidal anti inflammatory drugs increase potential chances of heart attack, stroke, allergies and bone marrow depression, GI ulcers respectively. Furazolidone (Lomofen, Dependal-M) and Nitrofurazone (Furacin) commonly used for diarrhea and as antibacterial, is banned worldwide as it may cause cancer, convulsions & depression of spermatogenesis. Commonly used Enteroquinol (Quiniodochlor) for dysentery and colitis may lead to Optic neuritis and atrophy.^[17] A dental infection treated with Oxytetracycline (Terramycin) can proceed to

reproduction failures or cancer. Cisapride indicated for acidity can make your heartbeat irregular, liver problems and teratogenicity.^[18] Anthelmintics like Piperazine are a major cause of nerve damage in such patients. Dripping nose or coughing throat? Did u take/prescribe Dcold/ Vicks action 500 (Phenylpropanolamine)? This deadly drug can cause dyspnoea, angioedema or stroke to you or your patients.^[19] Astemizole an antihistaminic drug has also been withdrawn from the market due to serious reports of ventricular arrhythmias, as stated by WHO newsletter.^[20] Spanish medical agencies also banned the use of this drug for the same cause.^[21] Terfenadine has also been banned in other countries due to fatal cardiovascular effects. Anti-bacterial Gatifloxacin may be banned or restricted by the drug technical advisory board. The decision regarding this was adopted by the Drug Technical Advisory Board (DTAB) in March 2010. Some other 'controversial' drugs which are being under the scanner of health ministry include the drug used for the treatment of infertility in women, letrozole; the emergency contraceptive drug, levonorgestrel (available as I-pill and Unwanted 72) as well as Placentex lotion and gel sold, which is a drug used for the extraction of human placenta. On the contrary, the youth of today is consuming the drug excessively without doctor's consultation and advertisements are being regularly given on television misguiding them in more than one ways. The DTAB will decide if the emergency OCPs should be banned as over-the-counter drugs. It will also decide if letrozole, which is currently a drug used in the treatment of breast cancer, can be used as an anti-infertility drug. In 2009, the DTAB banned anti-obesity drug, Rimonabant, on account of its serious side effects. This drug is sold in 18 countries and promoted in USA, is likely to cause adverse psychiatric reactions including suicidal thoughts and actions, neurological problems and seizures.^[22] Hypoglycemic agents like Rosiglitazone and Pioglitazone (Thiazolidinediones) are associated with an increased risk of edema and heart failure in patients with type 2 diabetes and are replaced by other class of drugs subsequently.^[23] Phenformin, an antihyperglycemic is also still available in India while it was withdrawn from the US market in 1977 due to its high incidence of associated lactic acidosis.^[24] Bisphosphonates like Pamidronate, Zoledronate, and Alendronate are linked to painful refractory bone exposures in the jaws i.e. osteonecrosis and should be banned for use.^[25] FDA has asked for the suspension of tegaserod following analysis of trial data showing adverse side effects such as heart attack and stroke.^[26]

Deanxiet, an antidepressant drug is under the scan of the health ministry as it causes addiction among users and certain other side effects.^[27]

Alternative medicine-Natural secrets to healing

Ayurveda provides a unique holistic approach towards management of a disease and holds great significance in the Indian civilization. These indigenous medicines can be harmful in various aspects as the botanical plants have poisonous characteristics which are difficult to differentiate and demonstrate.^[28] Such products are exported to countries like U.S.A, Europe that contains high levels of heavy metals like lead, arsenic, gold, cadmium. According to WHO, the maximum limits of heavy metals is Arsenic less than 10mg/kg, cadmium not more than 0.3 mg/kg and lead equals to 10 mg/kg.^[29] These metals have adverse side effects like arsenic poisoning can cause nausea, abdominal pain, vomiting, muscle cramps, heart abnormalities, liver damage, and anemia and reduced motor nerve function. Lead poisoning can cause weight loss, insomnia, dizziness, swelling of the brain and paralysis. Mercury poisoning can cause tremors, insomnia, memory loss, slowed sensory and motor nerve function and reduced mental function and gold bhasm can lead to even death. Some of the day to day used controversial ayurvedic drugs are Hamdard safi tonic, Maha sudarshan churna powder, Karela tablets.^[29,30] The drug regulation authorities should watch that the Levels of lead and arsenic are measured using Differential Pulse Anodic Stripping Voltammetry (DPASV) and Square Wave Voltammetry respectively.^[31] Ayurvedic medicines have severe drug interactions also like premenstrual syndrome and diabetic neuropathy are treated with prime rose oil that contains Gamolenic acid which lowers the seizure threshold of anticonvulsants. Shankhpushpi, reduces the potential of Phenytoin. Licorice is used as a remedy for peptic ulcers but it elevates the blood pressure and causes hypokalemia.^[32] Spectrums of other reactions are also seen with basic ayurvedic supplements and the Indian government should stop the marketing of these medicines via general stores and without prescription from a qualified doctor.

It is essential to inform prescribers, dispensers and the general public about the danger of these medicines. In certain countries medicines that have been banned or de-registered are still sold in the market illegally. Community based pharmco- vigilance programs should be formulated and public awareness should

be created with help of mass media in all languages and inculcation of such information in the curriculum of medical/ dental/paramedical courses will prove to be fruitful and harmonious. ^[33] Availability of such medicines needs to be surveyed and the drug regulatory authorities should take strict action against selling harmful de-registered medicines for the interest of individuals and the society. Therefore, the relevant authorities should take immediate actions by discontinuation of these medicines and should arrange information leaflets, public health campaigning for both doctors and common man regarding these medicines.

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In Vitro effects of Cadmium Chloride on Steroid Profiles of Post-vitellogenic Ovary in the Catfish *Heteropneustes Fossilis*

Radha Chaube¹, Surabhi Mishra¹, Rahul K Singh¹

¹Assistant Professor, Research Scholar, Zoology Section, Mahila Mahavidyalaya, Banaras Hindu University, Varanasi

ABSTRACT

Cadmium (Cd) is a known endocrine disruptor with the ability to affect the production of hormones involved in the regulation of reproductive processes. The purpose of this study was to evaluate invitro effects of cadmium chloride (CdCl₂) exposure on steroid levels in post-vitellogenic follicles of catfish ovary. Pieces of ovarian tissues (500mg) were incubated in culture medium in the presence or absence (control) of CdCl₂ (0,0.01,0.1,1,3 and 10µg/ml) for 12 or 24hr. Estradiol-17β (E₂) and testosterone were measured by ELISA. Other steroids like progestins (progesterone -P₄; 17-OH-progesterone -17-P and 17,20β-dihydroxyprogesterone -17,20β-DP) and corticosteroids (cortisol, 21-deoxycortisol, corticosterone and deoxycorticosterone) were quantified by High Performance Liquid Chromatography. The results show that Cd produced biphasic effects on E₂, T, P₄, 17,20β-DP, cortisol, deoxycorticosterone, and 21-deoxycortisol, stimulatory at lower concentrations and inhibitory at higher concentrations. In contrast, 17-P and corticosterone were inhibited in a dose-dependent manner. Thus, Cd can influence ovarian steroidogenesis adversely, affecting gametogenesis and ovulation resulting in the decline of fish population.

Keywords: Cadmium, Ovary, Invitro Steroid Levels, Endocrine Disruptors, Catfish

INTRODUCTION

Amongst vertebrates, fish are the most at risk of endocrine disruption since their aquatic habitat receives the greatest input of natural and anthropogenic pollutants. The use of fish as bioindicators of metal pollution and the suitability of fish for human consumption from a toxicological view have been documented⁽¹⁾. The accumulation of toxic metals to hazardous levels in aquatic biota has become a problem of increasing concern. Heavy metals such as copper (Cu), iron (Fe) and zinc (Zn) in trace amounts are essential for fish metabolism, whereas others, such as mercury (Hg), cadmium (Cd), arsenic (As) and lead (Pb), have no known beneficial role in biological systems⁽²⁾. Fish are, therefore, considered the most suitable animal model for the endocrine disruption related research. Endocrine disrupting compounds (EDCs) can obstruct reproduction of domestic and wild animals by acting at different levels of the reproductive system, causing structural and functional alterations. Metal-induced endocrine disruptions have been documented for various vertebrate groups. In recent years, considerably greater evidence has been accumulated for heavy metals like Hg, Cd and Pb in

mammalian and fish models^(3,4). Metals such as Cd have been shown to stimulate or inhibit gonadal steroid production in fish, depending on the dose and sex⁽⁵⁾. At the gonadal level, steroid hormones are very important and play essential roles in maintaining reproductive functions⁽⁵⁾. In mammals, it has been suggested that Cd acts at multiple sites in the intracellular signalling pathway of testosterone synthesis⁽⁶⁾. Cd was found to influence the activity of many enzymes including those which participate in the process of ovarian steroidogenesis^(7,8).

The purpose of the present study was to investigate the direct *invitro* effects of Cd on ovarian steroidogenesis. The results show that Cd elicited varied effects depending on the concentrations and duration of the incubations.

MATERIALS AND METHOD

Animal collection and acclimatization

Adult female *Heteropneustes fossilis* (50-60g) approximately of one year old were purchased from local fish markets in prespawning (June) phase of the annual reproductive cycle⁽⁹⁾. The fish were acclimatized

in flow-through aquarium tanks under normal photoperiod and ambient temperature (13L:11D, $28\pm 2^\circ\text{C}$) for 48hr before sampling. The experiments were performed in accordance with local/national guidelines for experimentation in animals.

CHEMICALS

Cadmium chloride (CdCl_2 , 98.9% purity) was purchased from E-Merck, Mumbai, India. Estradiol-17 β (E_2) and testosterone (T) ELISA kits (Diametra, Italy) were purchased from local suppliers. Diethyl ether and other chemicals were of analytical/HPLC grade and purchased from E-Merck, Mumbai, India.

Preparation of incubation medium

The incubation medium was prepared as described by Goswami and Sundararaj⁽¹⁰⁾ with minor modifications as described by Mishra and Joy⁽¹¹⁾.

Incubation of ovarian pieces with different concentrations of Cd

The experiments were conducted in the prespawning (June) phase. The ovary pieces containing post-vitellogenic follicles were incubated with different concentrations of CdCl_2 (0, 1ng, 0.1 μg , 1mg, 3 μg and 10 μg /ml) at 22°C for 12 or 24hr in triplicate. The medium was changed after every 4hr to maintain the pH (checked in parallel incubations in medium containing a pinch of phenol red) and collected group-wise. After completion of the incubation, the medium was collected and processed for steroid extraction. Control groups (plain medium) were set up in parallel.

Steroid extraction and Assay

The tissues were homogenized with an ultrasonic homogenizer (XI-2000 Microson, Misonics, USA) at 0°C for 5-10sec, steroid extraction and estimation of estradiol-17 β and testosterone was performed by ELISA⁽¹²⁾.

Progestin and Corticosteroid Assay

Progestins (progesterone, 17-hydroxyprogesterone, and 17,20 α dihydroxyprogesterone) and corticosteroids (cortisol, 21-deoxycortisol, corticosterone and deoxycorticosterone) were quantified by High Performance Liquid Chromatography⁽¹¹⁾.

Statistical analysis

The data were expressed as means \pm SEM ($n=5$) and analyzed by one way analysis of variance (ANOVA), followed by Tukey's test ($P<0.05$).

RESULTS

In vitro effects of different concentrations of Cd on E_2 and T

The incubation of ovarian pieces showed an overall significant effect on E_2 and T levels at 12 and 24hr (Fig. 1A, B). At 12hr, E_2 was stimulated in all the groups except the 1ng group and at 24hr, the steroid level was increased in all the groups except the 0.1 μg group ($P<0.05$, Tukey's test). Cd produced biphasic effects on testosterone level in a dose and duration dependent manner. At 12hr incubation, the steroid level was stimulated only in the 1ng group and was inhibited in the higher dose groups except the 0.1mg groups. At 24hr testosterone level was stimulated in the 1ng, 0.1mg and 1mg groups but the magnitude of the stimulation decreased with the increase in the concentrations. The 3 and 10 μg concentrations inhibited the steroid level.

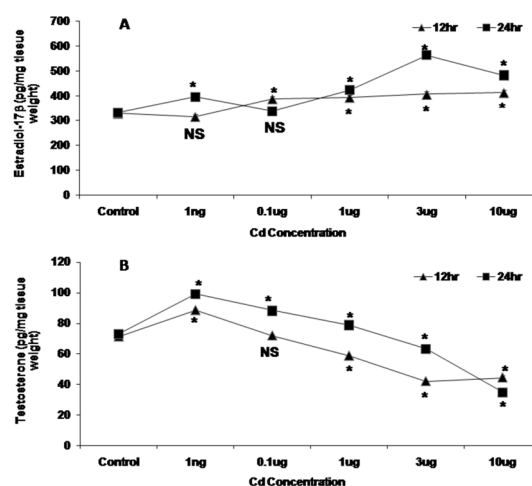


Fig. 1

Fig. 1. Effects of incubation of postvitellogenic follicles with cadmium chloride for 12 or 24hr on Estradiol-17 β (E_2 : A) and Testosterone (T: B) secretion in catfish *Heteropneustes fossilis*. Data were expressed as Mean \pm SEM ($n=5$). Data were analysed by one way ANOVA, followed by Tukey's test ($P<0.05$). Asterisks show significant difference from the control groups.

In vitro effects of different concentrations of Cd on progestins

The incubation of ovarian pieces produced overall significant changes on progestin (progesterone, 17-hydroxyprogesterone, and 17,20 α -

dihydroxyprogesterone) levels at both 12 and 24hr (Fig. 2A, B, C). The progesterone level was stimulated in the 1ng concentration (at 12hr incubation only) and in all other concentrations and incubations, the steroid level was inhibited in a dose and time dependent manner ($P < 0.05$, Tukey's test). At 12hr incubation, the 17-OHP level was stimulated in both 1ng and 0.1µg concentration groups. In all other concentration groups, the steroid level was inhibited. The inhibition was stronger at 24hr. 17,20â-DP level was stimulated significantly at all concentrations at 12hr in a biphasic manner, the response being maximal in the 1µg group. At 24hr, the steroid level was inhibited in a dose-dependent manner.

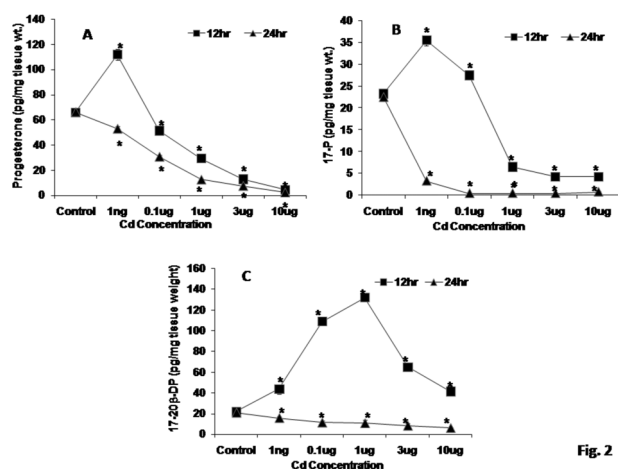


Fig. 2. Effects of incubation of postvitellogenic follicles with cadmium chloride for 12 or 24hr on progesterone (P; A), 17-OH-progesterone (17-P; B) and 17, 20β-DP (C) secretion in catfish *Heteropneustes fossilis*. Data were expressed as Mean±SEM (n=5). Data were analysed by one way ANOVA, followed by Tukey's test ($P < 0.05$). Asterisks show significant difference from the control groups.

In vitro effects of different concentrations of Cd on corticosteroids

The incubation of ovarian pieces produced overall significant changes on corticosteroid (cortisol, corticosterone, deoxycorticosterone and 21-deoxycortisol) levels at both 12 and 24hr (Fig. 3A, B, C, D). Cortisol showed biphasic changes with 1ng, 0.1µg and 1µg groups stimulating and 3 and 10µg groups decreasing the levels at both 12 and 24hr. The stimulatory response was higher at 12hr and the inhibitory response at 24hr. The Cd exposure inhibited corticosterone levels significantly at both 12 and 24hr in a dose-dependent manner. Deoxycorticosterone elicited a biphasic response, stimulatory in 1ng and 0.1µg (24hr) groups and inhibitory at higher concentrations. 21-deoxycortisol also elicited a biphasic

effect; 1ng, 0.1µg and 1µg concentrations stimulated (except 1ng at 24hr), and 3µg and 10µg inhibited the steroid level. The stimulatory /inhibitory trend was higher at the 24hr exposure.

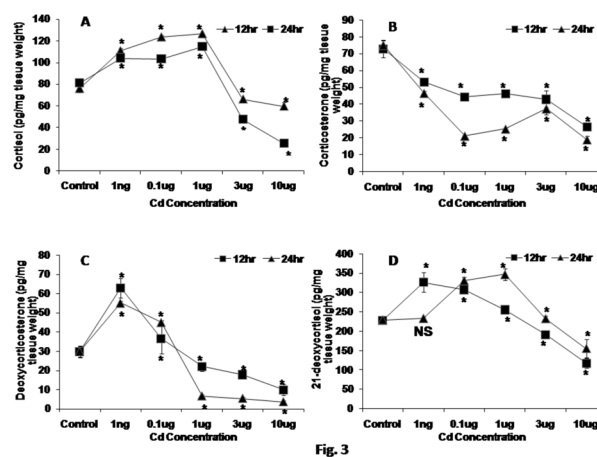


Fig. 3. Effects of incubation of postvitellogenic follicles with cadmium chloride for 12 or 24hr on cortisol (A), corticosterone (B), deoxycorticosterone (C) and 21-deoxycortisol (D) secretion in catfish *Heteropneustes fossilis*. Data were expressed as Mean±SEM (n=5). Data were analysed by one way ANOVA, followed by Tukey's test ($P < 0.05$). Asterisks show significant difference from the control groups.

DISCUSSION AND CONCLUSION

It is widely recognized that Cd is a major EDC and affect various aspects of reproduction in animals. Gonadal steroid hormones are the terminal or subterminal regulators of gametogenesis, maturation and spawning. Sequential and balanced hormone secretion is essential for maintenance of these functions. The present *invitro* study shows that Cd exposure interrupted follicular steroidogenesis at multiple sites. In teleosts, E_2 is the major regulator of vitellogenesis, a complex and elaborate process responsible for the growth of the follicle and the yolk so deposited are used during early embryonic development. The data show that Cd stimulated E_2 production in a concentration and time dependent manner. This is in agreement with the report that Cd stimulated both plasma concentration and *invitro* secretion of E_2 and vitellogenesis in the Atlantic croaker^(13,14).

Cd appears to interfere with the steroidogenic patterns at multiple sites⁽¹⁴⁾. Cd produced biphasic effect on testicular steroidogenesis in rainbow trout at short term (2hr) exposure, it stimulated 11-KT production but at 18hr incubation, it was inhibited by CdCl₂⁽¹⁵⁾. 20â-HSD activity which catalyzes the conversion of 17-P to 17,20â-DP was inhibited when

sexually immature juvenile african catfish were fed diet containing Cd⁽¹⁶⁾. Cd is a non-specific blocker of Ca⁺⁺ channels. As Ca⁺⁺-calmodulin is important for follicular steroidogenesis, the binding of Cd and Pb to the Ca⁺⁺ binding sites in calmodulin can affect hormone secretion^(17,18). Cd may inhibit the activity of many steroidogenic enzymes and ovarian maturation in common carp⁽⁷⁾. In frog, Cd was found to inhibit pituitary homogenate-induced oocyte maturation and ovulation⁽¹⁹⁾.

The actions of Cd on steroid biosynthesis may be complex, with multiple stimulatory/inhibitory actions such as those on plasma membrane, adenylyl cyclase or endogenous mitochondrial cholesterol utilization through effects on calcium ion interactions, membrane proteins (e.g. P450_{scc}) or lipids⁽²⁰⁾. Cd could mimic the effects of E₂ in estrogen responsive breast cancer cell lines⁽²¹⁾. Thus, the estrogenic actions of Cd, such as on vitellogenesis may be due to E₂ receptor activation. The present data show that Cd exposure disrupted the progesterone pathway. P₄ and 17-P were significantly inhibited except in the 12hr exposure of 1ng (P₄) and 1 and 0.1µg (17-P) groups. The higher concentrations had a deleterious effect especially in the 24hr exposure groups. In contrast, the response on 17,20â-DP was quite different and biphasic. At short exposure time (12hr), Cd stimulated the steroid production response; the response was maximal at the 1µg concentration and declined thereafter. However, at 24hr, the metal elicited an inhibitory effect in a concentration-dependent manner. The mechanisms underlying varied effects of Cd on P₄, 17-P and 17, 20â-DP is not clear at present and the enzyme involved in the conversion may be important targets of the metal.

In our earlier study with lead exposure, a similar pattern was noticed⁽¹²⁾, suggesting that metals may act similarly at various steroidogenic steps. The biphasic action of Cd on the MIS may interfere with oocyte final maturation. In Prussian carp, Cd at lower concentrations (20, 100 and 200µM) stimulated spontaneous oocyte maturation similar to carp pituitary extract or 17, 20â-DP stimulation⁽²²⁾. The spontaneous stimulation might be due to the activation of the progestin or corticosteroid pathway or both. Ca²⁺ is an activator of LH-stimulated 20â-HSD activity responsible for 17,20â-DP production⁽²³⁾.

The present data show that the catfish ovarian follicles are a major source of corticosteroids, in addition to the interrenal tissue, the adrenocortical homologue has been reported earlier⁽¹¹⁾. The Cd

exposure led to biphasic effects on cortisol, deoxycorticosterone (DOC) and 21-deoxycortisol levels. The lower concentrations stimulated the steroids with greater response at short exposure (12hr) for cortisol (1ng, 0.1µg and 1µg groups) and DOC and 21-deoxycortisol (1ng groups). At higher concentrations (3 and 10µg), both were inhibited by Cd at 12 and 24hr. In contrast, exposure to lead produced a biphasic effect on follicular cortisol and inhibitory effect on other corticosteroids⁽¹²⁾.

Although the brain-pituitary-adrenal (BPA) axis was not examined for Cd toxicity, the results imply that the BPA axis may also be affected by the metal. Lacroix and Hontela⁽²⁴⁾ reported that Cd interfered with the signalling pathway of cortisol synthesis at a step prior to the formation of pregnenolone and vulnerability of the interrenal tissue varied with species. Cortisol is the main stress hormone having both glucocorticoid and mineralocorticoid actions. The stimulatory response may be due to stress. The inhibitory response may be due to the impairment of the steroid secretion. The adverse effect of Cd on follicular corticosteroids may influence follicular functions. In teleosts, cortisol or DOC are implicated in oocyte final maturation. The stimulatory effect of low Cd may be beneficial for maturational activity⁽²⁵⁾. The results of our investigations indicate that cadmium adversely affects severely steroid hormone secretion thereby affecting all hormone induced activity of the ovary.

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Conflict of Interest

There is no interest of conflict among authors.

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A Study to Measure effect of Amplification Strategies on Tinnitus

Indranil Chatterjee¹, Nilanjan Paul¹, Somsubhra Chatterjee², Snehasis Barman³, Pankaj Sarkar⁴

¹Lecturer, Ali Yavar Jang National Institute of Hearing Handicapped, Bonhooghly, Kolkata, ²Residential Medical Officer Cum Clinical Tutor, N.R.S Medical College & Hospital, Kolkata, ³D.L.O, Consultant E.N.T Surgeon. Kamala Roy Hospital, Uttarpara, ⁴Consultant Audiologist, Uttarpara speech & Hearing Centre, West Bengal

ABSTRACT

Tinnitus is a symptom which is highly distressing for many of its sufferers and was poorly understood until recently. The Neurophysiological model provides a logical explanation as to its pathophysiology and treatment rationale. It postulates that amplification devices may effectively decrease tinnitus severity and associated psychological distress, provided that certain recommendations be followed, which is in accordance to the neurophysiological model of tinnitus mechanism. The present study attempted to clinically test these hypotheses in 70 subjects with hearing loss of varying degree and severe tinnitus with considerable anxiety and sleep disturbances. All the patients demonstrated uniform and significant improvement in tinnitus severity (measured by tinnitus severity quotient), anxiety (measured by state-trait anxiety inventory) and insomnia (measured through sleep diary), but with no differences between single and multichannel fittings which demonstrates the clinical efficacy of the neurophysiological model and strongly validates the use of binaural fitting of hearing aids for reduction of tinnitus in patients with concomitant hearing loss.

Keywords: Tinnitus, Amplification Strategy, Psychological Distress

INTRODUCTION

Tinnitus has been recognized for thousands of years and this intrusive symptom is terrifying for many of its sufferers, causing considerable negative implications on the perceived quality of life and a great amount of psychological distress.

Tinnitus has been traditionally defined by the American National Standards Institute¹ as “the sensation of sound without external stimulation.” Several such traditional definitions had been proposed. But, as Jastreboff and Hazell (2004) points out, “traditional definitions of tinnitus as any sound generated within the head, without regard for the underlying mechanism(s) or possible origin, invites discussion of phenomena unrelated to tinnitus problems and promotes categorization of tinnitus by

symptoms alone.”² Based on several psycho-acoustical and neurological lines of evidence, and the similarity with pathophysiological process of other phantom sensations, Jastreboff described tinnitus as a phantom auditory perception and defined it as “the perception of sound that results exclusively from activity within the nervous system without any corresponding mechanical, vibratory activity within the cochlea, and not related to external stimulation of any kind.”² This view has received considerable support by researchers and contemporary studies point out that tinnitus has heterogenic pathophysiological initiation at different levels of lemniscal and extralemniscal auditory pathways all of which leads to a common end result: neural reorganization at the central levels thus generating tinnitus.³

Furthermore, the widely accepted neurophysiological model of tinnitus suggests the strong involvement of the limbic and autonomic nervous system in causing psychologically distressing tinnitus, thereby affecting patients’ quality of life, including physical, emotional and social functioning, and induces psychological distress, such as anxiety and depression⁴. The term ‘psychological distress’

Corresponding author:

Somsubhra Chatterjee

145 Raja Peary Mohan Road, Uttarpara

Dist. Hooghly, West Bengal-712258

Ph.: 9836145175

E mail: somsubhra.chatterjee@gmail.com

describes the individualized, subjective response of acute or chronically ill patients⁵, manifested by an alteration from a stable baseline emotional state to one of anxiety, depression, lack of motivation, irritability, aggressiveness, self-deprecation, and even suicide⁶. Anxiety and depression are important indicators of psychological distress, and greatly reduces health related quality of life measures, thereby creating a vicious circle between quality of life and psychological distress. Measuring psychological distress in study populations of subjects with a (chronic) disease is usually performed by means of measures of anxiety and depression - such as the Hospital Anxiety and Depression Scale⁷, State-Trait Anxiety Index⁸, Anxiety Sensitivity Index⁹ and Beck Depression Inventory¹⁰. Significantly perceived handicap and psychological distress have been described in about 40-50% of tinnitus sufferers¹¹. This is related to a variety of tinnitus-related complaints: anxiety, depression, insomnia, concentration problems, irritability, anger, frustration, inability to relax, feelings of helplessness, avoidance of noisy or quiet situations, withdrawal from social events, and emotional problems in relationships with family, friends and colleagues¹², development of psychosomatic symptoms in tinnitus sufferers involves the process of selective perception, association of tinnitus with negative emotional reinforcers with development of conditioned reflexes, a constant state of alertness and development of a vicious cycle involving both the conscious and subconscious levels.

Sleep disturbances and insomnia is perhaps the most common psychosomatic symptom in tinnitus patients. According to population studies, approximately 50% of tinnitus patients have disturbed sleep¹³. The auditory-limbic system connectivity is highly active at subconscious levels during sleep, and thus problem tinnitus results in stimulation of the sympathetic part of the autonomic nervous system and keeps high levels of activation during both day and night. Sleep deprivation affects concentration and attention; it creates mood swings and irritability. The course, type and features of sleep disturbances in a patient are generally enumerated by maintaining "sleep diary".

Many treatment protocols have been proposed for tinnitus management. Most patients can not be helped by medical or surgical treatment, and, therefore seek other forms of professional intervention. Different approaches include: a) psychological management (relaxation technique, cognitive therapy, attention

control and imagery training) b) biofeedback training, c) cognitive-behavior modification, d) tinnitus masking, e) tinnitus habituation therapy (THT). However, the Tinnitus Retraining Therapy (TRT), given by Jastreboff & Jastreboff, is presently the most accepted and theoretically sound tinnitus management protocol, with the basic principle of achieving habituation of tinnitus signal. "Sound therapy" is an integral part of TRT, and according to Jastreboff and Hazell, it facilitates tinnitus habituation by decreasing the strength of the tinnitus signal. Enriching the sound environment effectively reduces the contrast between the environment and tinnitus signal, leading to effective decrease of the strength of the tinnitus signal and reduce activation of the limbic and autonomic nervous systems. However, three factors that are posited by Jastreboff and Hazell of utmost importance are:

- The level or type of external sound should not induce any negative reactions
- The characteristics of tinnitus perception need to be preserved
- Sounds should not attract attention, interfere with communication or affect everyday activities.

Use of wearable sound generators with controls to achieve the above factors is highly recommended in literature. In hearing impaired persons, sound enrichment is achieved, and further enhanced by the hearing aids, and the approach is similar to that of normal hearing. Jastreboff and Hazell (2004) postulated the following factors to be necessary for effective sound therapy: 1) the sound level should be below partial suppression level, i.e. "mixing point", 2) fitting should be bilateral to avoid asymmetrical stimulation of the auditory system. 3) use of as open as possible ear-mold fittings to minimize the occlusion effect and the reduction of normal access for environmental sounds.²

OBJECTIVES OF THE STUDY

The objectives of the study are to-

- 1) To find out the difference in tinnitus severity, sleep efficiency and state anxiety; pre and post amplification so as to demonstrate improvement in tinnitus induced symptoms by sound enrichment as per the neuropsychological model.
- 2) To determine the differences in tinnitus severity with different amplification strategies in users of

single channelled programmable digital aids and multi channelled programmable digital aids.

METHODOLOGY

Subjects

Seventy clients (mean age 45.7 years) with a complaint of tinnitus secondary to hearing loss were included in the study. All the subjects had sensorineural hearing loss, bilateral "A" type tympanogram with absent acoustic reflexes. Subsequent to audiological and tinnitus assessments, clients were fitted with hearing aids; 52 of them were fitted with single channelled and 18 of them with multichannelled digital behind the ear hearing aids.

MATERIALS

- 1) Tinnitus Severity Quotient (TSQ): a 12-item questionnaire designed to assess the effects of tinnitus on individuals was administered face to face and the score recorded
- 2) Sleep efficiency: calculated to objectify the sleep disturbance (insomnia) if any as the total time asleep expressed as a percentage of total time spent in bed. For this the clients are asked to maintain a sleep diary one week prior to use of hearing aid and one week following fitting of the hearing aid.
- 3) Spielberger State- Trait Anxiety Inventory: A Bengali version of the Questionnaire by N. B. Mallick and P. K. Chattopadhyay was used for the purpose.

PROCEDURE

The study was approved by local ethical committee of AYJNIHH, Bonhooghly and all the patients gave written consent before tests were performed on them.

- a) The following audiological assessments were done on the 70 subjects: pure-tone audiometry, impedance audiometry, otoacoustic emission and auditory brainstem response; Most Comfortable Loudness (MCL) and Loudness Discomfort Level (LDL), and tinnitus assessment including pitch and loudness matching, Minimum Suppression Level (MSL) and "mixing / blending point" was done.

- b) Post assessment, clients were fitted with single and multi-channelled programmable digital BTEs as per their audiological requirements. Of the 70 clients, 30 were fitted GN Re Sound V 70 single channelled programmable digital BTE, 22 with GN Re Sound V 80 single channelled programmable digital BTE and another 18 with GN Re Sound multi channelled DSP BTE. All the clients were fitted in their better ear.
- c) All the clients were made to fill the TSQ, maintain a sleep diary and undergo anxiety assessment, both pre and 1 month post amplification.

RESULTS

Overall mean pure tone thresholds at different frequencies for the 70 clients are tabulated below.

Table 1 : Arithmetic mean and standard deviation for the pure tone thresholds

Frequency	right ear (thresholds)	Left ear (thresholds)
250 Hz	57±22.64	42±23.02
500 Hz	68±21.34	52±20.22
1 KHz	55±21.90	34±19.06
2KHz	56±25.67	63±20.66
4KHz	71±19.66	76±20.72
8KHz	68±20.46	73±17.65

Table 2: Pre and Post amplification (mean scores with standard deviation) on TSQ, Sleep efficiency and STAI

Test Tools	Pre Amplification scores	Post Amplification Scores
TSQ	46±6.2	22±7.8
Sleep Efficiency	66.82±7.2	87.78±5.6
State anxiety on STAI	62±4.62	59.72±2.33

The data were subjected to descriptive statistics and paired t-test at 5% level ($P=0.003<0.05$). On t-test, for each assessment tool, post amplification score showed significant improvement as compared to pre-amplification score.

Further analysis was done taking both the groups into consideration viz. single channelled and multi channelled programmable digital BTE H/A users and the improvement in scores on TSQ and STAI.

Table 3: Pre amplification and Post amplification scores on TSQ and STAI in single channeled and Multi channeled programmable digital hearing aid users.

Test Tools	Single Channeled users		Multi Channeled users	
	Pre amplification scores	Post amplification scores	Pre amplification scores	Post amplification scores
TSQ	48±6.4	22±7.8	40±6.3	20±5.8
STAI	60±8.6	58.6±3.2	62.2±7.6	59.6±6.1

On t- test, significance in scores were noted between the two groups either on TSQ($P=.001<0.05$) or on STAI (concluding that though an overall improvement in scores of tinnitus is noticed after amplification in all users but no significant difference in improvement is noticeable in the different user groups)[$P=.002<0.05$].

However, a significantly important outcome was the shift of tinnitus ear in 4 subjects.

DISCUSSION

The use of hearing aids can effectively habituate tinnitus. When hearing aids do succeed in eliminating or reducing tinnitus it is probably due to the fact that hearing aids restore the wearer's ability to hear background noise, thereby increasing environmental sound and decreasing the perceived tinnitus signal strength.

In this study, significant differences in scores on TSQ and STAI were noticed on pre and post amplification assessments. Similar studies have been reported by Zaugg & Fausti, 2002¹⁴. The beneficial effects of early hearing aids in tinnitus patients were first reported by Saltzman and Ersner in 1947. This has been supported by other reports over the years^{15,16}. There are different philosophies concerning the use of amplification for tinnitus patients; thus, there is no clear agreement as to when a patient would benefit from amplification. Some clinics have reported that only 20 to 30% of their patients are fitted with amplification¹⁷. The fact that all tinnitus patients would be relieved of tinnitus with the use of hearing aids has been contradicted by findings of the Oregon Tinnitus Clinic where 7% of the 192 clients considered could only benefit from the hearing aid while 53% required some other tinnitus maskers and 40% proved to be unmaskable. The low success rate when attempting to mask tinnitus using hearing aids probably reflects the fact that majority of patients have high pitched tinnitus. When benefit is present, it may be due to reduced stress associated with hearing loss, which

often accompanies tinnitus, and/or result from amplification of ambient sounds that tend to mask the tinnitus or make it less noticeable. However, the neurophysiological model provides the most plausible explanation and rationale for amplification in tinnitus patients. In fact the model postulates significant and uniform improvement in perceived tinnitus severity by use of amplification. The present study results strongly support this. The simultaneous decrease in tinnitus induced psychological distress in the subjects clearly demonstrates strong habituation effects and weakening of auditory-limbic system connections. Perhaps these changes became so evident due to following of Jastreboff's recommendations.

Further, the finding that improvement in tinnitus severity does not differ in single v/s multichannel fitting directly proves Jastreboff's view that tinnitus is a central, and not a peripheral phenomenon and thus pitch and quality characteristics of external sound has no bearing on perceived tinnitus severity.

Moreover, Jastreboff has postulated that attempts to stimulate only one side in unilateral tinnitus frequently results in a shift of the perceived location of the tinnitus to the opposite side because of the strong interaction within the auditory pathways, and the asymmetry of sound stimulation. This is demonstrated in the present study where 4 subjects had shifting of their tinnitus ear. This warrants the use of bilateral fitting as much as practicable regardless of unilateral or bilateral tinnitus.

CONCLUSION

Hearing aids facilitate habituation to the symptom- 'tinnitus' in these users besides improving hearing and communication. Increased exposure to external sounds over time indirectly through hearing aids could contribute to reorganization of neural pathways responsible for tinnitus generation and perception. Altering the pattern of activity within the central auditory system might result in permanent reduction in tinnitus pattern.

Further the results urges to investigate the benefits of single and multiple channeled programmable digital hearing aids in a single client when fitted consecutively, and to further reason out the neuro-mechanism behind hearing aids serving as tinnitus maskers. Multi-memory aids permit dedicating one program for normal listening purposes and another program for effective masking of tinnitus.

Further, hearing health specialist do not normally receive training in the management, methods of training etc. all professionals who are at the contact for tinnitus patients should be aware that tinnitus is preventable and treatable probable helping patients to gain a sense of control may thus be a key component of successful therapy.

Conflict of interest: Nil

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A Study on Prevalence of Needle Stick Injuries among Junior Doctors and Nursing Students in Kims, Hubli

Geeta V Bathija¹, Datatreya D Bant², S R Itagimath³

¹Associate Professor, ²Professor, ³Asst. Professor/Statistician, Department of Community Medicine, Karnataka Institute of Medical Science, Hubli, Karnataka

ABSTRACT

Background: Junior doctors and nursing students as well as health care workers belong to high risk group for blood-borne infections including HBV, HCV and HIV. The risk of occupational exposure is caused by lack of experience and professional skill in invasive procedures performed during clinical education.

Objectives:

- 1) to determine the prevalence of needle stick injury among junior doctors and nursing students.
- 2) to assess the causes, work place and mode of the needle stick injury.
- 3) to check the awareness about NSI among health workers.

Materials and methodology: A cross sectional study conducted among the junior doctors and nursing students by a pre tested questionnaire.

Results: Out of the 200 study sample, 125(62.5%) got needle stick injury. Junior doctors are four times more affected than nurses. Most of the NSI among junior doctors(32) occurred in the casualty and for nursing students(18) in medicine wards. Maximum NSI occurred during suturing(40%) followed by recapping(29.6%), injections(26.4%), blood withdrawal(24.8%) and cannula insertion(9.6%). 56.3% had no awareness about needle safety devices.

Conclusion: In this study population, junior doctors are at higher risk than the nursing students. Majority of them are not aware of needle safety devices and proper method of recapping the needles, so regular courses, seminar and management trainings should be conducted. Reporting of needle stick injuries should be mandatory to higher official.

Keywords: NSI(Needle Stick Injury), Junior Doctors, Nursing Students

INTRODUCTION

Injections are skin piercing procedure performed with a syringe and needle to introduce a substance into the body for prophylactic, diagnostic and curative purposes.¹ The WHO defines "a safe injection" as the one that does not harm the recipient, does not expose the provider to any avoidable risk, and does not result

in any waste that is dangerous to the community.² Needle stick injury is a non-intentional puncture of skin caused by an injection needle¹. Needle stick injury is a cardinal indication of poor injection safety practices by health workers.¹ Because of the environment in which they work, needle stick injuries present the single greatest occupational hazard to medical personnel.

While as many as 20 blood borne pathogens can be transmitted through accidental needle stick injuries, the potentially life threatening ones are human immunodeficiency virus, hepatitis B and hepatitis C virus.³

Corresponding author:

Geeta V Bathija

Associate Professor,

Department of Community Medicine,

Karnataka Institute of Medical Science, Hubli

Email: bathija.geeta@yahoo.in

The average risk of transmission of HIV to health care worker after percutaneous exposure of HIV infected blood has been estimated as 3-4 in 1000, while the chance of contracting HBV after an accidental injury with HBV infected needle is on an average 1 in 20³. The chances of contracting HCV after an accidental HCV contaminated accidental needle stick injury averages 3.5 in 100⁴. According to WHO study, the annual estimated proportions of health care workers (HCW) exposed to blood borne pathogens globally were 2.6% for HCV, 5.9% for HBV, and 0.5% for HIV, corresponding to about 16,000 HCV infections and 66,000 HBV infections in HCW worldwide⁵. Although HBV exposure poses the highest risk for infection, it has an effective vaccine and post exposure prophylaxis for HBW which can dramatically reduce the risk. This is not so for HIV and HCV. Therefore prevention is the only respite for these.

Because needle stick injuries are often under reported, health care institutions should not interpret low reporting rate as low injury rate. Injuries recorded through standard occupational reporting systems may underestimate the true injury rate, by as much as 10 fold⁶. about 39.4% NSIs are under reported. needle stick injuries have an indirect significant consequences in health care delivery especially so in hospitals like KIMS, where already qualified work force is limited with respect to the disease burden in the population. These injuries not only potentiate health consequences but also cause emotional distress in health care workers which results in missed workdays and directly affects the health care services and resources.

With all the technological advancements, there is a need to heighten the focus on safety for the health care workers. There is a high occurrence of needle stick injuries in HCWs with a high rate of ignorance and apathy. These issues need to be addressed, through appropriate education and other interventional strategies by the hospital and infection control community. Hence an effort was made to study the prevalence of needle stick injuries among the junior doctors, // interns and nursing students of KIMS Hubli , and to study causes and mode of needle stick injuries and their awareness about NSI.

AIMS AND OBJECTIVES

- 1) To study prevalence of needle stick injury among juniors doctors and nursing students
- 2) To study the causes, work place and mode of the needle stick injury.
- 3) To check the awareness about NSI among health workers

MATERIALS AND METHOD

The study was conducted in KIMS hospital, HUBLI, for a duration of 1month from July 5th 2012 – Aug. 5th 2012. The data was collected by a well-structured pretested questionnaire. It was conducted on 100 postgraduates, 100 interns and 200 nursing students. Out of the above mentioned health care workers, 87 postgraduates, 55 interns, 58 nursing students returned the data. A higher coverage could not be attained among the nursing students due to their absence because of annual examination study leave.

The method was a cross sectional study conducted among the junior doctors and nursing students by a questionnaire method. The questions focused on the number of students who had a NSI, cause of the NSI, factors affecting it. The questionnaire also focused on safety measures adopted by them, precautions and measures taken after the injury. ..

The data was collected, by distributing the questionnaires and the data collected was further tabulated, analyzed, graphs and charts were obtained then concluded with the result. SPSS version 20.0 was the software used for obtaining statistical data and graphs.

RESULTS

Most of the junior doctors and nursing students belonged to the age group of 18 to 24 years (56%)

Table 1: Prevalence of NSI among junior doctors and student nurses.

NSI	PRESENT	ABSENT	TOTAL
Doctor	99 (69.72%)	43(30.28%)	142(100%)
Nurse	26(44.83%)	32(55.17%)	58(100%)
Total	125	75	200

Chi-square=22.97, P<0.0001, Highly significant

Doctors are four times more affected than nurse

Table 2: Showing the work place, Mode and cause of the needle stick injury (n=125)

Work place	NSI+	NSI-	Z test	P	Remarks
Medicine ward	41(32.8%)	84(67.2%)	7.8	P<0.0001	HS
Labour room	18(14.4%)	107(85.6%)	4.59	P<0.001	HS
Surgery	16(12.8%)	109(87.2%)	4.28	P<0.001	HS
Operation theatre	20(16%)	105(84%)	4.88	P<0.001	HS
Causality	36(28.8%)	89(71.2%)	7.13	P<0.0001	HS
Intensive care unit	7(5.6%)	118(94.4%)	2.72	P<0.01	S
Pathology	4(3.2%)	121(96.8%)	2.03	P<0.05	S
Pediatric ward	1(0.8%)	124(99.2%)	1	P>0.05	NS
Cause of NSI	NSI+	NSI-	Z test	P	Remarks
Long working hour	62(49.6%)	63(51.4%)	10.97	P<0.0001	HS
Stress	52(41.6%)	73(58.4%)	9.43	P<0.0001	HS
Lack of assistance	41(32.8%)	84(67.2%)	7.81	P<0.0001	HS
Negligence of protocol	41(32.8%)	84(67.2%)	7.81	P<0.0001	HS
Mode of needle stick injury	NSI+	NSI-	Z test	P	Remarks
Injection	33(26.4%)	92(73.6%)	6.7	P<0.001	HS
Blood/CSF withdrawal	31(24.8%)	94(75.2%)	6.42	P<0.001	HS
Suturing	50(40%)	75(60%)	9.13	P<0.0001	HS
Cannula insertion	12(9.6%)	113(90.4%)	3.65	P<0.01	HS
Recapping	37(29.6%)	88(70.4%)	7.25	P<0.0001	HS

NS-Not significant, S-Significant, HS- Highly significant.

Table 3: The preventive measures used against needle stick injuries (n=200)

Preventive measure used	No. of personnel using preventive measure	Percentage of personnel using preventive measure
Double gloves	56	28%
Blunt suture needles	14	7%
Auto-disposable syringes	54	27%
Wide cap syringes	22	11%
Hepatitis B vaccinated	184	92%

28% of the students used double gloves followed by auto disposable syringes 27%, the wide cap syringes 11% and blunt suture needle 7%.

Table 4: Knowledge about immediate responses of personnel after NSI (n=200)

Immediate response taken	No. of personnel taking the response	Percentage of personnel taking the response
No immediate response	72	36%
Washed with soap	53	26.5%
Washed with spirit/alcohol	91	45.5%
Sodium hypochlorite	5	2.5%
Apply Band-Aid	35	17.5%
Put pressure to stop bleeding	11	5.5%
Post exposure prophylaxis	6	3%
Tetanus toxoid requirement	37	18.5%

Most of the students washed site of NSI with spirit & alcohol

DISCUSSION:

In our study out of 200 sample, 125(62.5%) got needle stick injury while 75(37.5%) did not get NSI. In a study conducted in Pakistan out of 220 samples, 94% got NSI⁷ and in Delhi out of 332 samples 79.5% had NSI. 56% of the students belonged to the age group of 18 to 24 years age group. 90% were single only 10% were married. 79.2% of the junior doctors were victims of NSI. 38.4% got injury once and 25.6% got injury twice or more than twice during their working experience. Most of the students had NSI during the first 12 months of their work.

Maximum injury occurred in medicine ward 32.8%, followed by causality 28.8%, OT 16%, labour room 14.4%, surgery 12.8%, intensive care unit 5.6%, pathology department 3.2%. During needle stick injury 38% of the patients status regarding HBV, HIV, HCV was unknown. In a study conducted at a tertiary hospital in Pakistan majority of NSI occurred in surgery dept and casualty¹². In a study at Malaysia 52% in medicine ward. At Iran tertiary hospital 47% in surgery 35% in labour room¹⁰.

49.6% of the students suffered NSI due to long working hours followed by stress, lack of assistance, negligence of protocol. The needle stick injuries occurred mostly during suturing followed by recapping injection blood, CSF withdrawal, cannula insertion. Nearly 2/3rd of the subjects reported bleeding from the site of NSI. Both the sexes had equal prevalence. Junior doctors were more affected than nurses (28%). In Ahmedabad study Gujarat 39% doctors and 27% nurses had NSI¹³.

In the present study, 28% used double gloves followed by auto disposable syringes (27%), wide cap syringes (11%) and blunt suture needle (7%). In Malaysian study out of 136 samples, 65% wore gloves during procedures. 45.5% washed NSI site with spirit and alcohol¹¹. In Delhi study out of 322 samples 61% washed hands with soap. In Pakistan study the 92% washed NSI site with spirit 67% with soap, 75% put band-aid¹⁵. In the present study only 2.5% of the subjects used sodium hypochlorite.

92% of the students were vaccinated against hepatitis B. 56.3% did not know needle safety device. 29.1% recapped needles in the wrong way.

CONCLUSIONS

From the study it was concluded that 62.5% got needle stick injury. Most of the students had NSI during first 12 months of their work. 23.5% of the injuries occurred in medicine ward. NSI occurred commonly during suturing followed by recapping, injection, blood, CSF withdrawal, cannula insertion. 67.8% recapped the needles in the wrong way. Nearly 2/3 of them reported bleeding from NSI site. 38% of patients status was unknown for HIV, HBV, HCV during NSI.

RECOMMENDATIONS

It is highly recommended that the junior doctors and nursing students should be aware of their occupational health hazards through career counseling. Regular courses, seminar and management trainings should be conducted. Reporting of needle stick injuries should be mandatory to higher officials. They should encourage to use double gloves and needle cutter in their work environment. Screening of all doctors and nurses for infection transmitted through contaminated needles should be one on regular interval. It should be mandatory for all to get immunoprophylaxis against hepatitis B before entering into clinical setting. Introduction of yellowone cap for needles

Fig. 1



Yellowone needle cap: It is a non-reusable sharps container for disposal of hypodermic needles. It is designed for syringes with luer slip. The cap fits over 90% of all beverage cans.

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Study of Staging and Prognostic Significance of Bone Marrow Involvement in Malignant Lymphomas in Northern India : Clinicopathological Study

Prem K Garg¹, A Deshmukh², Geeta Deshmukh³

¹Associate Professor, Department of Pathology, Mayo Institute of Medical Sciences, Gadia, Barabanki, Lucknow, Uttar Pradesh, India, ²Associate Professor of Cardiology, ³Professor of Pathology, School of Medical Science & Research, Sharda Hospital, Greater Noida, U.P India

ABSTRACT

Introduction: Bone marrow is not only a reservoir of stem cells but also provides microenvironment for proliferation and development of precursors and regulate the release of mature cells in to circulation¹⁰. Bone is commonly involved in metastatic tumors and rank third most common site of metastasis after lung and liver¹². Metastasis may be present in the bone marrow without any abnormalities recognized in bone scans, radiographic pictures, serum chemistry and hematological parameters and remain the only procedure to diagnose the presence of metastatic tumor.

AIMS: To study the clinical features & characteristics of BM involvement in NHL& HL cases with respect to morphology of infiltration for staging and their prognosis.

Materials and Method: A prospective study was conducted on 38cases who had not received any prior specific treatment (chemotherapy and radiotherapy) for both Hodgkin's and non-Hodgkin's lymphoma from northern India. . Out of 38 cases Hodgkin's lymphoma were 08 cases and non-Hodgkin's lymphoma were 30 cases . All cases were examined clinically and later on Bone marrow aspiration and Bone marrow biopsy was obtained from the posterior superior iliac spine. The biopsies were fixed in 10% buffered formalin solution and decalcified using 10% formal - formic acid for 4 - 6 h followed by routine processing. The serial sections were stained by hematoxylin and eosin and reticulin stains. The smears were air dried and immediately fixed in methanol for one of the Romanowsky stain (We used Leishman stain and May-Grunwald Geimsa stain) for cellularity and morphology¹. Serial aspiration and biopsies were done in all cases of Hodgkin's and non-Hodgkin's lymphoma

Observations: The most prominent clinical feature was cervical lymphadenopathy. Patients with advanced disease had systemic features like fever, weight loss and hepatosplenomegaly.

The incidence of marrow involvement in known case of Hodgkin's and non-Hodgkin's lymphoma was 25% and 43.33% respectively. The incidence of bone marrow involvement was found in mixed cellularity and in lymphocyte depletion type of Hodgkin Lymphoma cases and the pattern of involvement of bone marrow was diffuse in all the cases.

The extent of marrow involvement was greatest in Non Hodgkin lymphomas that exhibit a diffuse pattern of infiltration. In thirteen cases (43.33%) of bone marrow involvement, seven cases (53.8%) showed presence of neoplastic cells in both aspiration and biopsy while six cases (46.2%) showed presence of neoplastic cells in bone marrow biopsy.

Serial aspiration and biopsies revealed that both cases (100%) of Hodgkin's lymphoma improved with systemic chemotherapy, while five cases (38.46%) of non-Hodgkin's lymphoma showed clearance of bone marrow by the neoplastic cells on completion of chemotherapy.

Conclusion: In all the cases, which infiltrated to bone marrow, histological grades were same as in the FNAC / Histopathology examination at the time of diagnosis from the primary site.

Bone marrow aspiration and biopsy were performed as complimentary procedures

But Bone marrow biopsy was found superior to bone marrow aspiration.. It was also helpful in the management strategy of the disease as well as to see the response of the therapy by serial aspiration and biopsies¹⁰. It was found that in five cases (38.46%) of non-Hodgkin's lymphoma bone marrow showed clearance of tumor cells after completion of chemotherapy.

Keywords: Bone Marrow Involvement, Hodgkin's Lymphoma, Non-Hodgkin's Lymphoma

INTRODUCTION

The bone marrow examination is a valuable procedure in the staging and management of patients of malignant lymphoma. It may be used for initially assessing the extent of the disease, for measuring patient's response to chemotherapy and for following previously treated patients for evidence for recurrence of disease. Occasionally the primary diagnosis of lymphoma is made from a bone marrow examination as a part of the investigation of a patient with blood cytopenias, fever of unknown origin or a thoracic or abdominal mass. Trephine biopsy sections generally provide the most useful information in the assessment of the marrow for Hodgkin's lymphoma or non-Hodgkin's lymphoma. By performing bilateral posterior superior iliac spine bone marrow examination, specimen size is double and present two separate areas. This procedure has been shown to increase the yield of demonstrable marrow involvement in both Hodgkin's and non-Hodgkin's lymphoma. In most instances well prepared paraffin embedded marrow sections combined with aspirate smears are adequate for identifying and characterizing lymphomas as well as to determine the prognostic value of different subtypes of lymphomas.

The present study (2008 - 2012) has been aimed to report our experience to show bone marrow involvement in known cases (diagnosed on FNAC / Histopathology) of Hodgkin's lymphoma (8) and non-Hodgkin's lymphoma (30) from North India, with respect to its clinical, pathological and prognostic aspects.

MATERIAL AND METHOD

Only those patients who had not received any prior specific treatment (chemotherapy and radiotherapy) for both Hodgkin's and non-Hodgkin's lymphoma from northern India, were included in the study. A total number of 38 cases (Hodgkin's lymphoma- 08 cases and non-Hodgkin's lymphoma- 30 cases) remained to be included.

BONE MARROW CYTOLOGY

This was done from the posterior superior iliac spine using Salah's aspiration needle and withdrawing

about 0.5 ml aspirate after topical anesthesia with 2% xylocaine infiltrated locally. The films were prepared immediately by placing the aspirated material on glass slide. The smears were air dried and immediately fixed in methanol for one of the Romanowsky stain (We used Leishman stain and May-Grunwald Geimsa stain) for cellularity and morphology¹.

BONE MARROW BIOPSY

The site was same as in the bone marrow aspiration. We also compared with contralateral side biopsy. Skin puncture was same but the needle was introduced at slightly different angle in the bone.

Trephine biopsy was performed by rotating a specialized biopsy needle (usually Jamshidi type) under pressure in sterile conditions and under local anesthesia, to obtain a core extending from periosteum in to the interstices of the bone marrow cavity. The core biopsy, which on average measured 1.5 cm in length, was immediately fixed in 10% formal saline, decalcified in 5% formic acid, paraffin embedded sections were cut and stained in Hematoxylin and Eosin and Reticulin stain.

OBSERVATIONS

Clinical features:- The most prominent clinical feature is cervical lymphadenopathy. Patients with advanced disease had systemic features like fever, weight loss and hepatosplenomegaly.

Table 1. Clinical presentation in Malignant Lymphoma from known primary site at the time of bone marrow examination

Clinical presentation	Hodgkin's lymphoma (08)	Non-Hodgkin's lymphoma (30)
Duration > 6 months	03 (37.8%)	12 (40%)
Symptoms due to anemia (fatigue/malaise)	02 (25%)	10 (33.33%)
Fever	03 (37.8%)	13 (43.33%)
Bone pain	-	08 (26.66%)
Lymphadenopathy	08 (100%)	30 (100%)
Edema / Ascitis / Pl effusion	01 (12.5%)	04 (13.33%)
Bleeding tendency	-	01 (3.33%)

Incidence of marrow involvement: The incidence of marrow involvement in known case of Hodgkin's and non-Hodgkin's lymphoma was 25% and 43.33% respectively.

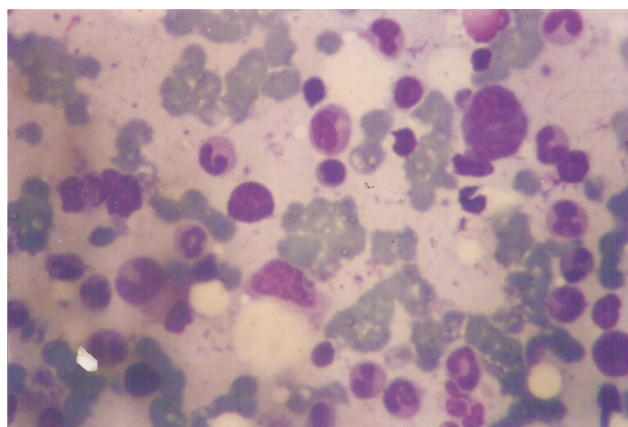


Fig. 1. Hodgkin's Lymphoma Reed - Sternberg (RS) like cell infiltrating to the bone marrow (Bone marrow aspiration - Leishman x 500)

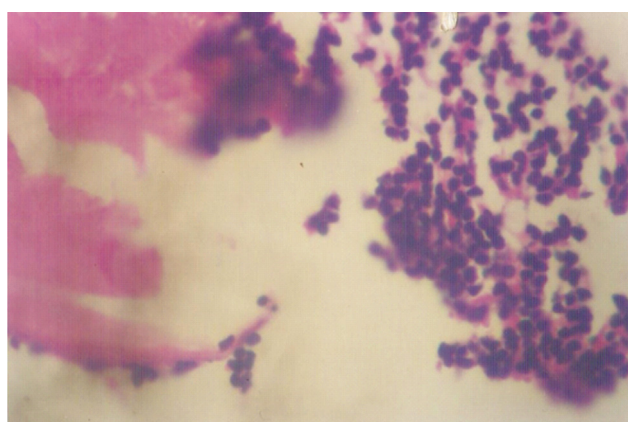


Fig. 2. Non - Hodgkin's Lymphoma Diffuse infiltration in the bone marrow by clusters of cells showing indistinct cell boundaries with increased

Pattern of involvement

Cases of Hodgkin's lymphoma with bone marrow involvement nearly always have constitutional symptoms. The diagnosis of Hodgkin's lymphoma required not only the presence of characteristic neoplastic cells but also an appropriate background since morphologically resembling Reed-Sternberg cells may be seen in other conditions. In one known case of Hodgkin's lymphoma our diagnosis was based on the presence of single Reed-Sternberg cell in the bone marrow without any appropriate background¹. The incidence of bone marrow involvement was found in mixed cellularity and in lymphocyte depletion cases and the pattern of involvement of bone marrow was diffuse in all the cases. In positive bone marrow cases one case (12.5%) showed Reed-Sternberg like cells in both aspiration and biopsy section while one (12.5%) case showed presence of neoplastic cells in trephine sections only. Mild fibrosis was associated with one case (12.5%) of Hodgkin's lymphoma at the time of bone marrow examination. Six cases (75%) showed

normocellular, while two cases (25%) showed hypocellular bone marrow. Erythroid reaction was found to be normoblastic in all the cases.

The low grade non-Hodgkin's lymphoma comprised of small lymphocytic type while the high grade lymphoma was comprised of lymphoblastic type. The extent of marrow involvement was greatest in lymphomas that exhibit a diffuse pattern of infiltration. Out of thirty cases, twenty three cases (83.33%) showed normocellular bone marrow while cellularity was low in seven (16.67%) cases. Erythroid reaction was found normoblastic in all the cases. In thirteen cases (43.33%) of bone marrow involvement, seven cases (53.8%) showed presence of neoplastic cells in both aspiration and biopsy while six cases (46.2%) showed presence of neoplastic cells in bone marrow biopsy.

Serial aspiration and biopsies were done in all cases of Hodgkin's and non-Hodgkin's lymphoma and it was found that both cases (100%) of Hodgkin's improved with systemic chemotherapy, while five cases (38.46%) of non-Hodgkin's lymphoma showed clearance of bone marrow by the neoplastic cells on completion of chemotherapy.

DISCUSSION

One of the aim of this study was to compare the results obtained by two different methods of bone marrow preparation i.e. bone marrow aspiration and biopsy. We found that bone marrow aspiration and biopsy are complimentary to each other for better diagnostic results and therapeutic response as described by James E. Bearden and Robert W. McKenna^{5,11}. We also found that the viability and utility of the Salah's and Jamshidi needles from the posterior superior iliac spine is as good as described by James F. Welsh and all other workers⁶. We have no experience of using Rosenthal and Westerman Jensen needles, which was chosen by James N. Ingle et al⁷. It was observed that bone marrow aspiration smears were positive in eight cases (21.05%) while biopsy was positive in fifteen (39.47%) cases. So in accordance with most of the workers we found higher frequency of positivity with trephine biopsy as compared to bone marrow aspiration. In our study we found (07/15) discrepancy (aspiration negative and biopsy positive) in malignant lymphomas infiltrating to the bone marrow.

In our study no contraindication or complication due to either procedure of bone marrow were observed

even in a case of thrombocytopenia as most of the workers suggested.

In accordance with Gupta R. et al and other workers, in cases of Hodgkin's lymphoma, involvement of bone marrow not only suggests that the disease is generalized but also obviates the staging laparotomy⁴.

Bone marrow in 25% of our cases of Hodgkin's lymphoma comes within range of the reported incidence of bone marrow involvement i.e. 02 – 32%.

In non-Hodgkin's lymphoma, bone marrow involvement was found 43.33% against reported incidence of 16 – 73% in most of the literature. It is also clear that positive bone marrow patients have less favorable prognosis than the bone marrow negative patients and differ that it was more commonly involved in diffuse type than nodular but Stephens E. Jones et al mentioned that there was no significant difference between diffuse and nodular¹³.

Burkhardt R. et al told that B cell lymphoma is more frequently found in the bone marrow than those T cell lineage but we could not compare due to lack of immunophenotyping facilities in our centers³.

Munker et al found that bone marrow infiltration was associated with pancytopenia and ESR >40 mm/hr along with systemic features and Ramesh Chopra found fibrosis of the bone marrow was a common feature of Hodgkin's lymphoma but we didn't find the same, may be due to less number of cases^{8,9}.

In variation with Bartl et al we found no difference in prognosis between those cases of Hodgkin's lymphoma where bone marrow was infiltrated or the patients had other advanced diseases².

SUMMARY AND CONCLUSION

From the foregoing we conclude that

Bone marrow examination (aspiration and biopsy) of the smears and sections help to detect metastasis in the bone marrow in lymphomas and is essential for correct staging of the disease

Clot sections and touch imprint did not give the additional information in the present study.

Bone marrow examination has an important bearing on treatment and prognosis of the individuals. In advanced stage of Hodgkin's lymphoma patients,

there was no significant difference in prognosis, with or without bone marrow involvement. While in cases of non-Hodgkin's lymphoma bone marrow involvement is a less favorable prognostic sign than the patients without bone marrow involvement.

Serial aspiration and biopsy proved to be helpful to determine the prognosis and response to chemotherapy.

Critical examination of BM biopsies can increase the diagnostic accuracy, thereby contributing to the prognosis and appropriate treatment modalities.

Bone marrow biopsy was found superior to bone marrow aspiration.

In all the cases, which infiltrated to bone marrow, histological grades were same as in the FNAC / Histopathology examination at the time of diagnosis from the primary site.

In our study patients with bone marrow involvement in Hodgkin's lymphoma has more favorable prognosis than the non Hodgkin's lymphoma infiltrating to bone marrow.

Applications of additional studies using cytochemical, immunocytochemical, immunohistological, cytogenetics and molecular techniques will prove to be of critical importance in the evaluation of malignant lymphomas.

Conflict of Interest: None

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Prevalence of Candidiasis, Trichomoniasis and Bacterial Vaginosis among Women of Reproductive Age Group

Geeta Gupta¹, Sumi Nandwani², Alpana Agarwal³

¹Assistant Professor, Department of Microbiology, Santosh Medical College and Hospital, Ghaziabad (UP), ²Associate Professor, Department of Microbiology, ESI-PGIMS, ESI Hospital, New Delhi, India, ³Professor, Department of Obstetrics and Gynaecology, Santosh Medical College & Hospital, Ghaziabad (UP), India

ABSTRACT

Background: Vaginal symptoms are leading reason for patients to visit gynecologist. Few data are available on prevalence of different causes of vaginitis.

Objective: To find out prevalence of Candidiasis, Trichomoniasis and bacterial Vaginosis among the women of reproductive age group.

Method: 400 sexually active married women attended gynecology OPD and ANC clinic at Santosh Hospital, Ghaziabad included in study. Participants were interviewed and structured questionnaire were filled. Two high vaginal swabs were collected from each woman. One swab was used for making smear and other used for culture on SDA. Candidiasis was detected by presence of curdy white discharge, Gram stain and culture on SDA. Trichomoniasis was detected by presence of green yellow frothy discharge, Wet mount and Papanicolaou stain. Bacterial Vaginosis was detected by presence of homogenous white or grey discharge, Amsel method and Gram stain.

Results: Over all prevalence of vaginitis was 47.75 %. The prevalence of Candidiasis was 54.5% by Gram stain and 21.5% by culture method. The prevalence of Trichomoniasis was 12% by Wet mount and 8.75% by Pap stain. The prevalence of bacterial Vaginosis was 24% by Amsel criteria and 29% by Gram stain.

Conclusions: This study raised an awareness regarding high vulnerability of women in reproductive age group for vaginitis. The study reveals that prevalence of candidiasis is 21.5%, trichomoniasis 8.75% and bacterial vaginosis 29% .

Keywords: Vaginitis, Prevalence, Candidiasis, Trichomoniasis, Bacterial Vaginosis, Reproductive Tract Infection

INTRODUCTION

Reproductive tract infections (RTIs) are global health problem among women especially in reproductive age group in south east Asia region countries. It has become a silent epidemic that devastates women lives¹. Vaginitis is a common clinical presentation in RTIs which is characterized by abnormal discharge or vulvovaginal discomfort or both. An average of 4 to 7 organisms can be found upon routine culturing of vaginal discharge². Candidiasis, Trichomoniasis and Bacterial Vaginosis are responsible for 95% cases of vaginitis³.

These infections draw attention especially in developing countries like India where diagnostic and treatment facilities are extremely limited. If we incorporate simple laboratory tests in management of vaginitis cases, it can help us to distinguish between mixed and single infections reducing the

administration of unnecessary antibiotics and reducing the problem of drug resistance.

Hence the present study was undertaken to assess the prevalence of Candidiasis, Trichomoniasis and Bacterial Vaginosis among women of reproductive age group.

METHOD

The present study was conducted in the Department Microbiology, Santosh Medical College and Hospital, Ghaziabad on 400 sexually active married women attended gynaecology OPD and ANC clinic from January 2009 to June 2009. The inclusion criteria for the study were women of reproductive age group (15-49 years), sexually active women, women with history of discharge per vaginum, pregnant women and women with no other documented pathology. All perimenopausal women, women with

proven cervical and uterine pathology, women in premenstrual period, women suffering from HIV/AIDS, and women on hormonal/immunosuppressive therapy were excluded from the study. Informed verbal consent was obtained from each participant women. A predesigned and pretested proforma was filled. Approval was obtained from the Institutional Ethical Committee. After taking history, thorough gynaecological examination was done.

Two high vaginal swabs were taken from posterior fornix of vagina for collection of vaginal discharge (samples were collected during post menstrual period in non-pregnant women). One swab used for making smears and other used for culture on Sabouraud's Dextrose Agar (SDA).

Candidiasis was detected by presence of curdy white discharge and by Gram stain and culture on SDA.

Trichomoniasis was detected by presence of green yellow frothy discharge and strawberry vagina and by wet mount and Pap-stain methods.

Bacterial vaginosis was detected by presence of homogenous white/grey discharge, Amsel's criteria and by gram stain. Nugent score 7-10 indicates presence of bacterial vaginosis.

DISCUSSIONS

In present study prevalence of vaginitis was found 47.75 % (191 cases) Table 1. Prevalence of candidiasis was found 54.5% by gram stain and 21.5% by culture on SDA. The prevalence of trichomoniasis was found 12% by wet mount and 8.75% by pap-stain. By Amsel's criteria prevalence of bacterial vaginosis was found

24% and 29% by gram stain by Nugent's score (Table 2). P. Bhalla et.al. (2007), reported prevalence of bacterial vaginosis 32.8%, trichomoniasis 2.8%, candidiasis 16.9%, syphilis 4.7%, HIV infection 0.95%, gonorrhea 0.93% and C. trachomatis infection 0%⁴. Maitra Nandita et.al. (2008) observed the overall prevalence of Candidiasis, Trichomoniasis and Bacterial Vaginosis as 18.4 %, 10.9 % & 23.7 % respectively⁵.

Maximum numbers of cases were observed in the group between 26-30 years (Table 1 & 3), most probably because they are most sexually active. N. Maitra et.al. (2007) reported the mean age of women to be 27.37 \pm 5.52 years⁶.

Table 1: Agewise distribution of cases.

Age groups in Years	Number of Cases	Number of vaginitis cases
15 – 20	31	17
21 – 25	119	42
26 – 30	123	62
31 – 35	52	35
36 – 40	37	17
41 – 45	19	14
46 – 49	19	4
Total	400	191

Table 2: Prevalence of vaginitis as per diagnostic tests.

Infection	Diagnostic Test	No. of cases (%)
Candidiasis	Gram stain	218 (54.5)
	Culture on SDA	86 (21.5)
Trichomoniasis	Wet mount	48 (12)
	Pap. Stain	35 (8.75)
Bacterial vaginosis	Amsel criteria	96 (24)
	Gram stain	116 (29)

Table 3: Distribution of cases according to isolates.

Age groups (in years)	Candidiasis	Trichomoniasis	Bacterial Vaginosis	Mixed	No. Isolates	Total no.
15 – 20	12	0	3	2	14	31
21 – 25	9	3	22	8	77	119
26 – 30	20	7	18	17	61	123
31 – 35	11	2	13	9	17	52
36 – 40	3	0	9	5	20	37
41 – 45	2	3	6	3	5	19
46 – 49	0	0	4	0	15	19
Total	57	15	75	44	209	400

Of the total 400 cases, 326 women were found symptomatic and 74 were found asymptomatic for RTI/STI (Table 4). 227 (56.75%) women were aware about the presence of vaginal discharge as an indicator for vaginitis infection. The associated symptoms with vaginal discharge were found 128 (56.39 %) cases with lower abdominal pain, 86 (37.89 %) with itching, 68 (29.96 %) with increased frequency of micturition, 63 (27.75 %) with foul smell, and 10 (4.41 %) with blood stained discharge (Table 5). The most common symptom reported was vaginal discharge in 56.75 % women, followed by lower abdominal pain in 53.5 % women which was found similar to other studies. Srivastava A et.al. (2004) in their study of RTIs among married women also found vaginal discharge as most common presenting symptom in 43.48 % women⁷. Vineeta Gupta et.al. (2009) found vaginal discharge as most common complaint by women and bacterial vaginosis was commonest cause of vaginal discharge seen in 43.6 % patients, candidiasis in 10 % patients and trichomoniasis in 9.1 % patients⁸.

Table 4: Distribution of cases on the basis of pregnancy status and symptoms.

Pregnancy Status	Status	No. of cases (%)
Pregnant (n = 96)	Symptomatic	46 (47.92)
	Asymptomatic	50 (52.08)
Non pregnant (n = 304)	Symptomatic	280 (92.11)
	Asymptomatic	24 (7.9)

Table 5: Symptoms with vaginal discharge.

Symptoms*	No. of cases (n= 227)
Lower abdominal pain	128 (56.39%)
Itching	86 (37.89%)
Increase frequency of micturition	68 (29.96%)
Foul smell	63 (27.75%)
Blood stained discharge	10 (4.41%)

(* Most of the women reported more than one symptom.)

Table 6: Comparison of vaginal fluid wet mount versus pap-stain.

		P ap-stain		Total
		Positive	Negative	
Wet Mount	Positive	27	21	48
	Negative	8	344	35
	Total	35	365	400

Table 7: Frequency of diagnostic criteria in BV.

Diagnostic criteria	Women with BV (No.)	Women without BV (No.)	P value
pH > 4.5	96	64	< 0.001
Clue cells	96	0	< 0.001
Amine test positive	44	16	< 0.001
Grey vaginal discharge	62	170	> 0.05
Gram stain	116	0	< 0.001

Table 8: Comparison of gram stain versus Amsel's criteria for BV.

		Amsel's criteria		Total
		Positive	Negative	
Gram stain	Positive	88	28	116
	Negative	276	284	
Total	96	304	400	

Vaginal discharge culture is most sensitive method available for its accurate diagnosis. The two other simple tests are estimation of vaginal pH and microscopic examination of vaginal secretions. In present study, culture for candida species was positive in 86 women. This gave a prevalence of VVC as 21.5% (Table 2). Mohanty et.al. (2007) reported prevalence of VVC 18.5%⁹ which is similar to studies from India and elsewhere with rates ranging from 20.8% - 23%. The study shows the prevalence of albicans species (70.93%) higher than non-albicans species (29.07%).

Estimation of vaginal pH, an inexpensive and simple test has been greatly under used in cases of suspected VVC (Sobel JD et.al.1998)¹⁰. Numerous studies have reported that in VVC, vaginal pH remains same normal range. In the present study, normal vaginal pH was observed in 57 of 86 (66.28%) culture positive women. Vaginal pH in excess of 5 in remaining 29 (33.72%) culture positive women in our study could be because of mixed infection (candida, bacterial and protozoal infections). Mixed infection was found in 44 (11%) Table 3. Sobel JD et.al.(1998) reported true frequency of mixed infection is not exactly known but is estimated at about 10%¹⁰.

In present study microscopy for yeast cells and pseudohyphae was found positive in 74 of 86 (86.05%) culture positive women. Sobel JD (1999) reported 65% - 85% sensitivity of microscopic examination and found it to be a very sensitive, valuable and simple method of diagnosis of VVC¹¹. Jindal Neerja et.al.(2006) reported microscopy for yeast cells and pseudohyphae was found positive in 78 of 92 (84.8%) culture positive women¹². The difference in sensitivity of direct microscopy could be because of difference in candida concentration in vaginal secretions. Direct microscopy is reliable only if the infection is fairly heavy (Sobel JD 1999)¹¹. Therefore, in cases where microscopy fails to provide an answer, vulvovaginal swab culture becomes essential for elucidation of diagnosis of VVC.

Prevalence of Trichomoniasis was found 8.7% by pap-stain. 8 cases were not detected by wet mount which were later on detected by pap-stain, because of insensitive wet mount procedure (Table 6). The Earlier

studies by Beal et.al.(1992) had also reported that pap-stain is potentially difficult but it can detect cases which remain undiagnosed by wet mount. Culture is usually considered most sensitive technique but it is not widely available and is difficult to be performed in routine clinical laboratory till now¹³.

The sensitivity and specificity of wet mount for diagnosing trichomoniasis considering pap-stain as laboratory based test were 77.14% and 94.24% respectively (Table 6) which correlated well with study by Sood S. et.al.2007 (sensitivity wet mount-55%)¹⁴. Wet mount specificity suggests that some positive wet mount results may be false positive possibly because of morphotypes resembling *T. vaginalis*. Previous studies have also reported the sensitivity of wet mount and culture for diagnosing the *T. vaginalis* infection as 40% - 70% and 86% - 97% respectively (Krieger JN 1981)¹⁵. The diagnostic sensitivity and specificity of Pap-smear read by experienced cytopathologists have been reported as 33% - 79% and 89% - 100% respectively (Rongpisuthipong A et.al.1987)¹⁶.

Commonly wet mount preparation has been the sole diagnostic test used in studies of *T. vaginalis* epidemiology and therapy. Our data on the sensitivity of wet mount suggests that caution should be used in evaluating the result of these studies. The complete evaluation of Trichomoniasis must include pap-stain and culture if possible when wet mount preparation fails to identify the *T. vaginalis*. Pap-stain also has an additional advantage that it can be kept as a permanent record.

Table 2 shows the prevalence of bacterial vaginosis, 96 (24%) by Amsel's criteria and 116 (29%) by gram stain Nugent score. The highest prevalence was found in age group 26-30 year. Garg S et.al.(2002) reported bacterial vaginosis prevalence 41%¹⁷. Higher prevalence reported in this study could be because of more than one method used for diagnosis of bacterial vaginosis. P. Bhalla et.al.(2007) found prevalence of bacterial vaginosis 32.8%⁴. This shows that prevalence of bacterial vaginosis varies widely among different areas and communities within the country. The contrasting prevalence figures may be because of various reasons such as differences in economic status and education background, study population and method used for diagnosis of bacterial vaginosis.

Bacterial vaginosis (score >7) was found in 29% (116) of women while a shift from normal flora (score 4-6) was observed in another 33% (132) of women.

Sewankambo et.al.(1997) reported bacterial vaginosis in 50.8% and intermediate flora in 31.7% women. An intermediate score 4-6 may be found among women who were either recovering from bacterial vaginosis or may develop bacterial vaginosis subsequently. Such women therefore should be followed up to confirm the same as these alterations in vaginal microflora may increase the risk of acquisition of other STIs including HIV infection¹⁸.

Bacterial vaginosis is an important risk factor for preterm births, as well as upper vaginal tract infections in the non-puerperal patients. Among the individual Amsel's criteria used to diagnose bacterial vaginosis (Table 7), a raised pH is recognized as the most sensitive (82.76%) but least specific (77.47%). Amine test was found least sensitive (37.93%) and highly specific (94.37%). False positive amine test occurs rarely. However, BV may be misdiagnosed because of sub optimal sensitivity and relatively subjective nature of current individual diagnostic variable (Schwebke JR et.al.1996)¹⁹.

The development of a standardized method using vaginal gram stain for diagnosis of BV was an attempt to provide an objective, reproducible laboratory based test. Gram stain provides a direct look at the bacterial morphotypes and thus is unaffected by factors such as menstruation or recent intercourse, which may alter pH and technical variables such as observer interpretation of clue cells. The vaginal gram stain has been shown to have excellent intra and inter observer reproducibility.

In study, sensitivity and specificity of gram stain for diagnosing bacterial vaginosis considering Amsel's criteria as clinician gold standard was 91.67% and 90.79% respectively (Table 8), which were correlated with study done by Schwebke JR et.al. 1996 (sensitivity 90.7% and specificity 83.9%)¹⁹. The specificity of gram stain (90.79%) suggests that some (28 cases) positive gram stain results are false positive due to the bacterial morphotypes present on slide are identical to those seen in BV patients, although the patient does not fulfill the Amsel's criteria. Because there is a spectrum of symptomatology in patients with BV, change on gram stain may occur without development of syndrome. However, an alternative explanation is that these results represent true positives for the syndrome of BV that were missed by the traditional constellation of clinical findings. Also, the subjective nature inherent in the evaluation of clinical criteria may result in significant under diagnosis of BV. Thus, we conclude

that vaginal gram stain based diagnosis is more reliable and an easy method of diagnosing BV and can be useful where facility for using Amsel's criteria are not available.

CONCLUSION

This study raised an awareness regarding high vulnerability of women in reproductive age group for vaginitis. The study reveals that prevalence of candidiasis is 21.5%, trichomoniasis 8.75% and bacterial vaginosis 29% by laboratory tests.

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Oral and Periodontal effects Associated with the use of Betel Nut and Tobacco

Gururaj Naregal¹, B Chandrashekar Raju², C Sumanth S³

¹Prof, Department of Periodontics, ²Lecturer Department of Oral Pathology, S J M Dental College and Hospital, Chitradurga, Karnataka, India, ³Reader, Department of Periodontics, Rangoonwala College of Dental Sciences, Pune-02, Maharashtra

ABSTRACT

Betel nut and tobacco chewing is prevalent in India and South-East Asia. These habits are socially accepted as they are strongly associated with social and cultural traditions. Betel nut and tobacco are being used in various forms like pan with flavoring agents or betel nut with or without tobacco. Betel nut and tobacco chewing has been associated with pre-cancerous lesions, conditions and oral cancer. There is also a strong association of these habits with periodontal diseases. This review will focus on the oral and periodontal effects of betel nut and tobacco chewing.

Keywords: Smokeless Tobacco, Betel Nut, Areca Nut, Periodontal Effects

INTRODUCTION

The custom of chewing betel nut is an ancient one extending back in time to at least several centuries B.C. The habit probably originated in the region of the Indian Sub-continent and from there spread to other parts of Asia. In India, betel nut usage is intimately linked with a number of social and cultural traditions. The habit becomes incorporated into the personal and social rhythm of the individual because of its mild but reliable stimulant effect is regarded as contributing both to social situations and to routine aspects of life.

Betel nut chewing has been reported to have a number of effects that makes it attractive to the user. These include its stimulant or euphoric action, the propensity of saliva stimulation, the aiding of digestion and satisfaction of hunger, its supposed strengthening effects on the teeth and gums and its actions as a breath sweetener.

Betel nut usage with or without tobacco has been identified with number of oral lesions and conditions such as leucoplakia, erythroplakia, oral sub-mucous

fibrosis, oral squamous cell carcinoma, dental caries and periodontal diseases. Betel nut usage may cause or worsen conditions that involve tremors, muscle stiffness, involuntary facial movements or difficulty in moving parts of the body. The use of smokeless tobacco has been associated with cardiovascular diseases⁵ and seen to cause adverse outcomes in pregnancy.¹⁴

Forms in which Betel Nut is Used

Betel nut chewing is predominantly in the form of "pan" or "beeda" which comprises a mixture of ingredients, with or without tobacco, wrapped in betel leaf. This bolus is then placed in the mouth (commonly in the buccal vestibule) and chewed.²⁷

Many tobacco companies are now making 'ready made' pan mixtures that are available in sachets sold as "pan masala" (without tobacco) and "gutkha" (with tobacco). It is also used as 'Khaini' which is powdered tobacco, slaked lime paste mixture occasionally used with areca nut.

Forms in which Smokeless Tobacco is Used²⁷

Mishri - which is dark roasted powdered tobacco.

Zarda - Tobacco leaf boiled in water with lime and spices until evaporation. Residual tobacco is then dried and colored with vegetable dyes.

Kiwam - Destalked tobacco leaf boiled in water with rose water and spices (example. Saffron,

Corresponding author:

Gururaj Naregal

Professor

Department of Periodontics,

S.J.M. Dental College and Hospital, Chitradurga
Karnataka, India

Contact no.: +919886484851. Fax no.: 08194220046

Email: raju.chandru@gmail.com

cardamom, musk). Used as a thick paste or, if further dried, as granules or pills.

Gudakhu - A paste of powdered tobacco, molasses and other unspecified ingredients.

Smokless tobacco is mostly placed in the buccal vestibule, labial vestibule or in the floor of the mouth for a period of 30 minutes or more.

INGREDIENTS OF PAN

Pan or Betel quid is a mixture of betel nut, stimulants, sweetening and flavoring agents with or without tobacco wrapped in a betel leaf (Fig.1).²⁷

The basic ingredients are

1. Areca nut (betel nut): The nut is cured by sun drying, roasting or boiling it. Key compounds in it are tannins and alkaloids. Main alkaloid is arecoline. Other alkaloids like arecaidine, guacine, guvacoline and areaolidine are also present. Arecoline is cholinomimetic and has both central and peripheral nervous system effects.
2. Betel leaf (part of betel vine, stalk, pods): The main constituent is a volatile oil known as betel oil. It contains two phenols, beta-phenol (chavibetol) and chavicol. It also contains carbohydrates, proteins, chlorophyll and other minerals. These leaves are widely believed to have medicinal properties such as stimulant antiseptic and as a sialogogue.
3. Slaked lime: It is made up of Calcium hydroxide. It increases the Ph of the mixture and this aid in easier absorption of nicotine via the mouth lining when used. It also contributes to the red color of pan.
4. Catechu: This is used to bind the ingredients in the quid into a consistent paste. It also aids in chewing.
5. Tobacco: It is the most hazardous ingredient in pan. The forms of tobacco added are: semi-cured whole tobacco leaf, shredded leaf, extract of tobacco in glycol gel, ground tobacco (wet snuff) or masala tobacco (dry snuff).
6. Flavoring agents such as cinnamon, cloves, sandalwood, cardamom, coconut, ginger, sweetening agents such as gul-kand.

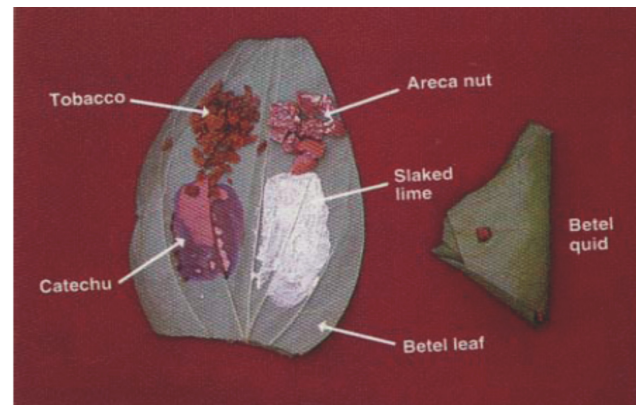


Fig. 1. Ingredients of pan

Oral Effects of Betel Nut and Tobacco Chewing

Chewer's Mucosa

A condition of the oral mucosa where, because of either direct action of the quid or traumatic effect of chewing, or both, there is a tendency for the oral mucosa to desquamate and peel.¹⁸ More than 60% of betel nut chewers have betel chewer's mucosa.¹⁹ Buccal mucosa is most frequently involved.¹⁹ The presence of the lesion is significantly associated with duration of the habit and number of quids per day.¹⁹ The presence of mucosal lesions is higher in quid chewers who also use tobacco.²⁰

Leucoplakia, Erythroplakia, Erythroplakia-like Lesions

High prevalence of leukoplakia (Fig.2) and other related oral lesions has been reported among smokers, betel nut and tobacco chewers and alcoholics.^{13, 20} Buccal mucosa in chronic chewers may show an ill-defined whitish gray discoloration that cannot be rubbed off.²⁹ The mucosa in addition may show a rough linen-like texture and histologically show ortho-keratinization and/or para-keratinization.¹³

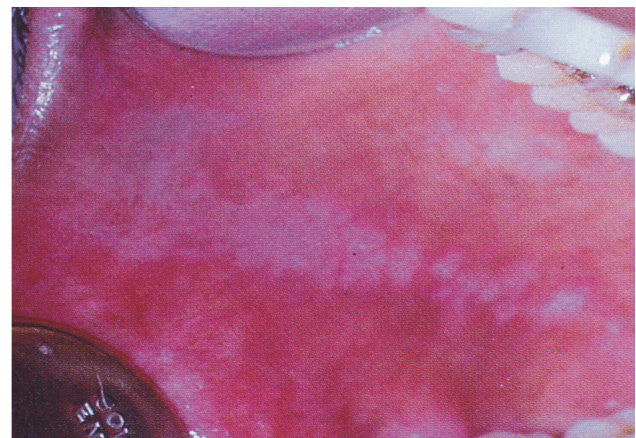


Fig. 2. Leukoplakia

Erythroplakia may also occur in conjugation with leukoplakia.²³ Although erythroplakia is less common than leukoplakia, it has a much greater potential to be severely dysplastic at the time of biopsy or to develop malignancy later.

Oral Sub-mucous Fibrosis (Fig.3)

Fibrosis of the oral mucosa takes place due to chronic chewing with reduced mouth opening and burning sensation of the mucosa.

The mucosa may show

- Palpable fibrous bands.
- The mucosal texture feels rough and leathery.
- Blanching of the mucosa together with histopathological features like atrophic epithelium with loss of rete-ridges and juxta-epithelial hyalinization of lamina propria.



Fig.3. Oral submucous fibrosis

There is a significant association of sub mucous fibrosis with areca nut chewing without tobacco.²⁸ Habitual chewing of pan masala/gutkha is associated with earlier presentation of sub mucous fibrosis than betel quid use.⁴ Factors which may be responsible for these differences are the tobacco content, the absence of betel leaf in pan masala and gutkha and much higher dry weight of pan masala and gutkha.⁴

Oral Squamous Cell Carcinoma

The possibility that betel chewing is a cause of oral squamous cell carcinoma(Fig.4) has been recognized for many years. Some evidence points to tobacco

incorporation in betel quid and associated tobacco habits such as smoking and also alcohol consumption being of prime importance.^{12, 17}

WHO has concluded that

- There is sufficient evidence that the habit of chewing betel quid containing tobacco is carcinogenic to humans.
- There is inadequate evidence that the chewing of betel quid without tobacco is carcinogenic to humans.²⁶

The WHO has also concluded "there is sufficient evidence that the combined effects of smoking tobacco and chewing betel quid without tobacco causes oral and pharyngeal cancer".²⁶

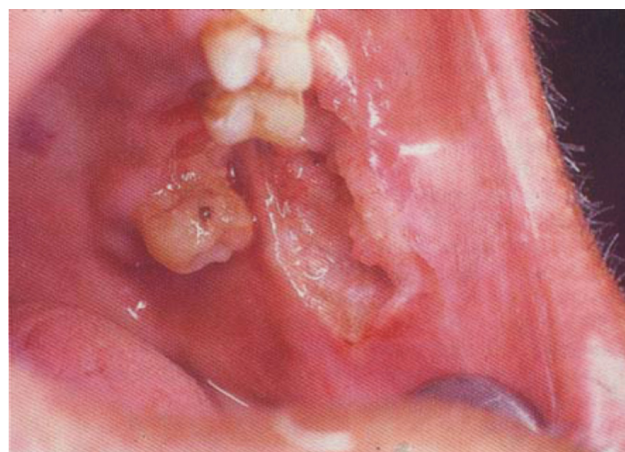


Fig. 4. Oral squamous cell carcinoma

There is a six-fold increased risk for cancer of the oral cavity with chewing tobacco.⁹ A strong significant association and dose response relationship was observed for cancers of the tongue, gingiva, floor of the mouth and oral cavity.²² Oral cancer occurred solely among those who practiced chewing tobacco in some form.²⁰ Malignant transformation of leucoplakia was not observed in those who smoked but did not chew tobacco.²⁰

Periodontal Effects (Fig.5)

Periodontal diseases are multi-factorial. Oral hygiene and the environmental factors play a major role in causation of periodontal diseases. Generally betel nut and tobacco chewers have a poor oral hygiene. Thus they may be more susceptible to these diseases.

There is evidence that betel chewing may be associated with periodontal diseases.²⁵

Betel quid ingredients like arecoline are cytotoxic and impair the fibroblast functions and may have a deleterious effect of the gingival tissues. Thus betel nut chewing may lead to periodontal breakdown.^{6, 7} Betel quid chewers harbor higher levels of infection with *Actinobacillus actinomycetemcomitans* and *Porphyromonas gingivalis* than non-betel quid chewers.¹⁵



Fig. 5. Periodontal breakdown

Betel quid chewing was associated with higher prevalence of bleeding on probing where higher clinical levels of disease existed and with a likelihood of subgingival infection with *Actinobacillus actinomycetemcomitans* and *Porphyromonas gingivalis*.¹⁵ Similar association of betel chewing with significant increase in bleeding on probing has been shown in other studies.¹

Majority of the people have habit of chewing betel nut with tobacco and/or smoking tobacco. It has been reported that tobacco use may have a synergistic effect on the betel nut induced toxicity. Thus, people who have betel nut who use betel nut with tobacco or who are also smokers, may be more susceptible to periodontal damage, than people who chew only betel nut.⁸

On the contrary some researchers opine that betel nut and tobacco may not be necessarily associated with severe forms of periodontal disease. Instead they found that, only the sites where the quid is places showed a significantly greater recession and attachment loss than in sites not adjacent to lesions in users or comparable sites in non- users.²¹

The odds of having gingival recession were found to be 9 times greater in tobacco chewers when compared to non-users.¹⁶ It was also seen that people with good oral hygiene tobacco chewing was not

associated with a prevalence of gingival recession, whereas in individuals with co-existing gingivitis, a marked increase in prevalence of gingival recession and mucosal pathology was observed.¹⁶

Some studies failed to establish a clear relationship between generalized periodontal condition and smokeless tobacco use.³ Also the prevalence of dental caries, gingivitis and plaque were not shown to be different in smokeless tobacco users and non-users.¹⁰

Based on these studies it can be concluded that betel nut and tobacco chewing may be associated with increased bleeding on probing and gingival recession with loss of attachment. But severe periodontal diseases may not be directly associated with betel and tobacco chewing habits.

Also people with poor oral hygiene having habit of betel and tobacco chewing may be considered as high-risk cases for periodontitis.²

Other Oral Effects

Studies have not conclusively established the relationship of betel chewing and dental caries. Some studies have reported a decrease in the prevalence.¹⁶ On the contrary chewing tobacco has been suggested as a risk factor in developing root caries and coronal caries.²⁴

Betel and tobacco chewing causes staining of the teeth, oral mucosa, and composite restorations.¹ Halitosis, reduction of taste and smell acuity has also been associated with betel chewing.²¹ Attrition of the teeth is a common outcome of constant chewing habit.²¹

Oral tobacco use has been reported for the effects in preventing aphthous stomatitis. It was concluded that systemically absorbed nicotine was the product that was responsible for reduction of aphthous ulcers.¹¹

CONCLUSION

Oblivious to the adverse effects of betel nut and tobacco chewing, there is an increase in the number of people succumbing to these habits. Betel nut and tobacco chewing being socially more acceptable than smoking may be one of the reasons for this. The government has taken stringent measures like packet statutory warnings, ban on sales promotion, increased taxation has affected only the organized sector and that too to a very small degree. Most of the pan or betel quid is made and sold in petty shops, which fall under unorganized sector. The non- governmental

organizations, health care professionals are conducting awareness campaigns spreading the message of ill-effects of these habits. But whatever the efforts, unless the general population realizes the risks associated with these habits, only then we can expect a downtrend.

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Combined Exercise Program Reduces C- Reactive Protein in Obese Women

Hany Ezzat Obaya¹, Basant Hamdy¹

¹Lecturers of Department of Physical Therapy for Cardiovascular/Respiratory Disorder and Geriatrics, Faculty of Physical Therapy, Cairo University, Egypt

ABSTRACT

Objective: The present study examined Anthropometry, C-reactive protein (CRP) and physical function in obese women after combined exercise program.

Materials and Method: Obese women (n= 40; from 20-30 years; BMI; 35.0-39.9 kg/m²) were recruited for a 3 month trial. Participants were divided into group I (n=12; age from 20 to less than 25) and group II (n=28; age from 25 to 30). Participants in both groups had been received a combined aerobic and anaerobic exercise program 3 days/week. Anthropometry, CRP and physical function (4 meter walking velocity, chair rising test time, 6 min walking distance, hand grip strength) were assessed at baseline and 3 month.

Result: In both groups, the results revealed significant increase in all measurements ($p < 0.05$) except CRP level, chair rising test time, and BMI which exhibited significant reduction ($p < 0.05$). The effect of age showed that there was no significant difference between the two groups ($p > 0.05$).

Conclusion: Results provide evidence that combination of aerobic and anaerobic exercises experienced by obese adults can reduce CRP level and improve physical function. This can be translated into enhanced quality of life.

Keywords: Exercise, CRP, Physical Function, Obesity

INTRODUCTION

A recent explosion in the cardiovascular risk has swept across the globe. Primary prevention is the preferred method to lower cardiovascular risk. Lowering the prevalence of obesity is the most urgent matter.⁽¹⁾

Adipose tissue serves as an endocrine organ, secreting a host of inflammatory cytokines including IL-6, which stimulates hepatic production of C-reactive protein (CRP).⁽²⁾ CRP is an acute phase protein in the pentraxin family.⁽³⁾ It is elevated in obesity and its concentration correlates with cardiovascular risk.⁽⁴⁾ The elevation of CRP may contribute to poorer physical performance and physical disability via decreases in skeletal muscle protein content and loss of muscle mass and strength.⁽²⁾

Various studies have shown the benefits of weight reduction.⁽⁵⁾ Therefore, there must be attractive and persuasive evidence of weight-loss benefits in everyday function to motivate obese women to lose weight. Thus, the goal-setting should focus on positive

weight-loss effects, not only the number of kilos lost.⁽⁶⁾ So the aim of this study was to investigate the effects of combined exercise program on CRP level and physical functions in obese women.

MATERIALS AND METHOD

Participants

Participants (n = 40) were recruited for the trial. Eligibility criteria included: being woman, class II obesity⁽⁷⁾ unmarried, from 20 to 30 years of age, did not participate in regular physical activities three months before the study, stable weight maintenance (i.e., no weight loss or diet). Individuals were excluded if they had musculoskeletal disorder, cardiopulmonary diseases, metabolic disorders or any systemic problems affecting the results.

ETHICAL CONSIDERATION

All participants gave written informed consent to participate in the study according to the guidelines of the physical therapy, Cairo university, Egypt college

institutional review board.

DESIGN AND INTERVENTION

Participants were divided into two groups: Group I (n=12) ranged age between 20 to < 25 years and Group II (n=28) ranged age between 25- 30 years. Both groups received the same structured exercise training program 3 days/week for 60 min/session during 3 months. The exercise program consisted of: a warm-up phase (5 minutes), an aerobic phase (15 minutes), a strength phase (20 minutes), a second aerobic phase (15 minutes), and a cool-down phase (5 minutes)⁽⁸⁾ The mode of aerobic training was walking. The intensity of aerobic exercise was 60% -75% of the age-predicted heart rate reserve. Participants were regularly monitored throughout the exercise program and their heart rates recordings during the exercise sessions. Strength training included multigym (mild resisted exercises for lower and upper limbs). Two sets of 12 repetitions were performed at each exercise, with resistance being progressively increased during the intervention as strength improved. Rest interval separated each exercise from 1-1.5-minute. Warm-up and cooling down phases were in the form of respiratory and flexibility exercises for upper and lower limbs.

MEASUREMENTS

All variables were collected on all participants at baseline and after the 3-month intervention.

Graded Exercise Test:

A graded exercise test using a symptom-limited Naughton protocol was performed during initial testing and was used as an exclusion criterion and to establish an individually tailored exercise prescription for participants.⁽⁹⁾

Anthropometry measures

Body Weight, Height, and body mass index (BMI) were obtained using standard techniques.

C-reactive protein

Venous blood samples were drawn in the morning after an overnight fast. The samples were immediately centrifuged and stored at -80°C until final analysis.⁽¹⁰⁾

Physical Function

This variable was assessed through physical performance tasks included:

1. 6-minute walk distance in which participants were instructed to walk as far as possible in a 6-minute time on an established course. They were not allowed to carry a watch and were not provided with feedback during the trial. Performance was measured in the total distance covered. This test is significantly correlated to treadmill time and symptom limited maximal oxygen consumption and has a 3-month test-retest reliability of 0.86.⁽¹¹⁾
2. Repeated chair rising test in which participants sat in a straight-backed chair with arms fold across the chest and stood five times consecutively as quickly as possible. The time of 5 completed chair rises was measured.⁽¹²⁾
3. Four-meter walking velocity in which participants walked at their usual pace over a 4-meter course in indoor. The time was taken and used to compute walking speed.⁽²⁾
4. Hand grip strength was measured in both hands using an adjustable grip strength dynamometer. Three trials were made with a pause of about 10-20 seconds between each trial to avoid the effects of muscle fatigue. The maximum overall value was used in the analyses.⁽²⁾

DATA ANALYSES

All analyses were performed on SPSS version 16.0 (SPSS, Inc., Chicago, IL). Data was tested for normality using Kolmogorov-Smirnov test. The quantitative variables were expressed as mean \pm standard deviation (SD). Comparison of variables before and after intervention was done using paired t-test. Comparison between 2 different groups was done using unpaired T-test. Pearson's correlation co-efficient "r" used to assess the correlation between each quantitative variable in all subjects. All P-values in the analysis were considered statistically significant when P < 0.05.

RESULTS

Group I (n=12) where age ranged between 20 to less than 25 and this group constituted 30% from the whole sample. Group II (n=28) where age ranged between 25 to 30 years and this group constituted 70% from the whole sample.

The demographic profile of the patients is shown in Table 1. At baseline, there were no statistically significant differences in between the two groups.

Table 1. Demographic Characteristics of the study sample

Characteristics	Groups	Mean+ SD	p-Value
Weight (Kg)	Group I	95.3 ± 6.1	>0.05 ^a
	Group II	92.9 ± 8.2	
Height (Cm)	Group I	160 ± 2.2	>0.05 ^a
	Group II	159 ± 6.4	
BMI (Kg/m ²)	Group I	37.03 ± 1.3	>0.05 ^a
	Group II	36.6 ± 1.5	

SD: Standard deviation. ^a Non-significant**ANTHROPOMETRY RESULTS**

Means for baseline and 3 month measures are shown in table (2). In both groups, anthropometrics has been decreased significantly following the exercise program (p=0.000), table 2 showed no significance differences in anthropometrics at baseline and after 3 month.

Table 2. Anthropometrics of the groups pre- and post-treatment

Variables	Groups	Pre M± SD	Post M± SD	p-Value
Weight	Group I	95.3 ± 3.4	84.3 ± 8.2	0.000 ^b
	Group II	92.9 ± 8.2	82.1 ± 8.6	0.000 ^b
BMI	Group I	37.03 ± 1.3	32.7 ± 2.3	0.000 ^b
	Group II	36.6 ± 1.5	32.3 ± 1.9	0.000 ^b

M± SD: mean ± standard deviation; ^b: significant; BMI: body mass index.

C-reactive protein result

In both groups, CRP has been decreased significantly following the exercise program (p=0.000), table 3 showed significant difference was found between the groups at either pre or post treatment measurements (p>0.05).

Table 3. CPR values of the groups pre- and post-treatment

Variables	Groups	Pre M+ SD	Post M+ SD	% of change	p-Value
C-reactive protein	Group I	9.1 ± 3.4	3.1 ± 2.1	66.3 ± 14.7	0.000 ^b
	Group II	10.5 ± 5.6	5.1 ± 4.4	57.5 ± 23.3	0.000 ^b

M± SD: mean ± standard deviation; ^b: significant**Physical function results**

Regarding physical function, all the parameters pre and post treatment of both groups have been increased

significantly following the exercise program except chair rising test time which has been decreased significantly after intervention in both groups (p=0.000), according to table 4.

Table 4. Physical function values of the groups pre- and post-treatment

Variables	Groups	Pre M+ SD	Post M+ SD	% of change	p-Value
6 min distance	Group I	356.4 ± 49.4	402.0 ± 39.8	13.4 ± 7.5	0.000 ^b
	Group II	354.5 ± 46.1	401.1 ± 38.5	13.8 ± 8.1	0.000 ^b
4 meter velocity	Group I	0.81 ± 0.16	1.2 ± 0.29	41.6 ± 21.1	0.000 ^b
	Group II	0.79 ± 0.16	1.06 ± 0.29	35 ± 25.1	0.000 ^b
RT HG	Group I	23.3 ± 3.3	26.7 ± 3.5	14.9 ± 5.8	0.002 ^b
	Group II	24.9 ± 4.7	27.5 ± 4.8	11.7 ± 9.2	0.000 ^b
LT HG	Group I	20.6 ± 3.2	23.5 ± 4.5	13.5 ± 10.1	0.000 ^b
	Group II	22.2 ± 4.3	24.3 ± 3.9	9.8 ± 8.4	0.000 ^b
Chair rising test time	Group I	12.1 ± 1.7	9.7 ± 1.2	19.5 ± 8.1	0.000 ^b
	Group II	12.7 ± 3.9	10.2 ± 1.9	18.1 ± 12.6	0.000 ^b

M± SD: mean ± standard deviation; ^b: significant; HG: hand grip**Correlations between age, BMI and physical function**

Table 5 showed correlations between age, BMI, physical function and CRP in the first group. Both age

and BMI (before and after intervention) had no significant (P>0.05) correlation with any of the studied parameters.

Table 5. Correlations between age, BMI, physical function and CRP in the first group

Parameters after intervention		Age	BMI before	BMI after
6 min test	r	0.49	-0.37	-0.31
	p	0.102	0.235	0.320
4 meter velocity	r	0.13	-.57	-.342
	p	0.668	0.045	0.173
RT hand grip	r	0.20	-0.34	-0.03
	p	0.526	0.274	0.932
LT hand grip	r	0.20	-0.14	-0.04
	p	0.537	0.663	0.882
Chair rising test	r	-0.48	-0.14	-0.05
	p	0.113	0.665	0.867
CRP	r	-0.40	0.24	0.17
	p	0.203	0.420	0.588

r = Pearson correlation coefficient

Table 6 showed correlations between age, BMI, physical function and CRP in the second group. Age had no significant ($P > 0.05$) correlation with any of the studied parameters. BMI before intervention had a significant inverse intermediate correlation with 6 min test ($r = -0.46$, $P = 0.013$) also, BMI before intervention had a significant direct intermediate correlation with CRP ($r = 0.51$, $P = 0.006$). Regarding BMI after intervention, it showed a significant inverse intermediate correlation with 6 min test ($r = -0.43$, $P = 0.021$) and had a significant direct intermediate correlation with CRP ($r = 0.53$, $P = 0.004$).

Table 6. Correlations between age, BMI, physical function and CRP in the second group

Items after intervention		Age	BMI before	BMI after
6 min test	r	-0.03	-0.46	-0.43
	p	0.988	0.013 ^a	0.021 ^b
4 meter velocity	r	-0.04	-.31	-.23
	p	0.986	0.104	0.248
RT hand grip	r	0.02	-0.12	-0.06
	p	0.914	0.532	0.759
LT hand grip	r	0.09	-0.15	-0.15
	p	0.646	0.434	0.449
Chair rising test	r	-0.07	0.16	-0.07
	p	0.717	0.403	0.738
CRP	r	0.24	0.51	0.53
	p	0.215	0.006 ^a	0.004 ^b

^b :Significant

DISCUSSION

Inflammation has been hypothesised as a potential mediator of the association between obesity, physical inactivity and the development of chronic diseases,

such as cardiovascular disease and type 2 diabetes. Systemic CRP is a sensitive marker of low-grade systemic inflammation and is an independent risk factor for CVD.⁽¹³⁾

The present study examined the effect of combined exercise program on CRP level and physical function and also, studied the effect of age. The results of this study revealed significant reduction in anthropometrics and CRP level and significant improvement in physical function with no significance difference between the groups.

Age of women selection is between 20 to 30 years to avoid any associated diseases and to be included in apparently healthy obese type.

In our study we selected female participants only and this is in agreement with (Huffman et al,2010)⁽¹⁴⁾ who reported that the prevalence of obesity between females is more than males and also females exhibited a strong association for both waist circumference and BMI with CRP, regardless of diabetes status.

There is sufficient evidence to suggest that physical activity lowers inflammatory biomarkers in a variety of settings and populations which came in agree with our results. Studies that have demonstrated reductions in CRP concentrations range from 16% to 41%. The average change in CRP associated with physical activity appears to be at least as good, if not better, than currently prescribed pharmacological interventions in similar populations.⁽¹⁵⁾

The reduction of CRP could be explained as follows; adipose tissue produces approximately 25% of the systemic IL-6, which is responsible for signaling the liver to secrete CRP. Therefore, higher levels of body fat are likely to be associated with higher CRP levels; conversely, reductions in body fat are expected to lower CRP. Regular physical activity has anti-inflammatory properties.^(13, 15)

In addition to reduction in CRP, we found improvement in physical function. Obese adults prefer to walk more slowly depending on the degree of obesity to reduce their acute metabolic rate, thus making walking more comfortable. These observations could be the reflection of the overall impairment of physical fitness as a consequence of obesity and its metabolic complications.

Our intervention may have improved muscle power and physical fitness which helped to increase physical performance.

A moderate weight loss intervention that incorporates calorie restriction +/- exercise training has previously been shown to improve physical function in obese adults which support our trial results.^(8,16)

CONCLUSION

The results of this study provide evidence that the combination of aerobic and anaerobic exercises experienced by obese adults can reduce CRP and anthropometry measures and increase physical performance. This can be translated into enhanced quality of life.

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Internet use among Medical Students in an Institution in South India

Sharma D¹, Kumaresan K¹, Ashok B²

¹Assistant Professor, ²Assistant Professor (Statistics), Department of Community Medicine, Melmaruvathur Adhiparasakthi Institute of Medical Sciences and Research (MAPIMS), Melmaruvathur, Tamil Nadu

ABSTRACT

Background: The Internet plays a crucial role in access to information resources and has got many implications in the field of medicine and health. The use of internet is increasing among medical students for various purposes, therefore we carried out a cross sectional study among undergraduate students, with the objective of assessing the pattern of internet use in Melmaruvathur, Tamilnadu, South India.

Methods: A self administered, pre-tested semi-structured questionnaire was administered to a group of 285 undergraduate medical students. The information obtained includes the socio-demographic profile of students, access to internet, frequency and purpose of use. Data analysis was done using SPSS v16.

Results: Among 285 study participants, majority, 51.2 % were in the age group 18 - 19 years with a mean age of 17.94 years. Female students were more among them, 51.9%. Overall, 84.9% of the students had experience with internet use. Among them, 55.4% were using it regularly and 28% occasionally. Library (44.2%) was the most preferred place to use internet services, followed by hostel (26.7%) and home (23.5%). About half of the students, 50.2% were using internet for personal purposes and 30% for academic purposes with remaining using it for both. Regarding personal use, entertainment and social networking activities are used by most of the students. Google was the most preferred search engine used by 75.8% of the students and majority (87.7%) felt that information communication technology tools would be useful for academic and learning activities. Significant relationship between gender and purpose of internet use ($p < 0.01$) was noted among the students.

Conclusion: Majority of the students had experience with internet use, but the frequency, purpose and pattern of use is variable, with less realization of internet as a learning tool. More internet facilities should be available and accessible in medical institutions and should equip the students with adequate skills for better utilization of internet resources.

Keywords: Internet Use, Medical, Students, Education, Information, Technology

INTRODUCTION

Information and communication technology (ICT) have revolutionized our society over the past few decades, of which internet is one of the most important scientific development. Since its introduction to public

use, it has radically changed the way many people work and think ¹. Medical science is no exception to that. It is one of the fastest growing source of health information, with over five million websites worldwide, of which 100,000 are health related ².

Internet provides a wealth of information in relation to diseases, therapeutic procedures, pharmaceutical products ³ and access to databases, online meetings and journals ⁴. It is a cost effective medium of communication in meeting the various needs of interest and has brought profound changes in the healthcare delivery systems across the globe ranging from education and training to diagnosis of diseases and patient management ⁵. According to one estimate,

Corresponding author:

Dhananjaya Sharma

Assistant Professor,

Department of Community Medicine,

Melmaruvathur Adhiparasakthi Institute of Medical Sciences and Research (MAPIMS),

Melmaruvathur, Tamil Nadu

docdhana94370@gmail.com

30% of a physician's time will be spent in the use of modern information technology (IT) tools ⁶.

Use of internet is a part of college student's daily routine, integrated into their daily communication habits. Over the last decades, studies have shown that the use of computerised information by medical professionals can improve the quality of care, enhance the use of evidence based medicine and to update knowledge ⁷. For medical students, internet offers a great potential to meet their academic needs, promote learning and also a tool for entertainment and social communication activities.

The various advantages of modern information technology tools can only be materialized in the developing countries if the health care professionals are well versed and adequately trained in basic computing skills. Such training requires a survey to access the baseline proficiency and utilization pattern to identify the areas needing attention ⁸.

The present study aims to determine the patterns of internet use among medical students in an institution in south India in terms of access, frequency and purpose of use and other activities.

MATERIAL AND METHOD

The present cross sectional study was carried out among undergraduate students of Melmaruvathur Adhiparasakthi Institute of Medical Sciences and Research (MAPIMS), Melmaruvathur, Kancheepuram (District) Tamil Nadu, South India, during the period of December 2010. The study population consisted of 285 medical students (1st year and 2nd year MBBS students). No particular sampling method was applied, as only two batch of MBBS students were available for the study.

A self administered, pre-tested semi-structured questionnaire, designed for the study was distributed among the students who were present at the time of administration of questionnaire. The questionnaire elicited information about the socio-demographic profile of students and pattern of internet access, purpose of use and frequency and other related activities.

Prior to administering the questionnaire, the students were addressed regarding the purpose of study and to fill the questionnaire. Informed consent was taken from all participating students. Before the

start of the study, necessary permission from institutional ethical committee was obtained.

The data was analysed by using SPSS v16. Descriptive analyses were performed for various variables. The Chi square test for association was used and $P < 0.05$ was considered as statistically significant.

RESULTS

A total of 285 undergraduate medical students participated in the study. It was observed that the maximum number of students, 146 (51.2%) were in the 18-19 year age group and the mean age was 17.94 years. Majority of the students were female, 148 (51.9%) and studying in first year MBBS 146 (51.2%). In the group, 218 (76.49 %) of the students were residents of urban area. The demographic profile of students is presented in Table 1.

Table 1: Demographic profile of students

S. No	Baseline characteristics	Number (n = 285)	Percentage (%)
1.	AGE GROUP (Years)		
	17 – 18	125	43.9
	18 – 19	146	51.2
	> 19	14	4.9
2.	GENDER		
	Male	137	48.1
	Female	148	51.9
3.	YEAR OF STUDY		
	1 st MBBS	146	51.2
	2 nd MBBS	139	48.8
4.	RESIDENCE		
	Urban	218	76.4
	Rural	67	23.5

The pattern of internet access and use of the students are shown in Table 2. It was observed that, overall 242 (84.9%) students had the experience with internet use. Among them, 158 (55.44 %) were using internet regularly and 80(28%) occasionally. The students preferred surfing the internet in library 126 (44.2%), followed by in hostel 76 (26.7%) and home 67 (23.5%). Majority, 143 (50.2%) of the students were using the internet for personal purpose and 86 (30.2%) were using for academic purpose. Google was the most popular search engine, used by 75.8% of the students. It was observed from the study, that majority 249 (87.7%) were using the internet for less than four hours in a week. In the view of the students, 248 (87.0%) felt that ICT tools would be useful for academic and learning purposes.

Table 2: Pattern of Internet access and use

S. No.	Pattern of internet use	No	Percentage (%)
1.	Experience with internet use		
	Yes	242	84.9
	No	43	15.0
2.	Frequency of internet use		
	Frequently	30	10.5
	Regularly	158	55.4
	Occasionally	80	28.0
	Rarely	17	5.9
3.	Place of internet use		
	Library	126	44.2
	Home	67	23.5
	Hostel	76	26.7
	Internet cafe	16	5.6
4.	Purpose of internet use		
	Personal	143	50.2
	Academic	86	30.2
	Both	56	19.6
5.	Search engines used		
	Google	216	75.8
	Yahoo	48	16.8
	Others	21	7.4
6.	Time spent for internet activity/week		
	< 4 hrs	249	87.3
	4 – 8 hrs	27	9.4
	> 8 hrs	9	3.1
7.	ICT tools in education		
	Useful	248	87.0
	Not useful	28	9.8
	Others	9	3.1

The data was analyzed for relationship between pattern of internet use and gender and a statistical significance association was seen with purpose of internet use and area of residence. The relationship between pattern of internet use and gender is shown in table 3.

Table 3: Relationship between pattern of internet use and gender

Pattern of internet use	Male		Female		Total		P value
	n	%	n	%	n	%	
Year of study							
1 st MBBS	77	27.0	69	24.2	146	51.2	0.10
2 nd MBBS	60	21.0	79	27.7	139	48.8	
Residence							
Urban	114	40.0	104	36.4	218	76.4	0.01*
Rural	23	8.0	44	15.4	67	23.5	
Experience with internet use							
Yes	117	41.1	125	43.8	242	84.9	0.82
No	20	7.0	23	8.0	43	15.0	
Frequency of internet use							
Frequently	15	5.2	15	5.2	30	10.5	0.33

Table 3: Relationship between pattern of internet use and gender

Pattern of internet use	Male		Female		Total		P value
	n	%	n	%	n	%	
Regularly	81	28.4	77	27.0	158	55.4	
Occasionally	36	12.6	44	15.4	80	28.0	
Rarely	5	1.7	12	4.2	17	5.9	
Place of internet use							
Library	61	21.4	65	22.8	126	44.2	0.88
Home	32	11.2	35	12.2	67	23.4	
Hostel	34	11.9	42	14.7	76	26.7	
Internet cafe	10	3.5	6	2.1	16	5.6	
Purpose of internet use							
Personal	84	29.4	59	20.7	143	50.1	0.01*
Academic	45	15.7	41	14.3	86	30.1	
Both	14	4.9	42	14.7	56	19.6	
Search engines used							
Google	98	34.3	118	41.4	216	75.7	0.09
Yahoo	30	10.5	18	6.32	48	16.8	
Others	9	3.16	12	4.21	21	7.37	
Time spent for internet activity/week							
< 4 hrs	118	41.4	131	45.9	249	87.3	0.52
4 – 8 hrs	13	4.5	14	4.9	27	9.4	
> 8 hrs	6	2.1	3	1.0	9	3.1	
ICT tools in education							
Useful	124	43.5	124	43.5	248	87.0	0.19
Not useful	9	3.1	19	6.6	28	9.8	
Others	4	1.4	5	1.7	9	3.1	

* Significance at 5% level

DISCUSSION

In the present study, we assessed the pattern of internet use among undergraduate medical students of Melmaruvathur Adhiparasakthi Institute of Medical Sciences, Melmaruvathur, India. The results of the study show that, 84.9% of the students had experience with internet use. A good number of studies have assessed the use of internet among medical students and our results are comparable to studies done in our country⁷ and from other countries including Germany, Denmark, Finland, Pakistan, Nigeria, Malaysia, Turkey, Tanzania, Saudi Arabia, United Kingdom^{8,9-18}.

Regarding the frequency of use, majority were using frequently and the time spent for internet activity is less than 4 hours in a week. The frequency of internet use is lower as compared to those from other countries.^{9,10,11} Reasons for this might be due to more time spent for their academic learning activities, lack of training and some problems in utilization of internet at institution.

Majority of the students were using internet facilities available at library and home and rely less

on internet cafes, while some studies had reported of higher percentage of students using facilities at café and a lower percentage at library.²⁰ This difference may be due to the availability of internet resources and provision of necessary facilities to the students by private medical institutions.

In the study, majority of students used internet for personal purposes like entertainment and social networking activities. As the year progress, the use of internet for academic activities also increase. The association between gender and purpose of use was found to be statistically significant at $P < 0.05$. Gender disparity in the use of internet resources has been reported in various studies.^{8,9,15,18}

A large majority (87%) of the medical students felt that, use of information communication technology (ICT) tools would be useful in learning and other academic activities and should be encouraged in teaching institutions. Computer assisted teaching and other ICT tools has been gaining importance in the medical field as students can illustrate various procedures, demonstrations, surgeries and also for e-learning purposes.⁷

CONCLUSION

The use of the internet has rapidly been expanding in many parts of the world. To conclude, majority of the students had experience with internet use, but the frequency, purpose and pattern of use is variable, with less realization of internet as a learning tool in their education when compared to other countries. The students should be made aware of the importance of the information communication technology in medical education and should have the necessary skills to utilize online resources totally to improve their learning and quality of patient care. For this, more internet and other facilities should be available and accessible in medical institutions and should equip the students with adequate skills in the use of these resources, as a key component in the education and training.

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A Study of Thyroid Function Tests in Pregnant and Non - Pregnant Women in the Reproductive Age Group of the Garhwal Region of Uttarakhand - India

J B Gogoi¹, Amit K Singh², Sukesh Mukherjee³

¹Associate Professor Cum HOD, Dept of Biochemistry, ²Assistant Professor, Dept of Community Medicine, ³Assistant Professor, Dept of Biochemistry, VCSG Govt Medical Science & Research Institute, Srikot, Srinagar (Pauri), Uttarakhand, India

ABSTRACT

Background: Pregnancy is associated with significant but reversible changes in thyroid function tests which are among the most profound to be seen as a result of a normal physiologic state. As regards with thyroid hormone levels, the pregnancy is a state of thyroid hyper-stimulation, leading to increase thyroid hormone levels. The common thyroid diseases during pregnancy are hypothyroidism, hyperthyroidism and postpartum thyroiditis. Our study was to elucidate the role of these hormones during pregnancy in Garhwal region, India.

Materials & Method: The thyroid function tests were carried out by measuring serum levels of thyroid stimulating hormone (TSH), free thyroxine (FT4) and free triiodothyronine (FT3) by ELISA technique in randomly selected 50 pregnant women and 50 non-pregnant healthy women in the age group of 15 - 45 years to find out the alteration in thyroid function tests. Results were calculated by using student's t-test and 0.05 level of significance.

Conclusion: It is found that the mean FT4 and TSH values are significantly decreased (<0.05 in both cases) and FT3 level increased (>0.05) during pregnancy as compare to the non- pregnant women.

Keywords: Pregnancy, Free Thyroxine (FT4), Free Triiodothyronine (FT3), Thyroid Stimulating Hormone (TSH), Thyroid Function Test

INTRODUCTION

Thyroid disease is relatively common in women of reproductive age group and therefore commonly seen in pregnancy. Pregnancy is associated with significant but reversible change in thyroid function tests which are among the most profound phenomenon seen as a result of a normal physiologic state. Disorders of thyroid hormone production and their treatment can affect fertility, maternal well being, fetal growth and development. Fetal and neonatal thyroid disease may occur as a consequence of maternal thyroid dysfunction or independently, but in both cases the diagnosis and management can be challenging. As regards with thyroid hormone levels in pregnancy – the pregnancy is a state of thyroid hyper-stimulation, therefore of changes of thyroid hormone values. Pregnancy has an effect on thyroid economy with significant changes in iodine metabolism, serum thyroid binding proteins and the development of maternal goiter especially in iodine deficient areas.¹ Common Thyroid diseases during pregnancy are

hypothyroidism, hyperthyroidism and postpartum thyroiditis.

Hypothyroidism was reported to occur in 0.05% of pregnancies²; however, population-screening studies have suggested a higher incidence rate^{3, 4}. The urge to determine the true incidence of hypothyroidism in pregnancy is driven by the knowledge that these women have increased rates of miscarriage, pre-eclampsia, placental abortion, growth restriction, prematurity and stillbirths and their fetuses are at risk for impaired neurological development. Hypothyroidism, if not treated, will progress to myxedema and myxedema coma. The most common cause of hypothyroidism is iodine deficiency. One to 1.5 billion people are at risk; 500 million live in areas of overt iodine deficiency^{5, 6}

The incidence of thyrotoxicosis in pregnancy is 0.05-0.2%, with over 90% due to Graves' disease^{7, 8, 9, 10}. Pregnant women can tolerate mild thyrotoxicosis quite well.

Biochemical evidence of postpartum thyroid dysfunction has a world-wide prevalence of about 5%, usually developing 1-8 months postpartum. There is wide geographical variation in prevalence rates. Women with a family history of autoimmune hypothyroidism are also at increased risk of this condition^{11, 12}.

Keeping in view of several findings by other researchers we had designed our study to find out the variations of these hormones during pregnancy in hilly zone of Garhwal region, India.

MATERIALS AND METHOD

A hospital based case control study designed with 50 randomly selected normal pregnant women and 50 randomly selected non pregnant healthy female as controls in the age group of 15 – 45 years to find out the alterations in thyroid function tests at HNB Base Hospital, Srinagar, Garhwal. All others who had diabetes, collagen disease, heart disease with pregnancy and thyroid problems were excluded from the study. The patients taking known drugs known to cause alteration in thyroid function test were also excluded from this study. Thyroid function tests were carried out by measuring serum levels of thyroid stimulating hormone (TSH), free thyroxine (FT₄) and free triiodothyronine (FT₃) by ELISA technique using ELISA kits manufactured by Lilac Chemicals (USA).

FINDINGS

Statistical analyses were performed by using SPSS software. Results were calculated by using student's t-test and 0.05 level of significance. The findings are represented in Table 1 and Table 2.

Table 1: Mean and SD of FT₃, FT₄ and TSH for Group A and Group B subjects

Variables	Group A (Pregnant) Mean + SD	Group B (Non-pregnant) Mean + SD
FT ₃	2.09 + 0.87	2.04 + 0.56
FT ₄	0.95 + 0.28	1.14 + 0.24
TSH	2.53 + 1.34	2.82 + 1.56

Table 2: Mean values for FT₃, FT₄ and TSH between Group A and Group B

Variables	Group A Vs Group B	
	t value	P value
FT ₃	0.369	P > 0.05
FT ₄	-3.551	P < 0.05
TSH	-0.993	P < 0.05

(P < 0.05 Significant; P > 0.05 à Not-significant)

DISCUSSION & CONCLUSION

Pregnancy is associated with significant but reversible changes in thyroid function studies, which are among the most profound seen as a result of a normal physiological state. In our present study we found that the mean values for all the parameters studied by us were within the normal range during pregnancy. When compared these values with non-pregnant group a significant change has been noticed. It is found that the FT₄ and TSH values decreased significantly (p<0.05 in both cases) and FT₃ level increased (p>0.05) during pregnancy compared to non pregnant women.

In a prospective study FT₃ and FT₄ values were declining while TSH did not show significant difference in pregnant women compared with non pregnant women.¹³ In contrast to this we found that the mean FT₃ level increased in pregnant women in comparison to the non pregnant women. On the other hand, FT₄ and TSH values are significantly decreased during pregnancy as compared to the non pregnant women. Panesar et al, 2001 found that FT₃ decreased during pregnancy whereas FT₄ initially increased.¹⁴ In contrast to their findings, FT₃ values are found to be increased in pregnancy in present study whereas the values of FT₄ are significantly decreased during pregnancy along with the significant decrease of TSH value. Mc Elduff found that FT₄ decreases during pregnancy compared to non pregnant women.¹⁵ In resemblance to this we also found that the values of FT₄ as well as TSH are decreased significantly in pregnant women in comparison to non pregnant women. Erem C et al. found that FT₃ and FT₄ increased during pregnancy and also showed that serum TSH levels declines in pregnant women without goiter compared with non pregnant women without goiter.¹⁶ In contrast to this we found that FT₃ increases in pregnancy compared to non pregnancy state and FT₄ and TSH values are significantly decreased in healthy pregnant group than the non-pregnant group. Kabjemela et. al. found that pregnancy was accompanied by significantly increased levels of total T₃, T₄; decrease FT₄ and increase TSH concentrations in serum.¹⁷ In our study we found that FT₄ decreases significantly in pregnancy which is similar to their study. But in contrast to their study we found that TSH

level is decreased in pregnant women in comparison to the non pregnant women. Melahat Donmez et al. found lower FT_3 , FT_4 and higher TSH in the spontaneous abortus group which is an indication of the presence of a hypothyroidic situation in this group.¹⁸ Abound Elton et al found that TSH values in all the pregnant women were within the reference range and FT_4 level of goiterous pregnant group is significantly lower than the non pregnant control group.¹⁹ In our present study we also found a significantly decreased value of FT_4 and TSH in pregnant group than the non pregnant group.

In another study it was found that hCG has a thyroid-stimulating hormone (TSH)-like activity secondary to specificity crossover at the TSH receptor (TSHR). As a result serum thyroxine (T_4) and triiodothyronine (T_3) levels are elevated, whereas serum TSH levels are reduced during pregnancy which is in support of our results²⁰.

The study shows that there is significant changes occur in thyroid profile during pregnancy in comparison to the non-pregnant healthy women of reproductive age group. These changes mean that adjusted normal reference ranges for thyroid function tests, unique to pregnancy, must be consulted.

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Conflict of Interest

We are reporting this type of study for the first time from the Garhwal region, India; situated at the foothills of the Himalayas. The study can be further extended to include a larger group of population to establish the exact status of thyroid function and find out the cut off range in pregnant women in this region which could be a handy tool for the physicians in diagnosis, treatment and monitoring of the patients and to decrease morbidity and mortality related to thyroid diseases during pregnancy.

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Prevalence of Gingival Recession and its Associated Etiologic Factors: A Cross- Sectional Study

Jyoti A Khade¹, Mangesh Phadnaik²

¹Associate Professor, Dept. of Dentistry, Rajiv Gandhi Institute of Medical Sciences (RIMS) Adilabad. Govt. of A P,

²Associate Professor, Dept. of Periodontology, Govt. Dental College and Hospital, Nagpur, M.S

ABSTRACT

Background: Gingival recession, sometimes called root exposure, is a rather common clinical finding in adults. During recent years, a growing concern about an increase in gingival recession has been expressed by a number of dental clinicians all over the world. Studies on the incidence, prevalence, etiology and treatment of gingival recession have been published by various authors from different countries. However, representative information about the occurrence and risk factors of gingival recession in Indian population is limited.

Objective: To determine prevalence, extent, severity and associated etiological factors of gingival recession in a sample of dental patients.

Materials and Method: 511 subjects of either sex, aged 15 years and above were selected randomly and examined. Demographic data, dental complaints, deleterious oral habits, oral hygiene habits and detailed intraoral examination was done. Prevalence of gingival recession, its correlation to demographic data and etiological factors were examined.

Results: The prevalence of gingival recession in the present study was 89.04%. Prevalence increased with increasing age. Tooth powders, tobacco and ash as dentifrice, deleterious habits like smokeless tobacco, pan and/or betelnut chewing, frenum pull, poor oral hygiene and periodontitis contributed significantly in increasing the prevalence of gingival recession.

Conclusion: A high prevalence of gingival recession exists in dental patients in India. Etiology of gingival recession appears to be multifactorial.

Keywords: *Gingival Recession, Prevalence, Etiological factors*

INTRODUCTION

Gingival recession, often a source of anxiety to patients and perplexity to those treating them, is an intriguing and complex phenomenon.¹ It leads to exposure of the roots of teeth due to apical shifting of gingival margin.² It can cause pain and increased sensitivity of teeth, compromised esthetics and may even lead to loss of vitality of teeth. Furthermore, it is an important risk factor for the development of root

caries.² Gingival recession often results as a consequence of serious anatomical, pathological and traumatic factors. Worldwide studies on gingival recession show a great variety of prevalence values. Most of the studies have not paid any attention to factors related to the occurrence of recession.

Thus, a hospital based cross-sectional study was conducted to determine the prevalence, extent, severity and associated etiological factors of gingival recession.

MATERIALS & METHOD

A cross-sectional study was carried out in dental patients at Govt. Dental College and Hospital, Aurangabad. A total of 511 subjects of either sex, aged 15 years and above were randomly selected and examined after receiving informed consent. Data was collected on age, gender, socio-economic status, dental

Corresponding author:

Jyoti Khade

Associate Professor & HOD

Department of Dentistry

Rajiv Gandhi Institute of Medical Sciences (RIMS)
Adilabad. Govt. of A. P.

Mobile: 9177140755,

Email: wjyots@yahoo.com

complaints, deleterious oral habits and oral hygiene habits. A detailed intraoral clinical examination was done to determine oral hygiene status, periodontal health and gingival recession in mm. Simplified Oral Hygiene Index (OHI-S), Plaque index and Russell's Periodontal index were used to determine oral hygiene status and periodontal health. Statistical significance was tested using Pearson's Chi-square test and Fisher's exact test.

RESULTS

A total of 511 subjects of either sex or age 15 years and above were included in the study. A total of 285 (55.77%) males and 226(44.23%) females were examined. The subjects were divided in to six age groups 15-24, 25-34, 35-44, 45-54, 55-64 and > 64. Out of 511 subjects, a total of 455(89.04%) subjects had atleast one tooth with gingival recession of 1mm or more. Hence, the prevalence of gingival recession was 89.04% in the present study. Extent was calculated by gingival recession in number of teeth per person and severity was calculated by mean vertical recession measurement .51.68% of teeth per person had gingival recession and mean vertical recession measurement was 1.54mm.

The prevalence of gingival recession increased with increasing age which was statistically significant (Table 1).

Table 1. Age-Wise distribution of gingival recession

Age Group	Recession		No Recession		Total
	Number	%	Number	%	
15-24	139	78.09	39	21.91	178
25-34	148	91.36	14	8.64	162
35-44	90	98.9	1	1.1	91
45-54	46	95.83	2	4.17	48
55-64	27	100	0	0	27
>64	5	100	0	0	5

$$\chi^2=31.61, df=2, p=0.0001$$

Females had slightly more prevalence of gingival recession (89.82%) as compared to males (88.42%) but this difference was not statistically significant.

Prevalence of gingival recession in all types of occupation groups was high and nearly similar. This was statistically significant .Income and education was not significantly related to gingival recession. Tooth brush type, teeth cleaning frequency and teeth cleaning direction were not significantly related to gingival recession. But the type of dentifrice was significantly related to gingival recession with high prevalence in

tooth powder users (95.83%) and others (100%) as compared to tooth paste (86.86%) users .Patients using different forms of tobacco or ash powder had highest prevalence of recession.

Deleterious habits were significantly related to gingival recession with high prevalence of gingival recession in patients with deleterious habits (94.44%) as compared to those with no habits (86.19%). But the comparison between prevalence of gingival recession among the different deleterious habit groups was not statistically significant.

Subjects having tooth abrasion had higher prevalence of gingival recession (97.38%) as compared to subjects without abrasion (72.02%).

Frenum pull or abnormal frenum attachment was significantly associated with gingival recession. All subjects with high frenum attachment had gingival recession in the present study.

The prevalence of gingival recession increased with increase in OHI-S score and CI-S score, which was statistically significant ($p=0.0001$). Thus, poor oral hygiene and increase in amount of calculus contributed significantly to development and progression of gingival recession (Table 2).

Table 2 Oral Hygiene Index – Simplified and gingival recession

Age Group	Recession		No Recession		Total
	Number	%	Number	%	
0-1.2	22	70.97	9	29.03	31
1.3-3	309	87.54	44	12.46	353
3.1-6	124	97.64	3	2.36	127

$$\chi^2=20.81, df=2, p=0.0001$$

Increase in Plaque index score showed a statistically significant increase in prevalence of gingival recession (Table 3).

Table 3 Plaque Index and gingival recession

PII	Recession		No Recession		Total
	Number	%	Number	%	
0-0.6	27	61.36	17	38.64	44
0.7-1.8	411	91.33	39	8.67	450
1.9-3	17	100	0	0	17

$$\chi^2=39.05, df=2, p=0.0001, \text{Fisher's exact}= 0.0001$$

The subjects were divided into 3 groups based on their Russell's Periodontal Index score i.e, Healthy (PI=0), Gingivitis (PI=0. 1-1) and Periodontitis (PI=1.1-8). As the subjects involved in the present study were

dental patients, there was no subject in the Healthy group. The prevalence of gingival recession was higher in Periodontitis group than the Gingivitis group (Table 4), which was statistically significant ($P=0.003$). Gingival recession was measured in mm on facial and lingual/palatal surfaces of all teeth excluding 3rd molars in each patient. Maximum number of teeth surfaces in all age groups showed gingival recession less than 3mm (Table 5).

Table 4 Russell's Periodontal Index and gingival recession

PI Score	Recession		No Recession		Total
	Number	%	Number	%	
0 Healthy	0	0	0	0	0
0.1-1 Gingivitis	13	68.42	6	31.58	19
1.1-8 Periodontitis	442	89.83	50	10.17	492

$$\chi^2=8.56, df=1, p=0.003, \text{Fisher's exact}= 0.012$$

Table 5 Gingival recession in number of teeth surfaces

Age Group	<3mm	%	3-4mm	%	>4mm	%	Total
15-24	1733	94.95	74	4.05	18	0.98	1825
25-34	3024	91.85	223	6.77	45	1.36	3292
35-44	2533	89.75	258	9.14	31	1.09	2822
45-54	1431	83.48	255	14.87	28	1.63	1714
55-64	971	81.59	199	16.72	20	1.68	1190
>64	152	73.78	52	25.24	2	0.97	206

$$\chi^2=456.4, df=1, p=0.000001$$

Gingival recession was more prevalent on facial surfaces than lingual/palatal surfaces. Mandibular teeth had higher prevalence of gingival recession as compared to maxillary teeth. Left side teeth were slightly more affected than right side. Incisors (63.34%) showed the highest prevalence of gingival recession followed by premolars (62.89%) and molars (47.18%), whereas canines were the least affected (41.06%).

DISCUSSION

In the present study the prevalence of gingival recession was 89.04%. 51.60% of teeth per person had gingival recession with a mean vertical measurement of recession of about 1.54mm. These results show that gingival recession was highly prevalent in this sample of subjects. A detailed review of literature on prevalence of gingival recession shows a great variety in prevalence values. The prevalence varies from 5% in children to 100% above the age of 50 years. Results comparable to the present study have been reported by many authors.^{3, 4, 5}

The percentage of subjects with gingival recession increased with increasing age in the present study. Similar pattern of age related changes have been presented in many previous studies.^{3,4,6,7} Even though these findings suggest that recession may be a consequence of physiological effect of aging process, one must consider the possibility that, older the one is, the longer he or she could have been exposed to factors influencing recession, and the greater their outcome can be.

There was a slight difference in the prevalence of gingival recession between males and females (males- 88.42% and females -89.82%). But this difference was not statistically significant. Similar results have been reported by few authors.⁴ Most of the studies showed a high prevalence of recession in males.^{2,4,7} The authors attributed this high prevalence in males to more forceful brushing, higher calculus scores, high prevalence and severity of periodontal disease, poor oral hygiene, more adverse habits and less frequent dental visits. In the present study, a slightly higher prevalence of gingival recession in females can be attributed to more frequent brushing due to sensitivity towards illness and aesthetic concerns.

Prevalence of gingival recession was high in all occupation groups, income groups and education groups. But it was statistically significant only for occupation groups. These observations can be explained by the fact that the underlying causes and risk factors are different for different groups of subjects. In subjects with lower socio economic status poor oral hygiene, high calculus scores and periodontal diseases were highly prevalent. Whereas in higher socio economic groups, mechanical factors of tooth brushing like hard toothbrush use, more than twice teeth cleaning frequency and horizontal tooth brushing technique was more commonly seen. Thus, it can be concluded that there could be at least two basic types of recession; one related to mechanical factors of tooth brushing and the other related to periodontal disease and its associated factors. Comparable results have been reported by other few authors.^{3, 8}

In the present study, gingival recession was more prevalent in finger users than toothbrush users which were statistically significant. This can be related to the use of dentifrice with high amount of abrasives in finger user group. More than twice daily teeth cleaning frequency was associated with high prevalence of gingival recession as compared to once or twice daily cleaning frequency. Also, horizontal and rotatory direction of teeth cleaning was associated with high prevalence of gingival recession as compared to vertical direction. The type of dentifrice used had a statistically significant relation to the prevalence of gingival recession. There was 100% prevalence in the group who used agents other than commercially available toothpastes or toothpowders (like ash powder, mishri, tobacco powder etc). Powder group had a higher prevalence than paste group. These results are comparable to many previous cross sectional studies. It has been found that vigorous and forceful tooth brushing^{9,10}, use of hand and/or sharp bristled tooth brush¹⁰, high brushing frequency^{4,10}, horizontal direction¹⁰, wrong technique of brushing^{10,11} and abrasive powder use¹² are most dangerous to gingival health and contribute to gingival recession.

In the present study a statistically significant relation was found between deleterious habits and gingival recession. These results are comparable with other studies.⁸

The association of frenum pull with gingival recession was statistically significant in the present study with 100% prevalence. These observations are similar to other studies.^{7,13} in the present study; poor oral hygiene status as determined by OHI-S and CI-S, had statistically significant relationship to the prevalence of gingival recession. Similar results have been presented by many authors.^{3,7,8}

An increasing trend in percentage of subjects with gingival recession was seen in the present study with increase in plaque index scores. This has been demonstrated in previous studies.⁷

Gingival recession was more prevalent in periodontitis patients as compared to gingivitis group and this difference was statistically significant in the present study. This can be attributed to loss of attachment and bone resorption as a result of localized inflammatory process seen in periodontal disease. Similar results have been reported in other studies.^{1,3,9}

Gingival recession in the present study was quantified as the vertical measurement of recession in mm from cemento-enamel junction to the free gingival margin. Less than 3mm recession was more common in all age groups than the recession of ≥ 3 mm. Comparable results have been demonstrated in most of the previous studies.^{2,3,8} Incisors were the most commonly involved teeth and canines were the least affected teeth in the present study. No consensus is observed in the literature as regards the teeth most frequently affected by gingival recession. Facial surfaces had more prevalence of gingival recession as compared to lingual / palatal surfaces. In agreement with the present study, the literature is unanimous to indicate the buccal or facial surface as the most frequently affected by gingival recession.⁴ Mandibular teeth were more involved than the maxillary teeth in the present study. This can be related to a wider and probably thicker keratinized mucosa in the maxilla than in the mandible. Areas with deficient and thinner keratinized mucosa have been demonstrated to be more susceptible to gingival recession.⁵ Left side of both the arches was slightly more affected with gingival recession than the right side. This could be because most of the patients examined might be right handed and it has been demonstrated in many previous studies that left side of both the arches are more affected with gingival recession in the right handed people.

CONCLUSION

The observations of the present study stress that a very high prevalence of gingival recession exists in dental patients. Gingival recession appears to be multifactorial, with many predisposing and predictive factors playing an important role in the development of gingival recession. Constant motivation and education of the patients is required for the prevention of gingival recession occurrence in the general population.

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Glycemic Control and Pulmonary Function Tests in Type 2 Diabetes Mellitus Patients: Do They Correlate?

Kanya Kumari¹, Nataraj S M², Devaraj H S³

¹Assistant Professor, Dept. of Physiology, ²Professor & Head, Dept. of Physiology, ³Professor, Dept of Medicine, J.S.S. Medical College, Mysore, Karnataka

ABSTRACT

Diabetes is a multisystem disorder accompanied by widespread biochemical, morphological and functional abnormalities which may precipitate certain complications that affect the renal, cardiovascular, neural system, liver, skin and tissues like collagen and elastic fibers. This study was undertaken to find out the correlation between glycemic control and pulmonary function tests (PFT).

Study group consists of 90 patients who were age, sex, height and weight matched. PFT were measured by Medspiror. Fasting blood sugar (FBS), Postprandial blood sugar (PPBS), Glycosylated haemoglobin (HbA1C) levels were recorded. The data was statistically analysed. It showed that with the worsening of glycemic control there was decrease across all the PFT parameters.

Normal lung mechanisms and gas exchange are influenced by integrity of pulmonary connective tissue and microvasculature. Hyperglycemia causes glycosylation of lung collagen and hence less compliant lung parenchyma leading to restrictive lung changes.

Keywords: Glycemic control, Pulmonary Function Tests, Glycosylation, Restrictive Lung pathology

INTRODUCTION

Diabetes mellitus is a metabolic disorder characterized by hyperglycemia resulting from defects in insulin secretion, action or both. Based on etiopathogenic categories, it is classified as Type 1 and Type 2 diabetes mellitus. In Type 1 there is absolute deficiency of insulin secretion. In Type 2 there is a combination of resistance to insulin action and inadequate compensatory insulin secretory response. Diabetes mellitus is accompanied by wide spread biochemical, morphological and functional abnormalities which may precipitate certain complications that affect the neural, cardiovascular, renal systems and also organs and tissues like skin, liver, collagen and elastic fibers. Thus diabetes is a multi system disorder that affects many organs of the body.¹

Prevalence of diabetes is increasing in several parts of the world, especially in developing countries like India. Recent epidemiological data showed that prevalence of diabetes in India is 8-10%.² It has been estimated that 2.4 % of rural population and 8.4% urban population is affected by diabetes already.³

Western interference has lead to loss of physical activity and changes in food pattern from traditional unprocessed natural ingredients to highly refined energy dense fatty and sugary fast foods. These two core factors will be responsible for the high incidence of diabetes in the years to come.

This metabolic disorder is a risk factor precipitating micro vascular pathologies leading to autonomic neuropathy, nephropathy, retinopathy. and macrovascular pathologies leading to coronary artery diseases, cerebrovascular accidents and peripheral vascular diseases.

The microvascular complications appear early, within 5 to 10 years and macro vascular complications appear within 15 to 20 years from the onset of diabetes.⁴

Corresponding author:

Kanya Kumari

C# 2, B M C Doctors Quarters,
J M I T Campus, Nh- 4 Bypass,
Chitradurga-577502. Karnataka
Phone number;9448247634

There are histopathological changes seen in lungs of diabetics such as thickened alveolar epithelial and pulmonary capillary basal lamina leading to reduced pulmonary elastic recoil and lung volumes. There is impaired diffusion due to reduced pulmonary capillary blood volume and thickening of the basement membrane. Non – enzymatic glycosylation induced alteration of lung connective tissue is the most likely mechanism underlying the mechanical pulmonary dysfunction in diabetic subjects. This suggests that lung should also be considered as target organ.⁵

Although a lot of research work is being carried out on the after effects of diabetes mellitus on pulmonary parameters world wide, the literature pertaining to this is not in abundance in India. Therefore this study was undertaken to find out the effects of diabetes mellitus on pulmonary function tests in patients who attend or admitted to medical OPD or ward of J.S.S Medical College Hospital, Mysore.

MATERIALS AND METHOD

Ninety diabetic patients previously diagnosed, belonging to either sex attending / admitting to OPD / ward at J.S.S.M.C Hospital, Mysore, were studied.

Inclusion criteria: Previously diagnosed diabetic patients, non- smokers, with no previous H/o any respiratory diseases and clinically ruled out cardiovascular diseases.

Exclusion criteria: Smokers, non-diabetics, patients with previous/ present cardio-respiratory diseases.

Pulmonary functions were carried out using the instrument medspiror (a computerized spirometer self calibrating, which fulfill the criteria for standardized lung function tests)

METHODOLOGY

Diabetic patients were selected carefully using criteria laid down. Their written consent was taken. The history was elicited. Age, height, weight were recorded. Each subject was instructed to visit laboratory with 6 hours of fasting on a specific date, the blood samples (3 ml volume) was drawn for estimation FBS and glycated hemoglobin.

Thorough clinical examination was carried out. The performance of the pulmonary function tests was demonstrated. Patients were made to undergo pulmonary function tests using medspiror, for 3 times at every 15 minutes interval and best of 3 was taken into account.

The FVC, FEV₁, PEF, FEV₁/ FVC, FEF_{25-75%} were recorded. The subject was asked to take breakfast and blood sample drawn 2 hour later for PPBS estimation. The anthropometric, respiratory, blood glucose parameters and glycated Hb levels were recorded in proforma. Master chart was prepared.

STATISTICS

Following statistical methods were applied in the present study.

1. Cross tabs procedure (Contingency coefficient test).
2. Descriptive statistics.
3. Chi-square test.

OBSERVATIONS AND RESULTS

In the present study following observations were made.

Samples are age, sex, height & weight matched.

Table 1. Spirometric pattern in diabetic patients.

	Normal	Restrictive	Obstructive
Number of patients	8	70	12

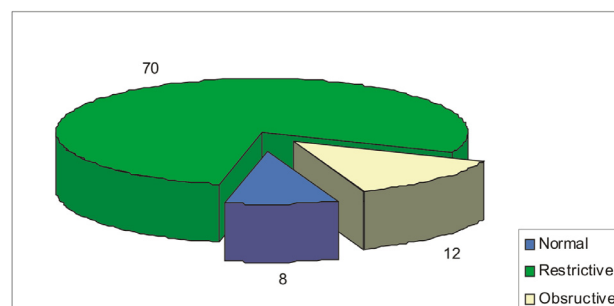


Fig. 1. Graph showing spirometric pattern in diabetic patients.

The number of patients belonging to restrictive and obstructive pattern were 70 and 12 respectively and remaining 8 were normal.

Table 2: Comparison of pulmonary function tests parameters in diabetic patients in relation to different ranges of FBS levels.

FBS(mg%)		FVC (L)	FEV ₁	FEV ₁ /FVC	PEFR(L/sec)	FEF _{25-75%}
< 120	A	2.30 ± 0.56	1.91 ± 0.44	0.83 ± 8.42	4.75 ± 1.58	2.40 ± 0.89
	P	2.44 ± 0.84	1.92 ± 0.40	0.75 ± 0.10	6.55 ± 1.67	2.90 ± 0.76
	P value	0.10 (NS)	0.99 (NS)	0.00 (S)	0.00 (S)	0.00 (S)
121-170	A	1.97 ± 0.45	1.63 ± 0.44	0.80 ± 0.12	4.18 ± 1.91	1.99 ± 0.99
	P	2.35 ± 0.39	1.79 ± 0.35	0.76 ± 4.19	6.43 ± 1.35	2.97 ± 1.32
	P value	0.00 (S)	0.04 (S)	0.04 (S)	0.00 (S)	0.00 (S)
170 +	A	2.31 ± 0.64	1.90 ± 0.53	0.81 ± 0.10	5.32 ± 1.52	2.31 ± 0.87
	P	2.61 ± 0.55	2.05 ± 0.44	0.77 ± 3.14	7.10 ± 1.26	3.04 ± 0.74
	P value	0.00 (S)	0.05 (S)	0.00 (S)	0.00 (S)	0.00 (S)

A= Actual, P = Predicted

Patients were divided into three groups depending upon their FBS levels, upto 120mg%, 121-170 mg% and > 170 mg %. Then the actual and predicted values of PFT's were compared in the individual groups. There were no significant changes in PFT in the first group (i.e., patients with FBS less than 120 mg %).

When the actual and predicted values of the PFT's were compared in the second group (i.e., patients

with FBS between 121-170 mg %) there were significant reductions in all the parameters, with p values of 0.00, 0.04, 0.04, 0.00 and 0.00 respectively.

When the actual and predicted values of the PFT's were compared in the third group (i.e., patients with FBS levels > 171 mg %) there were significant reductions in all the parameters with p values of 0.00, 0.05, 0.00, 0.00 and 0.00 respectively.

Table 3: Comparison of PFT parameters in diabetic patients in relation to different ranges of PPBS levels.

PPBS (mg %)		FVC (L)	FEV ₁	FEV ₁ /FVC	PEFR(L/sec)	FEF _{25-75%}
< 180	A	2.27 ± 0.56	1.83 ± 0.44	0.81 ± 8.3	4.50 ± 1.80	2.11 ± 0.72
	P	2.40 ± 0.44	1.86 ± 0.37	0.74 ± 0.12	6.46 ± 1.75	2.77 ± 0.80
	p value	0.17 (NS)	0.61 (NS)	0.05 (S)	0.00 (S)	0.00 (S)
181-220	A	1.84 ± 0.44	1.51 ± 0.47	0.83 ± 9.96	3.79 ± 2.04	1.80 ± 1.10
	P	2.43 ± 0.39	1.82 ± 0.40	0.77 ± 4.52	6.79 ± 1.09	2.99 ± 0.44
	p value	0.00 (S)	0.14 (NS)	0.06 (S)	0.00 (S)	0.00 (S)
221 +	A	2.19 ± 0.57	1.83 ± 0.49	0.81 ± 0.11	4.90 ± 1.66	2.30 ± 0.97
	P	2.48 ± 0.50	1.93 ± 0.42	0.77 ± 3.69	6.72 ± 1.39	3.03 ± 1.08
	p value	0.00 (S)	0.05 (S)	0.00 (S)	0.00 (S)	0.00 (S)

A= Actual, P = Predicted

Patients were divided into three groups depending upon their PPBS levels as < 180 mg %, 181-220 mg% and > 221 mg %. Then actual and predicted values of PFT's were compared in the individual groups. There were no significant changes in PFT in the first group (i.e., patients with PPBS levels < 180 mg %). There were no significant reductions in FVC and FEV₁ and significant reductions in FEV₁/FVC, PEFR and FEF_{25-75%} (p values 0.05, 0.00 and 0.00).

When the actual and predicted values of the PFT's were compared in the second group (i.e., patients with PPBS levels of 181- 220 mg %) there were significant reductions in FVC, PEFR, FEF_{25-75%} (P values 0.00,0.00 and 0.00).

In the third group (i.e., PPBS levels > 220 mg%) there were significant reductions across all the PFT parameters (p values 0.00, 0.05, 0.00, 0.00 and 0.00).

Table 4: Comparison of PFT parameters in diabetic patients in relation to different ranges of HbA_{1c} levels

HbA _{1c} %		FVC (L)	FEV ₁	FEV ₁ /FVC	PEFR(L/sec)	FEF _{25-75%}
< 7	A	2.60 ± 0.47	2.13 ± 0.49	0.80 ± 8.56	4.53 ± 1.66	2.62 ± 0.68
	P	2.63 ± 0.40	2.05 ± 0.41	0.76 ± 6.86	7.28 ± 0.86	2.80 ± 1.36
	p value	0.83 (NS)	0.50 (NS)	0.06 (S)	0.00 (S)	0.71 (NS)
>7	A	2.14 ± 0.56	1.71 ± 0.48	0.81 ± 0.11	4.70 ± 1.77	2.17 ± 0.95
	P	2.44 ± 0.48	1.89 ± 0.40	0.76 ± 6.63	6.62 ± 1.46	2.98 ± 0.94
	p value	0.00 (S)	0.00 (S)	0.00 (S)	0.00 (S)	0.00 (S)

A= Actual, P = Predicted

In the HbA_{1c} group < 7%, there were no significant reductions in PFT's. In the HbA_{1c} group of > 7%, there were significant reductions in of FVC, FEV₁, FEV₁/FVC, PEFR and FEF_{25-75%} with p value of 0.00, 0.00, 0.00, 0.00 and 0.00

DISCUSSION

Randomized controlled trials have demonstrated that meticulous glycemic control reduces risk of microvascular and neurological complications of diabetes⁶.

DCCT (Diabetes Control and Complications Trial) clearly suggests that normoglycemia is beneficial to delay the pulmonary function derangement⁷.

Complications of DM are related to quality of glycemic control, hence normoglycemia or near glycemia is the goal for treatment of diabetic patient.

In the FBS group I (with the blood sugar range <120mg %), when the PFT's parameters were compared with respective predicted values FEV₁/FVC, PEFR, FEF_{25-75%} showed a significant fall (p<0.01). FVC, FEV₁ showed no significance (p>0.05).

But in the FBS group II (with blood sugar range of 121-170 mg%) there was significant fall in PFT parameters like FEV₁ & FEV₁/FVC (p < 0.05) and FVC, PEFR, FEF_{25-75%} (p < 0.01). Hence a decline was seen for all the parameters of PFT, and there was worsening of respective lung function from group I to group II.

In group III (with FBS > 170mg %), all the PFT parameters showed a significant fall (p < 0.01)

Thus high levels of FBS were associated with worsening of PFT's.

In a study by Robert E. Walter⁸, the relationship of FBS to PFT's found a decrease in FVC with increasing blood glucose (p < 0.05). Similarly FEV₁ values were decreased with increasing FBS levels (p < 0.05)

Likewise the relationship of FBS to FEV₁/FVC showed a significant fall.

According to a study of Davis A Wendy⁹, spirometric measures were decreased >10% and above at baseline and absolute measures continued to decline at an annual rate of 68ml, 71ml, and 17ltr/min for FVC, FEV₁, and PEFR respectively. Declining lung function measures were consistently predicted by poor glycemic control.

In a study by Sheikh GP¹⁰ et.al, relatively lower fasting blood sugar (<130mg%) levels were not associated with any PFT abnormality, where as high FBS levels (>160mg%) were associated with PFT abnormalities across all the parameters.

Hence our present study is in agreement with above authors.

In the PPBS group I (with blood sugar <180mg%), when PFT parameters were compared with respective predicted values FEV₁/FVC, PEFR, FEF_{25-75%} there was significant fall (p<0.05). But for FVC, FEV₁ there was no significant change (p > 0.05).

In the group II (with PPBS level 181-220mg%) there were again significant reductions in all the PFT parameters (p<0.05) except FEV₁ (p > 0.05).

In the group III (with PPBS level > 221mg%) there were significant fall in all the PFT parameters (p < 0.01 and p < 0.05).

In a study by Sheikh GP et.al, it was found that diabetics with lower PPBS level (<180mg %) had no PFT abnormalities. But when PPBS levels were high (>210mg %) the PFT abnormalities were present across all the parameters.

In a study by P Lange¹¹ et.al, (Copenhagen City Heart study), raised plasma glucose concentrations (>200mg%) were associated with significant reductions in lung functions. On an average FVC, FEV₁ were reduced by 334 ml and 239ml respectively.

Hence our study is in agreement with above authors.

Comparison of HbA_{1c} with PFT parameters

When actual and predicted values of FVC, FEV₁, FEV₁/FVC, and FEF_{25-75%} were compared in the group with HbA_{1c} <7%, there were no significant changes in the PFT parameters ($p > 0.05$).

But in the group with HbA_{1c} > 7%, there was a significant fall across all the PFT parameters ($p < 0.01$).

In a study by Sheikh GP et.al., HbA_{1c} levels <7% were not associated with any PFT abnormalities, whereas in patients with HbA_{1c} > 7% abnormal PFT's were present.

In a study by P. Makkar et.al., when the HbA_{1c} levels >7% there were reductions in FVC, FEV₁, FEV₁/FVC, PEFR values ($p < 0.01$).

According to Davis A Wendy, there were decrease in spirometric measures for FVC, FEV₁, PEFR. The decrease in PFT measures were consistently predicted by poor glycemic control in the form of higher HbA_{1c} >7%.

Thus our study is in agreement with the above authors.

Non enzymatically glycosylated collagen seen in diabetic is considerably more resistant to digestion by pepsin & collagenase than non- diabetics. This is the likely explanation for chronic hyperglycemia causing glycosylation of lung collagen and hence less compliant lung parenchyma leading to restrictive changes in lungs.¹²

CONCLUSION

1. Type 2 Diabetes mellitus is associated with restrictive pattern of respiratory abnormality.
2. Poor glycemic control is associated with worsening of pulmonary function parameters.
3. Spirometry remains a cost effective, a simple non-invasive diagnostic tool and its judicious use can give warning signal for patients to take early preventive measures.

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Dental Knowledge and Awareness of Oral Hygiene among Medical Undergraduates at a Tertiary Care Hospital

Jindwani K¹, Singh K², Garg S P³, Garg V⁴

¹Senior Resident, Department of Dentistry, ²Assistant Professor, Department of Medicine, ³Associate Professor Department of Forensic Medicine, ⁴Assistant Professor, Department of Physiology, S.S. Medical College Rewa, Madhya Pradesh

ABSTRACT

An increasing proportion of the population is medically compromised. Dental & medical staff need to communicate and cooperate to render these patients the best possible health care.

Objective: The aim of this survey was to investigate the level of dental knowledge and awareness of oral care habits in undergraduate medical students from three clinical years of the medical curriculum.

Methodology: A cross sectional study was conducted and the data was recorded through a close ended structured and self administered questionnaire consisting of socio demographic data, questions on dental knowledge and awareness of oral hygiene habits in a small group of pre-doctoral students of M.B.B.S at S.S. Medical College, Rewa.

Results: 130 students participated in the survey who returned completed questionnaires after answering, with a high response rate (98.4%). Three-fourths (73%) of the subjects were females. 97% of the undergraduates believed that removal of a tooth causes no ill effects on vision. 90% of the students were rightly aware of the fact that dental caries was the most common oral disease and most of them responded well on questions regarding prevention and treatment of dental caries. 93.8% students considered tooth brushing as the most effective cleaning aid and 73.8% of the participants believed that brushing should be done after every meal. 93.8% subjects recommended 6 monthly dental check ups.

Conclusion: In general, students had a moderate level of dental knowledge and reported good oral hygiene habits. Findings justify the inclusion of oral health in medical curriculum.

Keywords: Oral Hygiene, Brushing, Dental Caries, Awareness, Medical Undergraduates

INTRODUCTION

Oral health is an integral part of general health. It plays an essential role in individual well-being, appearance, social skills, diet, nutrition, speech and self-esteem. All members of the health profession have the potential to promote oral health by supporting oral health messages showing exemplary oral health-related behaviour, encouraging appropriate dental visits and participating in explicit oral health

promoting activities within their scope of duties¹. Many individuals who lack access to the private practice dental delivery system may be forced to use physician offices, hospital emergency department, or other ambulatory care settings for their dental care².

Thus, it is observed that a more equitable, effective and affordable dental care would be enjoyed, especially by the relatively poor developing countries, if basic clinical dentistry was integrated into their existing Primary Health Care systems³. Literature showed that 90% or more of family physicians and paediatricians report in national studies that they conduct dental caries risk assessment in at least some of their patients and 87% or more screen for caries⁴. This important interface between medical and dental practitioners has received only superficial study. Several authors have addressed the role physicians

Corresponding author:

Karuna Jindwani

Senior Resident

Dept. of Dentistry

Shyam Shah Medical College

Rewa(M.P.)

jindwanikaruna@yahoo.co.in

play in addressing oral health problem ^{5,6}. Thus, oral care element needs to be incorporated in the formal undergraduate training curriculum among medical students. Strict implementation of oral health modules within the medical curriculum must be formulated by medical education and health services in all developing countries.

The purpose of this study was to determine the extent of dental health knowledge among medical students of pre-final year, final year group and interns of M.B.B.S at Shyam Shah Medical College, Rewa (M.P.) India. It aimed to investigate their attitudes towards dental health and oral hygiene habits.

SUBJECTS AND METHOD

A cross-sectional questionnaire survey was carried out to assess the knowledge, attitude and awareness of medical students at S.S.M.C Rewa in the month of August and September 2011. Data was collected on a specially structured questionnaire from medical students of three different clinical years of medical curriculum.

A total of 132 complete anonymous, self administered questionnaires were distributed in the survey. Out of them 130 forms were returned complete (response rate = 98.4%). The students were approached personally in the class rooms and at clinical postings and the purpose of the study was explained. It was also mentioned that responses would remain

confidential. They were asked to anonymously fill out the structured questionnaire with 15 closed ended questions which addressed the demographic characteristics of participants, their knowledge, attitude and perceptions concerning dental health and also oral health habits.

A total of 47 students from the pre final (fourth year of medical curriculum) 43 students from final year (fifth year of medical curriculum) and 40 interns (doing internship) returned their forms completed and thus participated in the survey. Rest of the students from their respective batches were not present in the class rooms or clinics on the day survey was conducted. The filled questionnaire were immediately collected after the survey and analysed.

OBSERVATION AND RESULTS

Demographic characteristics of the sample

One hundred and thirty two questionnaires were distributed where by 130 were returned fully complete with the response rate of 98.4% (table no -1). The highest proportion of participants in this study was from the fourth year of medical curriculum i.e. 47 students (36.15%) (table no -1). Almost 73% of the respondents were females, (table no -1) which reflects the gender distribution of the students at S.S.M.C, Rewa. The age of the students from three clinical years of medical curriculum ranged between 21 and 31 years.

Table 1: Characteristic of Study Participants (n=130)

Characteristic						
S.No	Clinical Years	Number of Students n (%)	Response rate n (%)	Gender		Total
				Male n (%)	Female n (%)	
1.	Pre final year (4 th year)	47 (36.1%)	100.00	13(27.6%)	34(72.3%)	47(100.0%)
2.	Final year (5 th year)	43 (33.0%)	95.55	12(27.9%)	31(72.0%)	43(100.0%)
3.	Interns (Internship)	40 (30.7%)	100.00	10(25.0%)	30(75.0%)	40(100.0%)
	Total	130(100.0%)	98.4	35(26.92%)	95(73.0%)	130(100.0%)

Table 2. Response of Study Subjects Based on Their Dental Knowledge (n = 130)

S.No.	Factors	Number answered correctly (%)			
		Pre final year n=47	Final year n=43	Interns n=40	Total n=130
1.	Number of teeth in Temporary and permanent dentition	33(70.2%)	35(81.3%)	29(72.5%)	97(74.6%)
2.	First tooth to erupt in oral cavity	36(76.5%)	31(72.0%)	35(87.5%)	102(78.4%)
3.	Most common disease of oral cavity	40(85.1%)	40(93.0%)	38(95.0%)	118(90.7%)
4.	Prevention of dental decay	37(78.7%)	38(88.3%)	35(87.5%)	110(84.6%)
5.	Treatment of dental decay	35(74.4%)	29(67.4%)	30(75.0%)	94(72.30%)
6.	Dental decay is contagious	22(46.8%)	25(58.1%)	25(62.5%)	72(55.3%)
7.	Removal of tooth causes vision impairment	45(95.7%)	42(97.6%)	39(97.5%)	126(96.9%)
8.	Pregnant woman needs dental check-up	39(82.9%)	40(93.0%)	40(100.0%)	119(91.5%)
9.	Unhealthy gums may precipitate infective endocarditis	38(80.8%)	35(81.3%)	35(87.5%)	108(83.0%)

Table 3. Oral Hygiene Practises (N= 130)

S.No.	Factors	Number answered correctly (%)			
		Pre final (4 th year) (n=47)	Final year (5 th year) (n=43)	Interns (n=40)	Total (n=130)
1.	Most effective measure of cleaning teeth	40(85.10%)	42(97.6%)	40(100.0%)	122(93.8%)
2.	Frequency of tooth brushing advisable	32(68%)	35(81.3%)	29(72.5%)	96(73.8%)
3.	Consistency of bristles on a tooth brush should be	30(63.8%)	29(67.4%)	27(67.5%)	86(66.1%)
4.	Brushing makes teeth sensitive	41(87.2%)	39(90.6%)	37(92.5%)	117(90.0%)
5.	Scaling causes motility in teeths	28(59.5%)	27(62.7%)	25(62.5%)	80(61.5%)
6.	Frequency of dental visits	42(89.3%)	41(95.3%)	39(97.5%)	122(93.8%)

Responses of study subjects based on their dental knowledge

With regard to dental knowledge, majority of the respondents from the intern group answered the questions correctly when compared to their junior counterparts in nearly all the questions related to dental knowledge and awareness of oral hygiene habits (table no -2 and 3).

Among the study sample (n=130), 97 students (74.6%) were aware about the total number of teeth in primary and permanent dentition. Approximately all students from the 3 groups mentioned 32 teeth in the permanent dentition. However, 20 teeth in primary dentition was answered correctly by 33 students (70.21%) from the pre final (4th year), 35 students (81.39%) from the final (5th year) and 29 interns (72.5%).

Lower central incisor is the first primary tooth to erupt in the oral cavity at the age of 6 months +/- 2 months was answered correctly by 102 students (78.4%). 90% Of medical students (118 students) agreed that the most common dental disease for which patients approach a dentist is dental caries. 10(7.6%) students considered gingivitis as the most common oral disease and the rest of the medical students considered periodontitis and others as the answer, which was incorrect.

Most of the medical students i.e.110 students (84.61%) were aware that dental caries can be prevented by decrease in frequency of sugary diet, proper oral hygiene measures and regular dental check ups. 94 students (72.30%) answered correctly that a carious tooth can be treated by the removal of the decayed portion and followed by restoration. 16 students (12.3 %) were incorrect as they considered the answer for treatment of dental carries as capping. However, 14 students (10.7%) considered removal of the tooth as the correct option.

The question which was answered correctly by maximum number of the students i.e. 126 participants (96.9%) was that the removal or extraction of a tooth does not cause vision impairment. Dental caries is not contagious i.e.it does not spread from one tooth to the other was correctly answered by only 72 candidates (55.3%).

Pregnant women do need regular check up, as gingival growths and swellings occur more commonly during the antenatal course, and require symptomatic monitoring , was answered in affirmative correctly by 119 students (91.5%).

Plaque and calculus deposits in gingival pockets are responsible for gum diseases. These unhealthy gums may be the source of septicaemia due to leakage of micro-organisms in blood stream via gingival pockets. Thus, these conditions predispose to infective endocarditis in unprotected patients with diseased cardiac valves. Unhealthy gums may precipitate infective endocarditis was answered as true, correctly by 108 students (83.0%).

Awareness of oral hygiene practices in medical students

With regard to oral care practices (table no -3), majority (93.8%) reported that the most effective measure of cleaning their teeth is by means of a tooth brush. Brushing twice a day was answered by 30 students (23.0%), when were asked about the best advisable frequency of brushing. However, brushing after every meal was the correct option and was chosen by 96 students (73.8%) out of the study sample.

86 students (66.15%) were aware that the bristles of a tooth brush should be ultrasoft in consistency. While 40 medical students (30.76%) considered the 'soft' bristles more appropriate, which was less correct.

Majority of the predoctoral under graduates (90%) agreed that brushing does not increase sensitivity of teeth. 80 medical students (61.57%) from 3 years of medical curriculum answered that scaling or cleaning of teeth has no adverse effect on teeth. However, remaining 50 students (38.4%) answered in affirmative that scaling causes mobility of teeth. Maximum number i.e. 126 participants (93.8%) answered correctly that six monthly dental check ups are a must.

DISCUSSION

According to William Osler, mouth is the mirror of general health⁷. Thus, poor oral conditions adversely affect general health⁸. If non dental health care providers are to play a role in oral health promotion, it is necessary that they demonstrate good knowledge in basic dental science and oral hygiene behaviour. The literature encourages the incorporation of oral health module into the undergraduate training programme to facilitate delivery of quality advises on oral and dental health by non- dentist health care providers⁹. Additional education and guidelines have proven beneficial in assisting physicians in dealing with dental problems. This is a first unique cross sectional study to assess the knowledge of dental health and the practice of oral care habits among pre doctoral students from 3 years of medical curriculum at Shyam Shah Medical College, Rewa (M.P.)

Dental knowledge of medical students

Our results indicate that on a average, medical students from three consecutive clinical years had moderate level of dental knowledge. They scored well in questions on the most common oral disease (90.7%) and modes of prevention (84.61%) and treatment of this disease (72.30%). Approximately 97.0% of the participants were aware that dental extraction has no ill effect on vision and 91% of the students correctly answered that pregnant women do require regular dental check ups. However, majority (44.7%) mistakenly considered dental carries as a contagious disease.

Findings regarding dental knowledge from this study are consistent with that conducted among groups of university students from non- dental backgrounds. However, direct comparison of knowledge level was difficult to ascertain due to different contents of knowledge questions in questionnaires used and students from varying faculties were selected^{4, 7, 8} in different surveys.

Oral care practices in medical students

Majority of the students during the survey cited good oral hygiene habits as 93.8% considered tooth brushing with tooth paste as the most effective measure for cleaning teeth and 90% rightly disagreed that hypersensitivity of teeth occur due to brushing. The importance of tooth brushing was the most common advise given concerning oral health, consistent with other studies¹⁰. In this study, 73.8% of the subjects recommended brushing after every meal which is lower than the Italian population where 92.1% of the subjects recommend brushing their teeth more than once a day¹¹.

In the present study, with regards to attitude, 122 (93.8%) medical students have answered that they would suggest patients to visit the dentist once in every six months. In a study conducted by Jagdish Chandra et al¹² in Mangalore it is seen that regular visit of once in six months was suggested by 86.3% of the participants which is quite low when compared with the attitude of medical students (93.8%) at Rewa. Although six monthly dental check ups are commonly recommended in many countries, there is no scientific evidence to justify this high frequency, which can sometimes lead to unnecessary dental treatment¹³.

Thus, the dental knowledge and awareness of oral hygiene measures was found satisfactory in the undergraduate students of medical college at Rewa. This could be because of the inclusion of a dental posting in their curriculum which enhance their exposure to dental health aspects.

CONCLUSION

The results of this small study revealed that medical students had a moderate level of dental knowledge and good awareness regarding oral hygiene measures. Since, the response rate was good (98.4%), non response bias does not impact the findings of this survey. Thus this study forms a baseline description of dental knowledge and oral health behaviour of medical students in central parts of Madhya Pradesh.

This study provides important information as it includes the key players in health promotion of general population. Thus, this survey justifies the need of collaborative efforts from medical faculty to strengthen the medical curriculum to improve the knowledge, attitude and awareness of medical students about clinical dental science.

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Correlation of C-Reactive Protein with Body Mass Index and Blood Pressure in Young Adult North Indian Hypertensive Males -A Prospective Study

Kiran Singh¹, Anita Pandey², Tanuraj Sirohi³, Rajesh Misra⁴, Rupesh Tewari⁵

¹Professor, Department of Physiology, ²Professor, Department of Microbiology, ³Professor, Department of Medicine, ⁴Professor and Head Department of Physiology, ⁵Lecturer, Department of Biostatistics, Subharti Medical College, Meerut

ABSTRACT

Background & Objectives: High blood pressure has been associated with elevated C-reactive protein (CRP), a possible marker of vascular inflammation. The aim of this study was to assess the inter-relationship between blood pressure and CRP in young adult north Indian males.

Method: A total of 30 patients with mild to moderate essential hypertension in the age group of 25-40 years were enrolled for the study. Patients with history of secondary or malignant hypertension were excluded. Age and sex matched healthy normotensive subjects (n=35) were taken as control. The parameters studied were BMI, Systolic (SBP), diastolic (DBP) blood pressure and CRP. C-reactive protein was measured by RHELAX CRP slide test. Statistical analysis was done by using Karl-Pearson correlation coefficient and Student's unpaired t test.

Results: We have observed significant differences ($P < 0.05$) in BMI, SBP and DBP between the study and control groups. The study reveals a significant correlation ($p < 0.01$) between BMI and blood pressure and a positive non-significant ($p > 0.01$) association between blood pressure and CRP levels in the study group.

Conclusion: Further studies are needed to explore the relationship between blood pressure and CRP using highly sensitive assays as a major screening test in the prediction, diagnosis and management of essential hypertension.

Keywords: BMI, Blood Pressure, C-reactive protein, Young Indian Adults

INTRODUCTION

Hypertension, the commonest cardiovascular disorder, is posing a major public health challenge to population in socio-economic and epidemiological transition¹. Almost 90% of all cases are due to essential hypertension². Various factors might have contributed to this rising trend such as change in life style, diet and stress. Community survey has documented that in India, prevalence of hypertension between third and sixth decade has increased by about 30 and 10 times among urban and the rural inhabitants respectively³.

Basic data suggest that increasing level of blood pressure may stimulate a proinflammatory response and endothelial inflammation may also herald the changes in arterial wall that characterize the hypertensive state^{4,5}. Some investigators hypothesize that C-reactive protein (CRP), one possible marker of inflammation plays a direct role in vessel damage and clinical cardiovascular events^{6,7}. CRP is associated with decreased endothelium-dependent relaxation, a potential risk factor for hypertension^{8,9}. CRP may aid in identifying persons at high risk for a first cardiovascular event who might otherwise be missed by lipid screening alone¹⁰.

Although, there are reports of higher CRP levels in healthy Asian Indians living in United Kingdom and States, when compared with western population^{11,12,13} but not much work has been documented on similar studies in Indian subjects^{14,15}.

Corresponding author:

Kiran Singh,

Department of Physiology, Subharti Medical College,
N H-58 Meerut-250005

E-mail: singhkiran15@yahoo.co.in

Mob: 09410886644

Various studies have shown an association between CRP levels and blood pressure in elderly population^{16, 17, 18} however, limited studies are available in young adults^{19, 20}.

In urban Asian Indians, rapid escalation of cardiovascular risk factors have been reported between the age group of 30-39 years²¹. Therefore, the present study was designed to assess whether circulating levels of CRP are independently related to body mass index (BMI) and blood pressure in young adult north Indian males.

MATERIAL AND METHOD

The study was conducted in the department of physiology in collaboration with medicine and microbiology. Clearance was obtained from the ethical committee of the institute before beginning of the work. Subjects were recruited from the outpatient department of medicine of Chhatrapati Shivaji Subharti Hospital associated with Netaji Subhash Chandra Bose Subharti Medical College, Meerut (U.P.). All participants provided informed written consent.

SUBJECTS

A total of 30 male patients in the age group of 25 - 40 years with mild to moderate hypertension were studied. A detailed history of dizziness, palpitation, easy fatigability, epistaxis, headache, dietary habits, occupation, physical activity, family history of hypertension, coronary heart disease (CHD) and stroke was taken. Age and sex matched healthy normotensive (n=35) subjects were taken as control.

EXCLUSION CRITERIA

Patients who were already on treatment for hypertension or having history of secondary or malignant hypertension, recent clinical infection or surgery, renal, hepatic, or cancerous diseases, major trauma, inflammatory disease, CHD and stroke were excluded from the study. Subjects having history of smoking, alcohol intake, diabetes mellitus and dyslipidemia were excluded from the study as well as control groups.

BRIEF PROCEDURE

Blood pressure was measured by the auscultatory method with mercury sphygmomanometer. The

persons with either systolic blood pressure (SBP) ≥ 140 mm Hg or diastolic blood pressure (DBP) ≥ 90 mm Hg or both were considered to be hypertensive according to JNC VII criteria²². Blood pressure measurement was based on the average of 2 readings on two or more visits after initial screening. BMI was calculated by using Quetlet Index i.e. weight (kg.) / height (m²).

CRP MEASUREMENT

Three ml of venous blood sample was collected from each subject. Serum was separated and used for the estimation of CRP by RHELAX CRP slide test (Tulip Diagnostics Pvt. Ltd.). It is based on the principle of agglutination. Serum is mixed with RHELAX CRP latex reagent and allowed to react. If CRP concentration is ≥ 0.6 mg/dl a visible agglutination is observed. Agglutination is a positive test result. Most healthy subjects have a plasma CRP level of 0.2 mg/dl (2.0mg/L) or less²³.

STATISTICAL ANALYSIS

Student's unpaired t test was used to find the differences between the study group and control groups. Karl- Pearson correlation coefficient (r) and 't' test was applied to test the significant association between the variables with n-2 degree of freedom at 1% level of significance.

RESULTS

Table 1 shows the baseline characteristics of the subjects in the study and control groups. All the values are expressed as mean \pm SD. We have observed significant differences ($P < 0.05$) in BMI, SBP and DBP between the study and control groups. Table 2 shows the result of correlation between blood pressure and CRP in both groups. A strong positive association was found between SBP, DBP and CRP in the study group. While, on applying 't' test, no significant correlation ($p > 0.01$) was found at 1% level of significance. In the control group, a positive non-significant correlation ($p > 0.01$) of CRP was observed with blood pressure.

Table 3 shows that no significant correlation ($p > 0.01$) was observed between BMI and CRP in the study and control groups. However, BMI was significantly associated ($p < 0.01$) with SBP and DBP in the study group, while in the control group it was found to be statistically insignificant ($p > 0.01$).

Table 1: Baseline characteristics and CRP levels in the study and control groups

Parameter	Study group (n=30)	Control group (n=35)
Age (years)	36.47±4.14	32.25±3.92
BMI (kg/(m ²).	25.57±2.80*	22.50±2.4
Pulse Rate (per minute)	83.36±6.1	82.0±5.13
SBP (mmHg)	142.07±9.76*	113.54±7.82
DBP (mmHg)	92.36±4.15*	74.74±6.41
CRP (mg/ dl)	1.04±0.54	0.95±0.51

All values are expressed as mean ± SD. *P<0.05 Statically Significant

Table 2: Correlation of CRP (mg/dl) with blood pressure (mmHg) in the study and control groups

Parameter	Study group		Control group	
	r	p	r	p
SBP	0.2807	>0.01	0.0610	>0.01
DBP	0.2338	>0.01	0.0917	>0.01

p >0.01 statistically not-significant

Table 3: Correlation of BMI with CRP (mg/dl) and blood pressure (mmHg) in the study and control groups

Parameter	Study group		Control group	
	r	p	r	p
CRP	0.0828	>0.01	0.0349	>0.01
SBP	0.5189	<0.01	0.2629	>0.01
DBP	0.6283	<0.01	0.3621	>0.01

p<0.01 statistically significant, p>0.01 statistically not-significant

DISCUSSION

Our study shows that an increase in blood pressure level was positively associated with CRP level but it was not significant. The Coronary Artery Risk Development in Young Adults (CARDIA) study has been reported that CRP is associated with hypertension in young adults, but in contrast to the findings in older population the association was not significantly associated after adjusting for BMI¹⁹. However, few studies have reported cross- sectional independent significant association of high BP and CRP levels^{8,20}.

Dar et al had reported a significant correlation between CRP and blood pressure in Kashmiri population¹⁴.

CRP, named for its reaction with the C-polysaccharide of pneumococcus, was originally discovered by Tillet and Francis in 1930²⁴. Primarily it is synthesized by hepatocytes and also probably by some endothelial cells in response to interleukin-6 and possibly other cytokines²³.

Vascular endothelium produces vasodilators: prostacyclin (PGI₂), nitric oxide (NO) and endothelium-derived hyperpolarizing factor, and other vasoactive factors such as prostaglandin E₁ (PGE₁) and endothelins²⁵. CRP directly reduces the production of NO by endothelial cells^{5,26}. This in turn could lead to disturbance of vasomotor tone and unopposed vasoconstriction. CRP upregulates angiotensin 1 receptor – mediated events in vascular smooth cells.²⁷ It also augments the production of endothelin -1, and may induces the expression of inflammatory mediators such as monocyte chemo-attractant protein-1 and soluble intercellular adhesion molecule-1 via endothelin-1 and interleukin 6-dependent pathways²⁸.

Endothelium-dependent vasodilatation is also impaired due to an increase in the oxidative stress that inactivates NO and PGI₂²⁹.

The present study reported significant correlation between BMI and BP which is similar to the study conducted by Saijo et al³⁰.

Previous studies conducted by Mohan et al³¹ and Vikram et al³² have shown a significant correlation between BMI and CRP in south and north Indians respectively. In our study we found a positive correlation between BMI and CRP but it was not statistically significant.

LIMITATION OF THE STUDY

Our study is based on single observational data of CRP, which may not reflect the relationship overtime and may increase the possibility of measurement error. Also highly sensitive CRP (hs-CRP) assay will considerably enhance the value of work. Overall sample size is a limitation of the study. As we have included only males in this study, further studies on a larger sample of both genders need to be done to confirm these findings.

CONCLUSION

CRP, a nonspecific marker of inflammation has been shown to be associated with future incidence of cardiovascular events. Some experts recommend routine measurement of CRP using high sensitivity assays as a major new population screening test for prediction of cardiovascular diseases³³.

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A Study on the Risk Profile of Postnatal Women with Low Birth Weight Babies

Kumar Praveen N

Assistant Professor, Department of Community Medicine, Shimoga Institute of Medical Sciences, Shimoga, Karnataka

ABSTRACT

A descriptive retrospective cross-sectional study using existing data from a one-year birth registers of 6928 postnatal women was done at District McGann hospital, Shimoga, India. The objective was to study the risk profile of the mothers who delivered low birth weight (LBW) babies and their contribution to the problem. Mothers without formal education were 4 times more likely to give birth to LBW neonates than those who had attained higher education. There was a linear decrease in low birth weights of newborns as maternal educational level increased. There was no statistically significant difference among parents' occupations regarding LBW of their newborns. Unmarried mothers were more likely to give birth to LBW babies as compared to their married counterparts and the difference was statistically significant. Hypertension, pre-eclampsia and eclampsia disease complex had the highest prevalence and population attributable risk of low birth weight. Other complications and diseases which contributed to high prevalence of LBW included anaemia, thromboembolic diseases, tuberculosis, malaria and other infections. Prevalence of LBW was high in women with premature rupture of membrane, placenta praevia and abruption of placenta. LBW was strongly associated with gestational age below 37 weeks and also with malnutrition. There was a statistical significant difference between the proportions of LBW infants from mothers who did not receive antenatal care and those who attended for the services. There is need of increasing promotion of reproductive health services in relation to safe motherhood at community level in order to reduce risk factors of LBW.

Keywords: *Postnatal Women; Low Birth Weight; Risk*

INTRODUCTION

Low birth weight (LBW) has been defined by the World Health Organization (WHO) as weight at birth of less than 2500 grams.¹ According to UNICEF, about 18 million infants are born with LBW globally every year. LBW babies carry relatively higher risk of perinatal and neonatal mortality and substandard growth and development subsequently. Morbidity and mortality rates among such neonates are very high. Incidence of LBW in India in the year 2008 was 30%.² LBW is associated with multiple problems such as foetal and neonatal mortality or morbidity. Compromised growth and cognitive development,

with increased risk of cardiovascular and metabolic disorders in adult life, has also been reported.³ Generally the risk of neonatal mortality for LBW infants is 25 to 30 times greater than for infants with birth weight exceeding 2500g, and it increases sharply as birth weight decreases.^{4,5} The increase in survival rates of LBW infants leads to increasing health care costs due to extensive hospital stays. It is estimated that extremely LBW babies are up to six times as costly as normal weight babies.⁶

Low birth weight can be caused either by premature delivery (short gestation) or by foetal growth retardation. Known factors for pre-term delivery and foetal growth retardation which are associated with LBW include low maternal food intake, hard physical work during pregnancy, and illness, especially infections.⁷ Many studies suggest that cigarette smoking, genetic and environmental factors can cause LBW,⁸ short maternal stature, very young age, high parity, close birth spacing, high CD4 cell counts in HIV infections are all associated factors.⁹

Corresponding author:

Kumar Praveen N

Assistant Professor

Department of Community Medicine, SIMS

Shimoga, 577201

Ph - +91-9480467060

E-mail - drpraveenbhat@yahoo.com

Low birth weight is a reasonable well-defined problem caused by factors that are potentially modifiable and the costs of preventing them are well within reach, even in third world countries like India. It is therefore essential to identify risk factors for LBW in various communities in the country in order to come up with feasible intervention strategies to mitigate the problem. Hence it was decided to conduct a study on postnatal women to determine the risk factors associated with low birth weight and compare their effects between pre-term and full term babies and their respective population attributable risk (PAR) at District McGann hospital attached to Shimoga Institute of Medical Sciences, Shimoga, India.

METHODOLOGY

The study was done at District McGann hospital, Shimoga, the major referral and teaching hospital located in central part of Karnataka state, India. This hospital has a large catchment area of about 2 million population and annually about 7000 deliveries take place in the department of obstetrics. 6446 birth registers for pregnant women who gave birth at the hospital in 2009 was reviewed for the factors associated

with LBW. Factors selected from the birth registers were those associated with low birth weights according to studies done elsewhere.^{10, 11} The factors included maternal educational level, marital status, mother's body weight and height before pregnant, presence of serious disease(s) before delivery, antenatal care, complications during delivery, smoking and alcoholic intake before childbirth. We used SPSS version 14 was used to analyze the data. Odds ratio (OR), population attributable risk (PAR) were calculated and p value <0.05 was considered to be significant.

RESULTS

A total of 6928 pregnant women delivered at the hospital in the year 2009. Of these, 938 (13.6%) gave birth to low birth weight babies. Mean weight for registered mothers was 51.28 ± 11.39 kg and the mean height was 158.89 ± 6.75 cm. Most (76%) of the postnatal women were in the 20–35 years age group (mean age = 26.61 ± 6.09 years). (Table – 1). The percentage of low birth weight deliveries decreased as maternal formal education level increased ($\chi^2 = 35.22$, $df=3$; $p < 0.01$).

Table 1: Birth weight of babies by maternal age and education

Variable	Low birth weightn (row%)	Normal birth weightn (row%)	Prevalence of risk factorn (column%)	OR (95%CI)	PAR (95%CI)	χ^2 p-value
Mother's age(yrs)						
16-19	50 (11.96)	736 (88.04)	836 (12.16)	1.08 (0.72, 1.64)	3.5%(1.2, 10.0)	-
20-35	762 (14.57)	4466 (85.43)	5228 (76.05)	1.16(0.85, 1.58)	10.5%(8.6, 28.8)	-
36-55	104 (12.84)	706 (87.16)	810 (11.78)	1.0	-	-
Total	966 (14.05)	5908 (85.95)	6874 (100.0)	-	-	2.6, p= 0.272
Mother's education						
None	54 (27.27)	144 (72.73)	198 (02.89)	3.59(2.18, 5.92)	16.8%(12.6, 19.6)	-
Primary	726 (15.39)	3990 (84.61)	4716 (68.85)	1.74(1.35, 2.26)	31.8%(18.6, 42.2)	-
Secondary	26 (09.09)	260 (90.91)	286 (04.18)	0.96(0.52, 1.77)	0.50%(06.4, 09.8)	-
Higher	156 (09.45)	1494 (90.55)	1650 (24.09)	1.0	-	-
Total	962 (14.05)	5888 (85.96)	6850 (100.0)	-	-	35.22p< 0.01

Out of 4150 pregnant women from rural areas, 644 (15.51%) gave birth to LBW babies. LBW deliveries from rural areas were 206 (11.29%). Unmarried women were almost twice more likely to give birth to LBW neonates than the married ones (OR=1.65; 95%CI= 1.25, 2.17) contributing to about 5% of all low birth weights (PAR=5.4%; 95%CI= 2.8, 7.4). A statistically significant difference in LBW as a result of variations in the types of maternal occupations ($\chi^2 = 25$; $df = 5$; $p < 0.01$) was observed. Women who were farmers had the highest proportion (17.50%) of LBW babies of all the maternal

occupations recorded with twice the likelihood of delivering low birth weight babies than housewives (OR= 1.99; 95%CI= 1.36, 2.91) and PAR = 39% (95%CI= 19.1, 52.9). The highest proportion (17.14%) of LBW babies was observed in mothers who were malnourished (Body Mass Index (BMI) <18). Generally the proportions decreased as the anthropometric measurement increased and the interclass differences were statistically significant ($\chi^2 = 25$; $p < 0.01$) (Table – 2).

Table 2: Status of birth weight by maternal body mass index and antenatal care

Variable	Low birth weightn (row%)	Normal birth weightn (row%)	Prevalence of risk factorn (column%)	OR (95%CI)	PAR (95%CI)	χ^2 p-value
MaternalBMI						
Normal (22 - 25)	220 (12.68)	1514 (87.32)	1734 (27.31)	1.0	-	-
Malnutrition (< 18)	24 (17.14)	116 (82.86)	140 (02.20)	1.42 (0.74, 2.74)	2.6% (01.1, 05.6)	-
Underweight (18 - 22)	418 (15.55)	2270 (84.45)	2688 (42.33)	1.27 (0.99, 1.62)	12.1% (05.4, 22.4)	-
Overweight (25 - 30)	118 (08.94)	1202 (91.06)	1320 (20.78)	0.68 (0.48, 0.94)	10.3% (01.7, 16.7)	-
Obese (> 30)	44 (10.00)	424 (90.00)	468 (06.61)	0.76 (0.47, 1.25)	3.4% (2.1, 07.9)	-
Total	824 (12.98)	5526 (87.02)	6350 (100.0)	-	-	25 p< 0.01
Antenatal care						
Received	930 (13.78)	5816 (86.22)	6746 (98.57)	1.0	-	-
Not received	28 (28.57)	70 (71.43)	98 (01.43)	2.50 (1.34, 4.69)	1.5% (0.7, 2.0)	-
Total	958 (14.00)	5886 (86.00)	6844 (100.0)	-	-	8.77 p< 0.01

Table – 3 shows the gestation age and infant sex distributions by birth weight categories. Out of 920 LBW babies born, 836 (90.87%) were born pre-term, at gestation age below 37 weeks. Premature deliveries were two times likely to result into low birth weight (OR = 2.03; 95%CI= 1.46, 2.83) and contributed about

42.4% of the problem (PAF= 42.4%; 95%CI= 25.3, 55.1). The prevalence of low birth weight was higher (15.66%) in female babies than in male babies (12.06%) and the difference was statistically significant ($\chi^2= 9.26$, $p < 0.01$).

Table 3: Birth weight status according to infant sex and gestational age

Variable	Low birth weightn (row%)	Normal birth weightn (row%)	Prevalence of risk factorn (column%)	OR (95%CI)	PAR (95%CI)	χ^2 p-value
Infant sex						
Male	420 (44.78)	3064 (52.34)	3484 (51.89)	1.0	-	-
Female	518 (55.22)	2790 (47.66)	3308 (48.71)	1.35(1.11, 1.65)	12.7%(4.9, 19.3)	-
Total	938 (13.89)	5854 (86.11)	6792 (100.0)	-	-	9.26p< 0.01
Gestational age (weeks)						
37 - 43	84 (08.58)	978 (90.63)	1062 (92.58)	1.0	-	-
27 - 36	836 (67.87)	4798 (32.13)	5634 (17.42)	2.03(1.46, 2.83)	42.3%(25.3, 55.1)	-
Total	920 (13.71)	5776 (86.29)	6696 (100.0)	-	-	18.09p< 0.01

Table - 4 depicts the association between maternal complications, diseases, and accidents during pregnancy with LBW in a descending order of prevalence. Hypertension, pre-eclampsic toxemia and eclampsia had the highest prevalence (46.67%) among women who had babies with LBW. The disease

complex also had the highest contribution to low birth weight of them all (PAR = 25.2%; 95%CI= 22.0, 27.6). Women with common maternal complications during delivery namely abruptio placenta and placenta praevia had the highest proportions of low birth weight babies of 50 and 45%, respectively

Table 4: Maternal history of complications and infant birth weight

Variable	Low birth weightn (row%)	Normal birth weightn (row%)	Prevalence of risk factorn (column%)	OR (95%CI)	PAR (95%CI)
No complications	208 (09.20)	2052 (90.80)	2260 (32.99)	1.0	-
Some complications	750 (16.34)	3842 (83.66)	4592 (67.01)	1.92(1.53, 2.42)	34.1%(24.1 – 42.3)
Preeclampsia,Eclampsia	112 (46.67)	228 (54.33)	240 (3.50)	4.84(3.32, 7.07)	25.2%(22.0, 27.6)
Bleeding	46 (33.33)	92 (66.67)	138 (2.01)	4.93(2.87, 8.45)	13.1%(10.8, 14.7)

Table 4: Maternal history of complications and infant birth weight (Contd.)

Variable	Low birth weightn (row%)	Normal birth weightn (row%)	Prevalence of risk factorn (column%)	OR (95%CI)	PAR (95%CI)
Fever	06 (33.33)	18 (66.67)	24 (0.35)	3.29(0.88, 12.32)	1.8%(0.0 – 2.4)
Malaria	12 (25.00)	36 (75.00)	48 (0.70)	3.3(1.28, 8.46)	3.4%(1.3, 4.5)
ThromboembolicDiseases	02 (20.00)	08 (80%)	10 (0.14)	2.46(0.27, 22.25)	0.5%(0.1, 0.9)
Tuberculosis	36 (16.98)	176 (83.02)	212 (3.09)	2.02(1.17, 3.48)	6.8%(2.1, 9.7)
Anaemia	214 (14.84)	1228(85.16)	1442 (21.05)	1.71(1.28, 2.28)	19.1%(10.0, 26.2)
Hyperemesis	24 (14.11)	146 (85.89)	170 (2.48)	1.62(0.85, 3.08)	3.6%(1.4, 6.5)
Other infections	292 (13.45)	1878 (86.55)	2170 (31.68)	1.53(1.17, 2.0)	18.4%(7.7, 26.7)
Gestational diabetes	04 (11.11)	32 (88.89)	36 (0.52)	1.23(0.28, 5.43)	0.3%(0.1, 1.5)
Total	958 (13.98)	5894 (86.02)	6852 (100.0)	-	-

DISCUSSION

Findings from this study show that most of the women who gave birth at district McGann hospital were in the 20 to 35 years age group. Although this is the recommended reproductive age group, it was responsible for the highest proportion of low birth weight infants. The percentage of LBW observed in this study (13.6%) was similar to that reported in the Eastern African countries [10]. Malnourished and underweight mothers gave rise to the higher proportions of low birth weight babies. The likelihood of these women to deliver LBW babies concurred with findings from studies done among pregnant women in East Java.^{12, 13} In this study, maternal occupation could not lead to a sound deduction as they were not scientifically classified and unclear because a housewife could at the same time be a manual labourer, businesswoman or unemployed. Many combinations were probable in fraternal occupations thus the factor could not reflect any socio economic effect on birth weight.

While more than half of all mothers took alcohol only 3% did this daily and the strengths of the alcohol were not mentioned. This could be the reason why drinking did not feature as one of the factors for low birth weight in the study area. Similarly, although smoking is one of the most frequently mentioned factors for LBW,¹⁴ it could not be associated with either pre term or small for gestation age weights in this study. The higher risk of giving birth to LBW babies in women who lived single as compared with married ones reflects the importance of socioeconomic support on maternal health and birth outcomes. Mother's antenatal care was associated with infant birth weight. However most of mothers start attending antenatal clinics in their sixth to seventh months of gestation such that most pregnant women who deliver

prematurely (gestation age less than 37 weeks) are normally not included in antenatal clinic attendees.¹⁵

Although no seasons were reported along with birth records the highest proportion of low birth weight infants observed among mothers who were farmers could be attributed to the strenuous work they were subjected to in the field. Farming which involves prolonged standing could be the most probable reason for the increased risk for pre-term birth among such women,¹⁶ thus increased chances of LBW babies. Complications during delivery such as abruptio placenta and placenta praevia have been directly associated with LBW. This concurs with the findings from a study done in the Unites States which reported that about half of all births complicated by abruption of placenta were low birth weight.¹⁷ LBW deliveries were higher in babies whose gestation ages were below 37 full weeks. This shows the effect intrauterine growth restriction rather than prematurity which is a common factor for LBW in developing countries. This observation is in line with findings in a study done in 25 developing settings as compared to findings from developed regions of the world.¹⁸ This could mainly be due to, among other unrecorded factors, poor maternal nutrition and diet around and during pregnancy adversely affect foetal and neonatal outcomes.¹⁹

CONCLUSION

Increased promotion of reproductive health in relation to safe motherhood in both females and males at community level so that the latter group could take responsibility for social-psychological, financial and material support to the former is recommended. It is important to conduct population based studies in order to obtain more information regarding birth weights such as prevalence and population attributable risk

for feasible interventions. Prevention of HIV infections and better management of preeclampsia, eclampsia, anaemia and other infections are likely to reduce the incidence of LBW in the population.

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A Study of effect of Smoking Cessation on Pulmonary Function

Mallikarjuna Vanagundi¹, Prashanth K Srinivasan²

¹Assistant Professor of Physiology, Vijayanagar Institute of Medical Sciences, Bellary, Karnataka, ²Assistant Professor of Physiology, Travancore Medical College, Kollam, Kerala

ABSTRACT

Back ground: Smoking is now identified as a major cause of a wide variety of health problems. Much has been known about ill effects of smoking and tobacco use, but little about the beneficial effects following cessation of smoking habit. Hence this study intends to provide details regarding the same.

Objective: To assess the improvement in pulmonary function of smokers after complete cessation of smoking at pre-determined time durations of about 4 weeks, 8 weeks & 12 weeks.

Methodology: Study was conducted in Bengaluru on 55 healthy adult smokers presenting voluntary to undergo de-addiction. Their baseline FEV1, FVC, FEV1/FVC and PEF were recorded and repeated at various pre-determined intervals after onset of cessation program. Subjects were grouped into quitters and non-quitters based on maintenance of cessation. The results are compiled and statistically analyzed.

Results and Conclusion: Following complete cessation of smoking habit, a definite improvement in all the above lung function parameters was seen. FEV1 improved by 394.14 mL ($p < 0.001$), FVC improved by 335.45 mL ($p < 0.001$), FEV1/FVC increased by 0.0412 ($p = 0.001$) and PEF increased by 0.64 L/sec ($p < 0.001$). The same parameters did not show significant change in non-quitters. The improvement in quitters showed inverse relationship with age and duration of smoking.

Keywords: Smoking Cessation; Quitters; Non-Quitters; Lung Functions; Spirometry; FEV1; FVC; PEF

INTRODUCTION

Smoking now is justified as a major cause of respiratory diseases, heart related ailments, cancer and other wide variety of other health related problems. The total number of tobacco users in the world has been estimated at 1.2 billion, which is expected to rise to 1.6 billion during 2020's. At present, tobacco use causes death of 3.5 to 4 million people globally and expected to increase about 10 million during 2020's.¹

In India, it kills 8 lakh people every year according to Indian Council of Medical Research (ICMR) which amounts to 2200 people dying every day from tobacco related diseases & costs the country Rs.2.5 million through direct medicinal costs, absenteeism, for treatment & loss of income due to premature death.²

Quitting completely is essential to regain good health & reverse adverse effects caused by smoking. In general, after cessation the exaggerated decline of FEV1 noted in smokers gradually becomes similar to that found in non-smokers, but the degree of improvement depends on the patient age, type of respiratory impairment at the time of quitting. Smokers who quit at later stages, above 10-15 years are less likely to experience some improvement in their FEV1 values. By 20 or more years of smoking induced damage, the abnormalities become permanent & include emphysematous destruction of lung parenchyma, chronic inflammation and distortion of pharyngeal air ways.³

Earlier work in the field by Buist AS et al⁴, Townsend MC et al⁵, Emmons KM et al⁶, Sherill DL et al⁷, and other workers have shown that smoking induced reduction in lung function is at least partially reversible and cessation of smoking results in atleast arrest of further decline of the same.

Corresponding author:

Mallikarjuna Vanagundi

No.71, Ex Serviceman Colony,
Cowl Bazaar, Near Belegat Cross,
Bellary, Karnataka

Pulmonary function tests have been done by various investigators but little work has been done on the beneficial effects following cessation of smoking, especially in South Indian population. Individuals who quit smoking are likely to experience improvement in their FEV1 values as well as reduced rate of decline in FEV1. And the added advantage of the present study is that computerized spirometry is used to make the study more accountable, accurate and precise.

OBJECTIVES OF THE STUDY

1. To test whether complete cessation of smoking results in significant improvement in lung function
2. To assess the influence of factors such as age and duration of smoking, on such improvement, if any

MATERIALS AND METHOD

SELECTION OF SUBJECTS

The present study includes 55 adult male smokers from general population of Bengaluru city, who were willing to attempt at abstinence from smoking for the study in the age group of 25-50 yrs. Excluded were the subjects with history of established cardiac diseases, evidence suggestive of respiratory pathology, other factors like recent surgery of thorax and abdomen, dependent use of other psycho active substance, presence of psychiatric morbidity.

After recording the socio-demographic data of the subjects, general physical examination and clinical examination of respiratory system was done to rule out significant pre-existing pathology which may influence the study parameters, followed by a written informed consent from the willing subjects. Subjects in the sample thus selected were divided into three groups according to age. The groups were 25 to 30 years, 30 to 40 years and above 40 years. Subject's physical characteristics like height and weight were measured and recorded. Thereby Body Surface Area was calculated for each subject. The spirometer employed was a Fleisch type pneumotachometer and works on flow detection principle. Information regarding history of smoking was obtained for each subject. Number of pack years was calculated as one pack year = 20 cigarettes smoked per day for 1 year. Accordingly, subjects were classified into three groups of pack years <5, between 5 and 10 and >10.

Base line lung function parameters, i.e., FEV1, FVC, FEV1/FVC and PEF were measured and the predicted values for FEV1, FVC & PEF for each subject were obtained from pre-determined values for age, stature and race as per ERS 93 protocol incorporated in the Spirometer software. After initial assessment the subjects entered a smoking cessation program under the guidance of the investigator. Multiple sessions of counseling were held over a period of few weeks, each session lasting for 20 to 30 minutes. The subjects were also required to attend follow up sessions for the next few weeks during which maintenance of cessation was assessed. The program did not involve medication of any kind but only motivation and support for the subjects to maintain abstinence. At regular intervals of 4 weeks, subjects underwent physical examination and lung function assessment. The same parameters as above were recorded at each of these follow up. The parameters of interest in this study are FEV1, FVC, FEV1/FVC and PEF, other variables of interest being age and number of pack years. At the end of 12 weeks, depending on the performance of each subject, he was assigned to one of the two groups- quitters or non-quitters, quitters including those subjects who were able to successfully maintain abstinence from smoking over the period of study, and non-quitters including those who either never stopped smoking or relapsed on smoking due to various reasons, without significant duration of abstinence. Thus 31 subjects were designated as quitters, and 24 as non-quitters. The various recordings of each subject obtained at different points of time were tabulated.

The two groups were compared with respect to the above changes and significance in differences observed was ascertained by application of statistical tools. Statistical Methods^{8,9} - ANOVA was used to find the significance of difference of PFT parameters between quitters, and non-quitters. Student T test (dependent) was used to find the significance difference of PFT parameters between Baseline and Week 12 for each group quitters and non-quitters. The Effect Size of Cohen was computed to find the effect of quitting and continued smoking on PFT parameters. Pearson correlation co-efficient was used to find the relationship of Age and Number of pack years in relation to improvement in FEV1, in quitters.

RESULTS

Table 1: Comparison of FEV1 between two groups.

	FEV1 in mL		
	Quitters(n=31)	Non-quitters(n=24)	P value
Predicted	3318.21±256.15	3310.45±330.95	P=0.636
Week 0	1868.57±199.88	1819.09±299.06	P=0.679
Week 4	1990.71±211.96	1837.73±288.99	P=0.057+
Week 8	2108.93±209.80	1870.00±294.47	P=0.002**
Week 12	2262.71±200.16	1900.18±300.42	P<0.001**
Average difference (Wk 12 –Wk 0)	394.14	81.09	-
Significance (Week12-Week0)	P<0.001**	P=0.06	-
Effect size (d)	1.91	0.26	-

+ Suggestive of significance

* Moderately significant

** Strongly significant

Table No: 1 depict changes in FEV1 in quitters and non-quitters at intervals of 4 weeks. Here week 0 represents the baseline value immediately prior to the onset of cessation program. There was no significant difference in average FEV1 of the 2 groups at week 0. In subsequent measurements, the difference was found to gradually increase. At week 12, this difference was quite significant as shown by $p<0.001$.

Table 2: Comparison of FVC between two groups

	FVC in mL		
	Quitters(n=31)	Non-quitters(n=24)	P value
Predicted	3954.64±285.33	3953.18±358.88	P=0.684
Week 0	2289.64±226.18	2281.36±232.69	P=0.220
Week 4	2367.14±240.89	2257.27±223.95	P=0.086+
Week 8	2481.43±221.54	2311.82±196.36	P=0.008**
Week 12	2625.09±211.34	2375.03±230.75	P<0.001**
Avg difference (Wk 0-Wk 12)	335.45	93.67	-
Significance (Wk 0-Wk 12)	P<0.001**	P=0.051	-
Effect size (d)	1.47	0.41	-

The table No: 2 depict changes in FVC, in quitters & non-quitters at serial intervals of 4 weeks. At week 0, there was no significant difference in average FVC among the 2 groups. However, at week 12 the difference was significant.

Table 3: Comparison of FEV1/FVC ratio between two groups

	FEV1/FVC ratio		
	Quitters(n=31)	Non-quitters(n=24)	P value
Week 0	0.82±0.06	0.79±0.07	P=0.190
Week 4	0.84±0.06	0.81±0.06	P=0.073+
Week 8	0.85±0.05	0.81±0.08	P=0.020*
Week 12	0.86±0.05	0.80±0.07	P<0.001**
Average difference	0.0412	0.01	-
Significance (Wk 0-Wk12)	P=0.001**	P=0.885	-
Effect size (d)	0.73	0.14	-

The Table No:3, depicting the comparisons of FEV1/FVC ratio between the 2 groups shows that in the quitters group at the end of 12 weeks, the ratio improved by 0.0412 ($p<0.001$) with effect size being moderate (0.73), among non-quitters, the change was insignificant ($p=0.885$).

Table 4: Comparison of PEF between two groups

	PEF (L/sec)		
	Quitters(n=31)	Non-quitters(n=24)	P value
Predicted	9.09±0.43	9.88±0.56	P=0.912
Week 0	2.40±0.37	2.23±0.55	P=0.195
Week 4	2.58±0.45	2.13±0.56	P=0.003**
Week 8	2.77±0.53	2.17±0.56	P<0.001**
Week 12	3.12±0.60	2.16±0.55	P<0.001**
Avg difference (Wk 0-Wk12)	0.72	0.07	-
Significance (Wk 0-Wk12)	P<0.001**	P=0.01	-
Effect size (d)	1.73	0.11	-

Table No. 4 show the trend of PEF changes. At week 0 the values in both groups were close to each other. At week 12, average improvement among quitters was 0.72 L/sec ($p<0.001$) & effect size was 1.73 which was a very large effect, while among non-quitters, the improvement was only 0.07 L/sec and effect size was 0.11 (no effect).

Table 5: Age Vs Mean FEV1 improvement in quitters

Age group	Mean improvement in FEV1 in ml (FEV1 at 12 week – FEV1 at 0 week)
25 – 30 years	400.91
31 – 40 years	380.00
>40 years	351.67
p value	< 0.01*

As seen in Table No 5, the mean improvement in FEV1 in quitters of age group 25-30 yrs is 400.91 ml, that in the middle age group 31-40 years is 380 ml and in the older age group, >40 years the improvement over twelve weeks is only 351.67 ml depicting that mean improvement in FEV1 decreases as age increases.

Table 6: Pack-years Vs Mean FEV1 improvement in quitters

Pack-years	Mean improvement in FEV1 in ml (FEV1 at 12 week – FEV1 at 0 week)
<5	397.78
5-10	375.00
>10	365.56
p value	<0.01*

Table No.6 shows the relationship between duration of smoking and improvement in FEV1 among quitters and it is evident that the improvement after

quitting is worse if the duration and quantum of smoking is higher.

DISCUSSION

The cessation of smoking among the subjects definitely led to improvement in all parameters of lung functions. These changes began as early as 4th week of cessation and gradually increased to reach significant proportion at the end of study period.

Improvement depends on age, where FEV1 decreases as the age increases. Duration and degree of exposure to cigarette smoke also have similar inverse effect on FEV1.

These findings clearly imply that smoking cessation is followed by definite improvement in lung functions which, thereby reduction in respiratory pathology which will in turn have positive repercussions on overall physical, psychological and social well being.

Results obtained from current study were comparable with other studies conducted on similar lines elsewhere.

Study conducted by Thompson¹⁰ on asthmatic smokers who quit smoking showed clinically significant improvement in lung function as early as 1 week of quitting with further improvement up to 6 weeks compared to those who continued to smoke. Quitters experienced mean improvements of 15.2 % in FEV1 percent predicted and mean improvement of 93 L/min in PEF, 6 weeks after smoking cessation.

The findings of the above study closely correlate with those of current study in terms of improvement in FEV1. The differences in the two studies are that our study population comprises of adult healthy smokers and no drug therapy is involved, while Thompson study involves asthmatics & use of corticosteroids, β -agonists, etc.

Imran et al.¹¹ conducted a similar study in Pakistan which also included other parameters like physical well being and social economical impact. At the end of 6 weeks after quitting, average FEV1 among quitters had improved to 65 % of predicted. The improvement was maintained at 12 weeks and was more than 65 % at 18 weeks. This finding correlates well with the findings of our study.

Sherrill et al.⁷ conducted a study which demonstrated that beneficial effects of smoking cessation are maximum for younger individuals and

higher the age at cessation, lesser was the improvement in FEV1 reaching nearly 0 at 80 years. Similarly, our study showed inverse relationship with respect to age and improvement in FEV1 following smoking cessation.

Higgins et al.¹² of National, Heart, Lung and Blood Institute, Bethesda conducted a study to investigate relationships between cigarette smoking & pulmonary function in elderly men and women. The study included non-institutionalized men and women of 65 years and above. The main outcome measures were averages of FEV1, FVC and prevalence of low FEV1 levels. It was found that smokers who quit before the age of 40 years had FEV1 levels similar to never smokers, but FEV1 levels were lower by 7 % and 14 % in smokers who quit at ages from 40 to 60 & after 60 respectively. Lung function was related inversely to pack-years of cigarette use.

Most of the other studies conducted towards similar objectives are long term studies ranging from 5- 20 years & all of them are designed to assess the difference in rate of decline of FEV1 in quitters and non-quitters, the typical finding is that an initial improvement in FEV1 of quitters is followed by decline in FEV1, in both the groups with age but the rate of decline in non-quitters is far more steeper while that in quitters is as experienced by non-smokers, due to natural aging process. Since our study was a short term study it could only demonstrate the initial improvement but further long term changes in FEV1 and other lung parameters could not be assessed.

The other limitation in the current study design is that, how far abstinence was maintained by the subjects was not objectively tested by any laboratory parameters and designation of subjects as quitters and non-quitters was based only on subjects own report. Incorporation of one or more of such tests, though expensive will lead to more stringent assessment and hence more accurate results.

CONCLUSION

With the following analysis and interpretation of the results, the following conclusions were drawn.

1. Cessation of smoking is followed by significant improvement in lung function parameters FEV1, FVC, FEV1/FVC and PEF.
2. The improvement in FEV1 following smoking cessation is greater for younger subjects.

3. Prolonged exposure to cigarette smoke results in less improvement in FEV1 following cessation.

It can be emphasized that effects of smoking on airways is atleast partially reversible and smoking cessation is attended by definite improvement in lung functions. Earlier the cessation, better are the results.

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Department of Physiology, Bangalore Medical College and Research Institute, Bengaluru, Karnataka

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Determinants of Institutional Delivery in Rural Uttar Pradesh: Choice of Delivery Location

Neelanjana Pandey

*Research Scholar, International Institute for Population Sciences,
GS Road, Deonar, Mumbai, India*

ABSTRACT

Access to quality care during pregnancy and especially at delivery seems to be the crucial factor in explaining the disparity in maternal health status. The choice of place of delivery has consistently been found to be associated with maternal and neonatal outcomes. The objective of the present paper is to understand the determinants of delivery location-institutional (public or private) and home; and reasons for non-utilization of facility for delivery care. The District Level Household Survey (2002-04) data for Rural Uttar Pradesh have been used, adopting the conceptual framework of Andersen Behavioural Model. A multinomial Logistic regression analysis was conducted to assess the determinants of home, public and private facilities for delivery. Most of the delivery had taken place at home, with public and private sector accounting for only seven percent and nine percent respectively. Women with higher birth order and those residing far from Primary health centres had greater odds of delivering at home than public facility, while maternal education, Antenatal care visits, regions and pregnancy complications are the significant predictor of institutional delivery. The results indicate that, after controlling for other variables access to health facilities do not have much effect on choice of public facility over home/private. Regional analysis showed significant differentials in reasons for not delivering at health facility. Given the predominance of home deliveries in the rural Uttar Pradesh, every attempt should be made to ensure that these are attended by trained birth attendants.

Keywords: *Determinants, Location of delivery, Public, Private*

INTRODUCTION

The use of health services is a complex behavioural phenomenon. Access to quality care during pregnancy and especially at delivery seems to be the crucial factor in explaining the disparity in maternal mortality and morbidity between the developing and the industrialised world.¹ An estimated 90% of maternal deaths could be avoided, if adequate care was provided.² Childbirth is a risk-producing event, thus women are encouraged to deliver their babies in health facilities as a strategy to improve maternal health outcomes. Population policy of Uttar Pradesh is aimed to increase institutional deliveries from 17 percent in 1997 to 55 percent in 2016, in order to reduce maternal mortality to below 250 by 2016.³ Childbirth in a health institution such as a hospital attended to by trained medical staff with midwifery skills has been shown to be associated with lower rates of maternal and neonatal mortality and morbidity than home births,^{4,7} even though, our society perceives pregnancy as a condition that does not require medical attention.^{8,9} Thus, in order to promote institutional delivery various maternity benefit schemes had been launched by the government.

There were systematic differences in place of delivery and type of attendance at delivery by age of the mother¹⁰ and order of the birth¹¹ and also by caste and standard of living of the woman. But socioeconomic factors, have been shown to be of greater importance in determining health service use than demographic factors and a woman's level of education has been the most consistent finding.^{7,11} Cost has also found to be a potential barrier in service use¹² and it influences the source from which care is sought. Differentials within institutional deliveries have also been observed. With rapid economic growth, there has been a concomitant expansion of the private sector in health care delivery in India. Thus, it is important to tease out the two types of institutions – public and private. With this background, objectives of the present study are- to understand the determinants of delivery location (home, public or private facility) and reasons for not utilizing existing health care facilities in rural Uttar Pradesh, a major state of India, using data from the District Level Household Data-(DLHS-II).

DATA AND METHOD

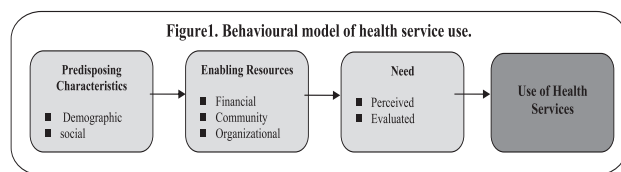
The District Level Household Survey (2002-04) data

for Uttar Pradesh have been used for the present analysis. It consists a comprehensive interview schedule for ever married women age 15 – 49 years, which collected in-depth information on antenatal care and immunization services, institutional deliveries etc. A village schedule was also added in this survey for the information of availability and accessibility of various facilities in the village especially on accessibility of health and education facilities.¹³

The present analysis had been based on rural sample of Uttar Pradesh, in order to link the health facility availability from village schedule. From the sample of 45,020 currently married women aged 15-44 years, data from the live births which took place for the last three years preceding the survey date (n=22,451) has been abstracted. Since the dependent variable had three response categories, along with bivariate analysis, a multinomial logistic (MNL) regression model was used to assess the effect of each variable independently on the dependant variable while controlling for the confounder and relative risk ratio (RRR) have been reported.

Conceptual Model for utilization of delivery care services

Andersen's Behavioural Model of Health Services Utilization was used as the conceptual framework of the study.¹ Figure.1 describes the pathways of the model. A categorical dependent variable was created based on the place of delivery of the last live birth took place into three categories, as 'home' if the mother reported that the last birth occurred at home; 'public' if it took place in a government hospital, government dispensary, community health center or primary health center, and 'private' if the birth occurred at a private hospital, private clinic, and non-governmental organizations (NGO) or trust hospital.



The predisposing variables included in the model were birth order of the child for which care was sought, socio-demographics of the mother and father (maternal age, maternal and paternal education, religion, and caste). Enabling factors are household standard of living (SLI), whether antenatal care (ANC) had been taken and its intensity (number of visits), availability of government health facility in the village, distance to nearest primary health centre (PHC) and regions of residence. Other than ANC and household SLI all the factors are contextual which may impede or promote the utilization of facility. 70 districts of Uttar Pradesh have been classified into four regions using classification of National Family Health survey (see

Appendix 1).¹⁴ Though the potential need for the institutional delivery is universal but the facility coverage has not matched with it, thus need has been defined on the basis of current pregnancy complications. Non-utilization of services by regions with government facilities for delivery have been analyzed and cross classified with above background characteristics of the respondents.

RESULTS

Among the 22,451 currently married women, who gave birth in last three years, the majority delivered at home i.e. 84 %, within private facility and public facility approximately 9% and 7 % respectively. Among predisposing factors higher birth order, non-Hindu religion, Other Backward Classes (OBC) and Schedule caste/ Schedule tribe (SC/ST) status were associated with home delivery while lower birth order and increasing mother's and father's education were associated with institutional delivery specially with private facility (Figure 2.a and Figure 2.b). Though, home delivery is more than 80 % in all the regions but distribution of rest of the women among public and private facilities shows that in western region, after their home women choose to deliver at private facility over public, while in other three regions, percentages of women delivery at public and private facilities were almost equal.

Results of multinomial logistic regression (MNL) have been illustrated in Table 1. Typically the other predictors are held constant at their mean values in the sample for which the MNL regression has been done. Though, birth order and caste of women does not have significant impact on public versus private facility for delivery, but they are important determining factors for institutional delivery over home among the predisposing variables. Women with higher birth order (more than 2 children) had lower odds of delivering at public facility compared to homes (RRR= 0.65, p-value<0.001); while increasing maternal and paternal education were associated with greater odds of delivery in a public facility. Compared to Hindu women, non-Hindu women had lower odds (RRR=0.80, p-value<0.05) of delivering at public health facilities.

Among enabling variables, household standard of living index (SLI) has significant impact on choice of private facility over public. The effect is stronger when private facilities and home deliveries were compared. Antenatal care visits is the strongest predictor of institutional delivery. The odds for delivering at public facilities over home are four times for women who had more than three ANC as compared to those who did not go ANC care. Though, the presence of government health facility in the village does not have impact on institutional delivery but distance from public health facility is negatively associated with choice of delivery at public facility over home delivery.

Figure 2.a Percentage of women by the choice of delivery location for predisposing factors in rural Uttar Pradesh, 2002-04

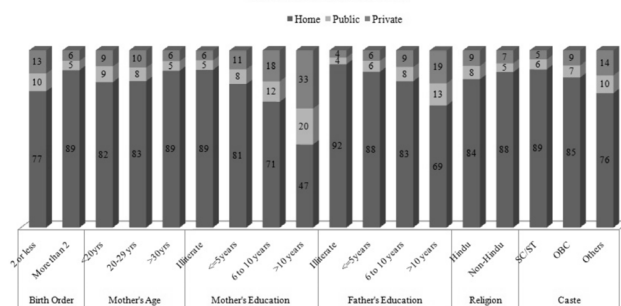


Figure 2.b Percentage of women by the choice of delivery location for enabling and need factors in rural Uttar Pradesh, 2002-04

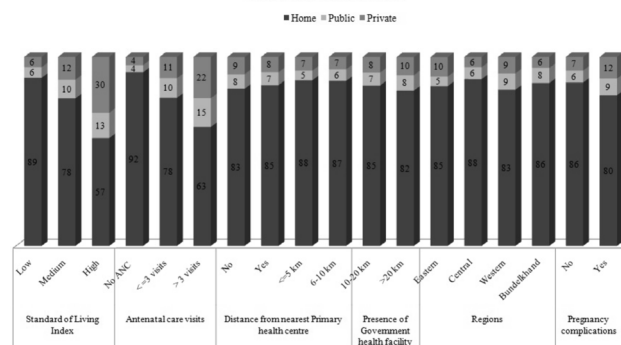


Table 1. Multinomial logit regression analysis of odds of choices of delivery location, Rural Uttar Pradesh, 2002-04

		Relative Risk Ratios(RRR)		
		Public Vs Home	Private Vs Home	Public Vs Private
Predisposing factors				
Birth Order	2 or less®			
	More than 2	0.65***	0.61***	1.06
Mother's Age	<20yrs®			
	20-29 yrs	0.91	1.09	0.84
	>30yrs	1.01	1.18	0.86
Mother's Education	Illiterate			
	<=5years®	1.12	1.24	0.91
	6 to 10 years	1.32***	1.68***	0.79
	>10 years	2.29***	2.65***	0.86**
Father's Education	Illiterate			
	<=5years®	1.34***	1.17	1.14
	6 to 10 years	1.47***	1.37***	1.07
	>10 years	1.55***	1.69***	0.92
Religion	Hindu®			
	Non-Hindu	0.80**	1	0.8
Caste ¹	SC/ST®			
	OBC	1.23***	1.36***	0.9
	Others	1.54***	1.46***	1.06
Enabling Factors				
Standard of Living Index	Low®			
	Medium	1.37***	1.50***	0.91
	High	1.68***	2.53***	0.67***
Antenatal care visits	No ANC ®			
	3 or less	2.54***	2.21***	1.15
	More than 3	4.00***	4.03***	0.99
Distance from Nearest Primary health centre	<=5 km®			
	6-10 km	0.88*	0.93	0.95
	10-20 km	0.70***	0.91	0.77**
	>20 km	0.63**	0.74	0.85
Presence of Government health facility	No ®			
	Yes	1	0.86	1.16
Regions ²	Western®			
	Central	1.38***	0.60***	2.28***
	Eastern	1.52***	0.84***	1.82***
	Bundelkhand	1.93***	0.72***	2.66***
Need Factor				
Pregnancy Complications	No®			
	Yes	1.32***	1.59***	0.83***

Note: 1. Caste has been classified into three categories: SC/ST includes Schedule Caste and Schedule Tribe, OBC includes Other Backward Classes and rest are classified into Others category.

2. Regions of Uttar Pradesh were made according to NFHS-3 Classification.

*** p<0.001, ** p<0.05, * p<0.01

In comparison to Western region of Uttar Pradesh, women belonging to other regions have significantly higher odds of delivering at public facilities over home; on the other hand it has been observed that all the regions have lower odds of delivering at private facility over home as compared to western region. Choice of public facility over private one, for institutional delivery is significantly higher in all the three Central, Eastern and Bundelkhand region as compared to Western Uttar Pradesh. Severity of need (pregnancy complications) favours private facility over public. However, compared to home deliveries, women with

pregnancy complications had 32 % higher odds of delivering at public facility (RRR=1.32, $p<0.001$) and 59 % higher odds of delivering at private facility (RRR=1.59, $p <0.001$).

In addition to examine the determining factors of institutional delivery and choice between public and private facilities, it is also important to understand the causes of non- utilization of facilities even if they are available. Table 2 presents the reasons for not utilizing facilities for delivery by availability of public health facilities for delivery by regions of Uttar Pradesh.

Table 2. Reasons for not delivering at facility by availability of Government health facilities and regions, Rural Uttar Pradesh, 2002-04.

			Western	Central	Eastern	Bundelkhand
Villages with Government facilities for Delivery care	Yes	Not needed	66.2	55.2	63.2	53.2
		Direct/Indirect cost	8.0	10.0	16.1	18.0
		Poor quality and transportation	3.5	5.7	4.0	9.4
		Family did not allow	17.6	15.5	6.8	7.8
		Better care at home	2.5	2.7	5.2	8.3
		Lack of knowledge	2.3	10.9	4.7	3.2
		No	Not needed	73.4	60.3	63.9
Direct/Indirect cost	8.3		7.6	12.9	11.9	
Poor quality and transportation	2.3		4.5	5.4	6.7	
Family did not allow	11.4		14.2	7.4	5.9	
Better care at home	2.7		2.3	4.4	6.1	
Lack of knowledge	1.9		11.1	6.0	3.3	

Majority of women reported that they do not perceive it necessary to deliver at facility in all the regions, irrespective of availability of public health facility. In Western and Central region women do not avail institutional delivery due to opposition of family members (18 % and 16 %) while in Eastern and Bundelkhand region the second major barrier in institutional delivery is direct as well as opportunity cost related with it (16 % and 18 %). Lack of knowledge is also another important issue in Central Uttar Pradesh. It has been observed that presence of facility does not make any huge difference in magnitude of barriers in all the regions.

DISCUSSION

A major strategy outlined in national population policy to reduce maternal mortality is to promote institutional deliveries by strengthening the public health system. Of the 16 % of institutional delivery in Rural Uttar Pradesh which is lower than the national average, equal numbers took place in public and private facilities. This analysis indicates some important predictors of institutional delivery and choice of institution (public or private). Analyses show that among the predisposing factors, birth order,

maternal education and paternal education and caste affect the choice between public/private and home deliveries. Education leads to better health awareness, and this may sensitize the family to the quality of health care, provided at various facilities.¹⁵ It has been observed that region has large effect on choice of institution. Women belonging to western region are more attracted to private facility if they have to go for institutional delivery, in comparison to other region of state especially Central and Bundelkhand regions. Possible explanation behind this may be the economically better off condition of this region and family and community pressure; Central region women reported 'lack of knowledge' as one of the major reason for the non-utilization of facility while women from Bundelkhand emphasised on cost related reasons, which indicate towards low accessibility of the public health services or community's less trust in government health services.

Among the enabling factors, number of antenatal visits and location (region) affected the choice between home and private/public facilities, while a higher standard of living affected the choice of institutional deliveries over home delivery and also favours private facility over public. The better off class have the

Appendix 1. Classification of Districts of Uttar Pradesh into regions, NFHS-3, 2005-06.

Regions	Districts
I(Western)	Bijnor, Ghaziabad, Meerut, Moradabad, Rampur, Saharanpur, Muzzafarnagar, Agra, Aligarh, Bareilly, Budaun, Bulandshahr, Etah, Farrukhabad, Firozabad, Mainpuri, Pilibhit, Shahjahanpur, Etawah, Mathura, Auraiya, Baghpat, Goutam Buddha Nagar, Hathras, Jyotiba Phule Nagar, Kannauj
II(Central)	Kheri, Hardoi, Rae Bareli, Sitapur, Barabanki, Fatehpur, Kanpur Dehat, Kanpur Nagar, Lucknow, Unnao
III(Eastern)	Allahabad, Gonda, Pratapgarh, Sultanpur, Bahraich, Faizabad, Azamgarh, Basti, Deoria, Gorakhpur, Jaunpur, Maharajganj, Mau, Siddharthnagar, Ballia, Gazipur, Varanasi, Mirzapur, Sonbhadra, Ambedkar Nagar, Balrampur, Chandauli, Kaushambi, Kushinagar, Sant Kabir Nagar, Sant Ravidas Nagar, Shrawasti
IV(Bundelkhand)	Banda, Lalitpur, Hamirpur, Jalaun, Jhansi, Chitrakoot, Mahoba

resources to pay for the price of private care, and given the perception of better quality at private facilities. Need defined as pregnancy complication in the study comes out to be a significant determinant of institutional delivery (public/private over home) and also for private over public sector use.

However, among the reasons for non-utilization of facilities, perceived 'need' for institutional deliveries are found to be very low. This may not improve without effective intervention and motivation from the provider side. Cost concerns are also another important barrier in seeking institutional delivery. Sometimes, in public health care institutions cost of travel and opportunity cost in terms of time became higher than actual delivery cost. The third major barrier is familial pressure to deliver at home while only in central region due to lack of knowledge institutional deliveries in government facilities are hindered.

Conflict of Interest: None declared

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A Study of Management of Periodontal Osseous Defects with Xenograft and Bioresorbable Membrane

P Vijay Sunil Reddy¹, Shobha Prakash², Vandana K L³

¹Reader, Department of Periodontics, Navodaya Dental College and Hospital, Navodaya Nagar, Raichur, Karnataka, India. Affiliated to Rajiv Gandhi University of Health Sciences, Karnataka, ²Professor and Head, Department of Periodontics, College of Dental Sciences, Davanagere, Karnataka, ³Senior Professor, Department of Periodontics, College of Dental Sciences, Davanagere, Karnataka, India

ABSTRACT

Recent research has focused upon use of bone substitutes in combination with the GTR barriers for better clinical outcomes of periodontal regenerative procedures. The purpose of this study was to evaluate the efficacy of bovine derived xenograft (Bio-Oss) and bioresorbable GTR membrane (Atrisorb) in interproximal vertical Defects.

Two systemically healthy patients (1 male, 1 female) were selected with 12 sites each. Sites were assigned randomly into control (flap debridement Plus Bio-Oss) and experimental (flap debridement plus Bio-Oss and Atrisorb). Clinical measurements included plaque index (PI), gingival index (GI), probing pocket depth (PPD), Clinical attachment level (CAL), gingival margin position (GMP). Statistical Analysis was performed using the paired and unpaired 't' tests.

In the results, the control and experimental group showed statistically highly significant ($p < 0.001$) Changes in GI, PPD and CAL 9 months post surgery. Between the groups statistical significance was not found in all clinical Parameters. Radiographic measurements showed a statistically highly significant Amount of defect fill in individual in each group and between the groups.

In this study the combined use of GTR barrier and bone graft did not prove beneficial Over the bone graft alone for the clinical outcome of interproximal vertical defect treatment.

Keywords: : Bio-Oss, Atrisorb, GTR, Membrane, Vertical Defects, Bone Graft

INTRODUCTION

Regeneration is defined as a reproduction or reconstitution of a lost part¹. Periodontal regeneration therefore, refers to the restoration of bone, cementum & periodontal ligament after they have been damaged by the periodontal disease process². Various materials and techniques have been evaluated as regenerative treatment for intrabony defects caused by periodontitis.

Latest concept of combining bone grafts or bone substitutes with GTR has resulted in the best clinical

outcomes of periodontal regenerative procedures performed in intrabony defects³ & furcations⁴. Even though human histologic evidence of true regeneration for the combined technique is limited to case reports, positive results are achieved because they combine the benefits inherent in grafting and GTR. The use of combine bone grafts & GTR in the intra osseous defects have shown enhanced results in regenerative clinical outcome¹.

Bovine porous bone mineral (BPBM) (Bio oss) is a relatively new graft material used in periodontal regenerative procedures. This material is an anorganic bovine mineral prepared by protein extraction of bovine bone which results in a porous structure similar to human cancellous bone and has the ability to enhance bone formation by osteoconductivity⁵. The polylactic barrier (Atrisorb) is composed of poly (DL-lactide) (PLA) dissolved in N-methyl-2-pyrrolidone (NMP), which exhibits biodegradation. It is flowable and is applied directly over the periodontal defect. As

Corresponding author:

Vijay Sunil Reddy

Reader,

Department of Periodontics,

Navodaya Dental College and Hospital,

Navodaya Nagar, Raichur, Karnataka, India

Contact no.: +91 9590233446

Email: vijaysunilreddy@rediffmail.com

it is bioadhesive it adheres to the surrounding tissues after polymerization and eliminates the need for stabilizing sutures.

Hence, the present study has been undertaken to evaluate the efficacy of resorbable GTR (Atrisorb) barrier & bovine derived xenograft (Bio-Oss) as a periodontal regenerative material in the treatment of human periodontal osseous defects (interproximal vertical defects).

Bio-Oss (100% inorganic bone mineral of bovine origin)

Bio-Oss is a xenogenous bone mineral which serves as a biological guiderail for the body's own bone (osteoconduction), thus promoting bone regeneration in a natural manner.

Physical Characteristics

Inner surface area	- 97m ² /g
Porosity	- 60%
Crystalline size	- 10-60 nm

Chemical Characteristics

Calcium phosphate index – 2.03.

ATRISORB

Polylactic acid barriers have shown successful clinical results in human trials. A fluid polylactic acid based barrier has been recently developed (Atrisorb).

Atrisorb (Manufactured by Atrix laboratories, Inc,) is composed of a polymer of lactic acid, poly (DL-Lactide) (PLA) dissolved in a biocompatible carrier N-methyl-2pyrrolidone (NMP). Atrisorb exists as a fluid which transforms to a solid on contact with water or other aqueous solutions.

The patients for this study were selected from the out patient Department of Periodontics, College Of Dental Sciences, Davangere, Karnataka. The patients of both the sexes , age group b/w 20-45 (mean age 32)years,presence of at least two interproximal sites approximately separated in the same jaw or opposing jaw in the same patient,the interproximal periodontal pocket measuring ³ 6mm with vertical bone loss radiographically & patients who had not taken any

type of periodontal therapy prior to 6 months of initial examination were included. Patients with compromised systemic health, who had taken antibiotics 1month prior to the study, allergic to tetracycline or chlorhexidine, pregnant or lactating mothers ,showing unacceptable oral hygiene during pre surgical period and smokers were excluded from the study.

STUDY DESIGN

A total of 24 sites were divided into control & experimental sites randomly.12 Sites were treated with flap debridement followed by placement of Bio-Oss. (control sites) & 12 Sites were treated with flap debridement followed by placement of Bio-Oss & Atrisorb. (experimental sites).

The clinical parameters recorded were plaque index (Silness & Loe, 1964), gingival index (Loe and Silness, 1963), probing pocket depth, clinical attachment level, gingival margin position at baseline, 3, 6 & 9 months. All the measurements were standardized using customized acrylic stents with grooves which were prepared on the study model of the patients. The recordings were made using a Hu-Friedy UNC 15 probe.

Surgical procedure consisted of raising a full thickness flap & exposure of osseous defects , followed by thorough surgical debridement & root biomodification.

IOPA radiographs were taken for each site before surgical procedure & at intervals of 3, 6 & 9 months using long cone/paralleling technique.

The scanned images, stored in JPEG format were transferred to CORAL DRAW 7 . For measurement, connector line tool was used. The CEJ, the base of the defect & the crest of alveolar bone were located on the image. Using the connector line tool, a line is drawn from CEJ to base of the defect.

STATISTICAL ANALYSIS

Changes in the vertical probing depths in both experimental and control groups were analyzed by paired 't' test with in a group(intra-group) and inter-group comparison was done by unpaired 't' test. The results were also ascertained by nonparametric test



Fig. 1. Atrisorb Free Flow (GTR Barrier)

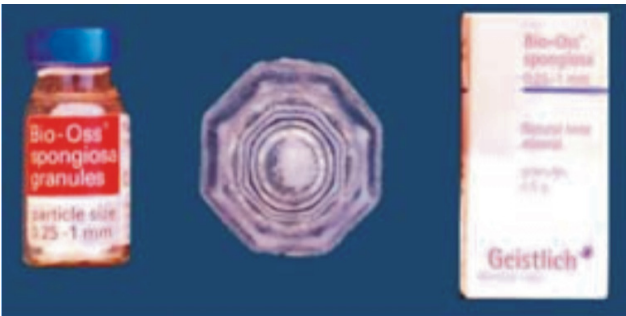


Fig. 2. Bio-Oss (Bovine Bone Mineral)

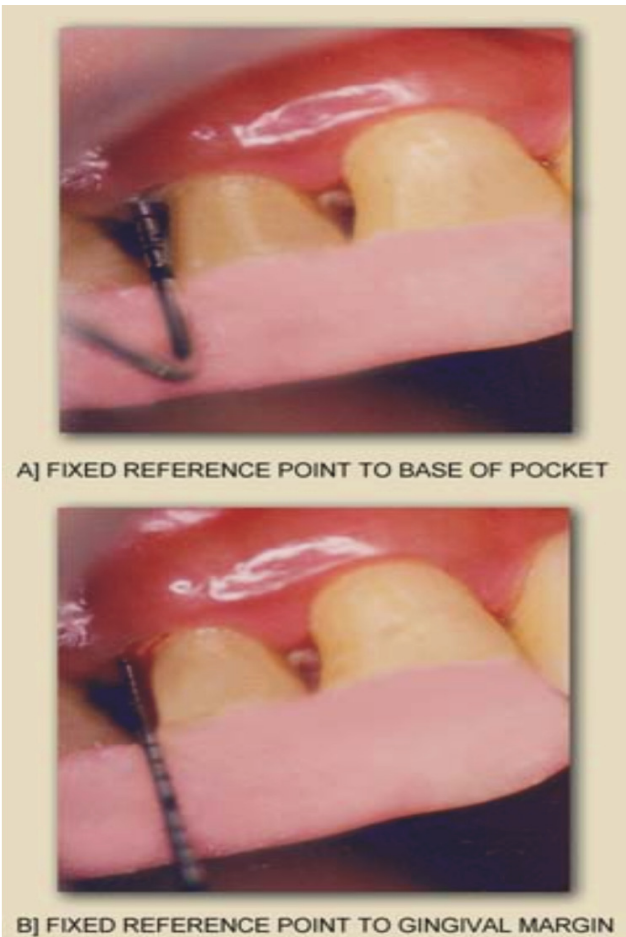


Fig. 3. Baseline Measurements (0-day) Vertical Probing

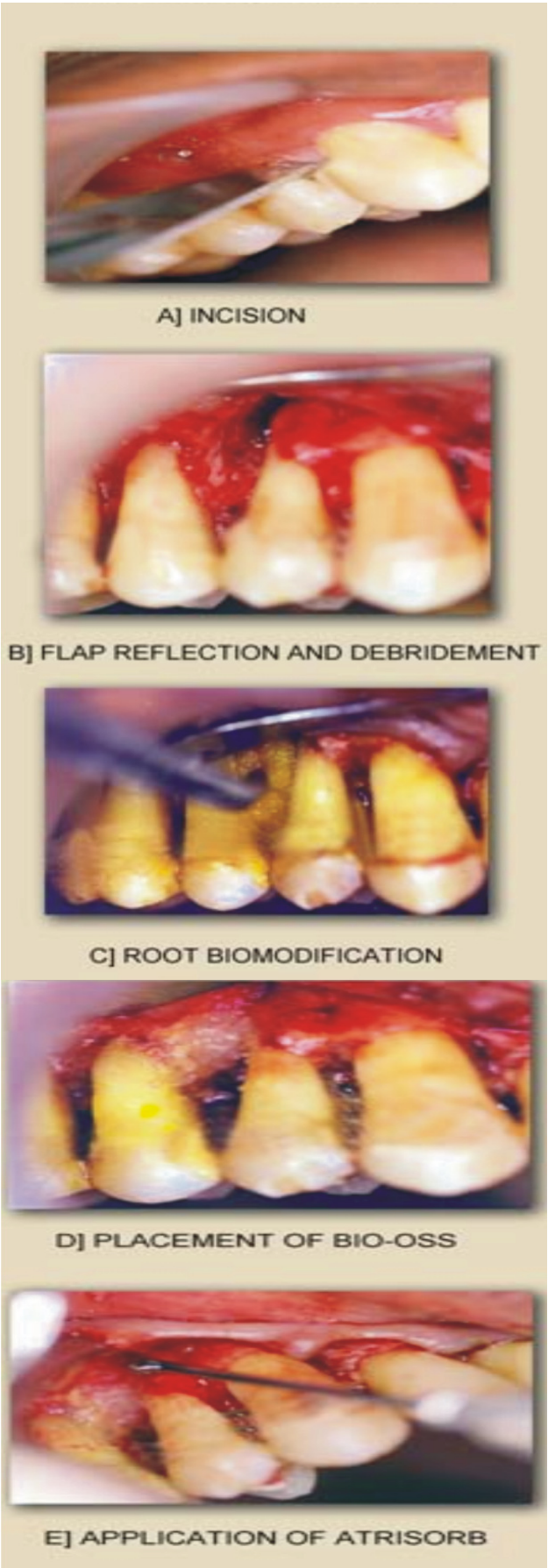


Fig. 4. Surgical Procedure

RESULTS

Table No.1 : Table shows the mean values of changes in pocket depth, CAL and Gingival margin position.

Clinical Parameters	Time of Assessment	Control			Experimental			Control Vs Experimental	
		Mean \pm SD	Diff from BL	P-value*	Mean \pm SD	Diff from BL	P-value*	Mean diff	P-value
Pocket Depth	Pre -op[BL]	7.8 \pm 0.5	-	-	6.3 \pm 1.5	-	-	1.5	0.01 ,S
	3m	6.8 \pm 0.5	1.0 \pm 0.0	< 0.001	5.3 \pm 1.4	1.0 \pm 0.9	< 0.01	0	0.75 ,NS
	6m	6.5 \pm 0.9	1.3 \pm 0.5	< 0.001	4.5 \pm 1.0	1.8 \pm 1.8	< 0.05	0.5	0.36,NS
	9m	6.5 \pm 0.9	1.3 \pm 0.9	< 0.001	4.4 \pm 1.4	1.9 \pm 2.3	<0.05	0.6	0.40,NS
CAL	Pre -op[BL]	7.0 \pm 0.0	-	-	6.3 \pm 1.9	-	-	0.7	0.19,NS
	3m	6.0 \pm 0.0	1.0 \pm 0.0	< 0.001	5.3 \pm 1.9	1.0 \pm 1.0	< 0.01	0	1.00,NS
	6m	5.8 \pm 0.5	1.2 \pm 0.5	< 0.001	4.8 \pm 1.6	1.5 \pm 1.4	< 0.01	0.3	0.57,NS
	9m	5.8 \pm 0.5	1.3 \pm 0.5	< 0.001,HS	4.6 \pm 1.4	1.7 \pm 1.6	< 0.01,S	0.4	0.40,NS
Gingival	Pre -op[BL]	0.8 \pm 0.5	-	-	- 0.3 \pm 1.5	-	-	1.1	<0.05,S
Margin Position	3m	0.8 \pm 0.5	0.0 \pm 0.0	NS	- 0.2 \pm 1.2	- 0.1 \pm 0.6	NS	0.1	0.33 ,NS
	6m	0.8 \pm 0.5	0.0 \pm 0.0	NS	- 0.2 \pm 1.1	- 0.1 \pm 0.5	NS	0.1	0.58 ,NS
		0.8 \pm 0.5	0.0 \pm 0.0	NS	- 0.2 \pm 1.0	- 0.1 \pm 0.8	NS	0.1	0.50,NS

Table No.2: Shows mean values of Radiographic changes

Measurements	Notations	Experimental		Control		Experimental vs Control	
		Mean \pm SD	P	Mean \pm SD	P	Mean Diff.	P. Value
	Q – R	6.40 \pm 0.97	—	0.45 \pm 1.54	—	0.05	NS
	Q ^o – R ^o	3.70 \pm 2.08	—	1.82 \pm 0.04	—	1.88	< 0.01, S
Amount of defect fill	(Q-R) – (Q ^o – R ^o)	2.70 \pm 2.74	< 0.01 S	4.63 \pm 1.58	HS	1.93	< 0.01, S
% fill of original defect	(Q-R) – (Q ^o – R ^o) (Q – R \times 100)	37.0 \pm 50.1	—	70.5 \pm 6.0	—	33.5	< 0.01, S
Change in Alveolar Crest	R – R ^o	1.86 \pm 1.61	< 0.01 S	0.35 \pm 3.13	0.70 NS	1.51	NS
% change in Alveolar Crest	R – R ^o / Q-R \times 100	29.4 \pm 27.5	—	14.4 \pm 41.1	—	1.5	NS
% of original defect resolution	[(Q-R) – (Q ^o – R ^o)] – (R – R ^o) / Q – R \times 100	7.6 \pm 50.6	—	56.1 \pm 47.2	—	48.5	NS

Graph 1 & 2: Shows measurement changes in pocket depth and clinical attachment levels.

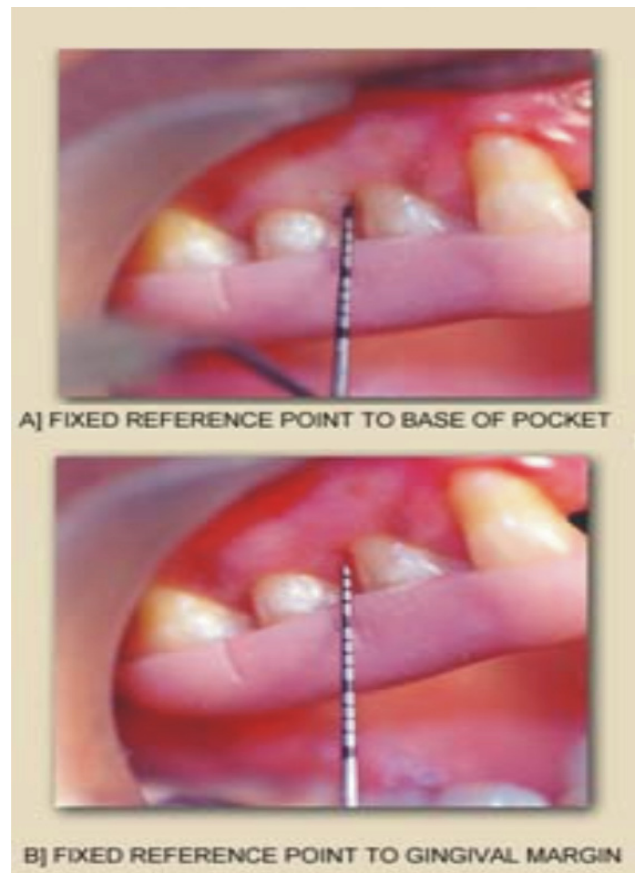
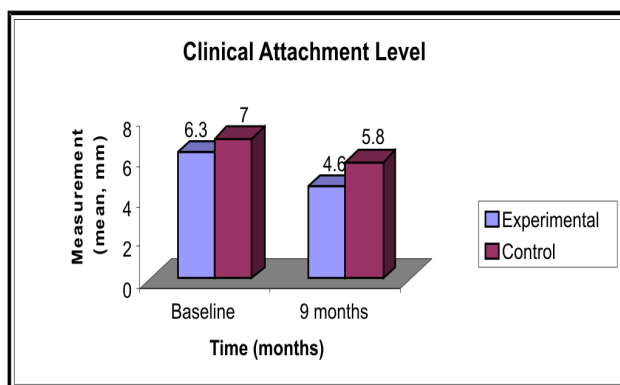
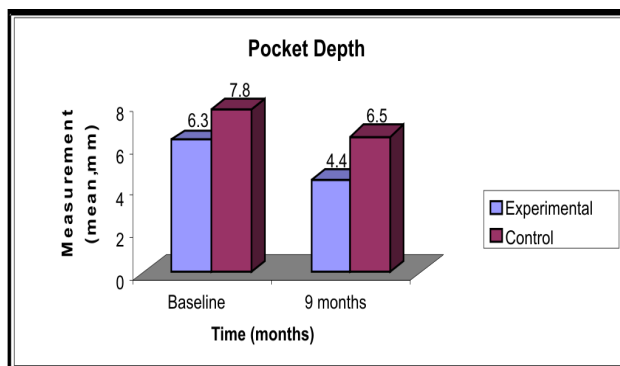


Fig. 5. 9 months post op

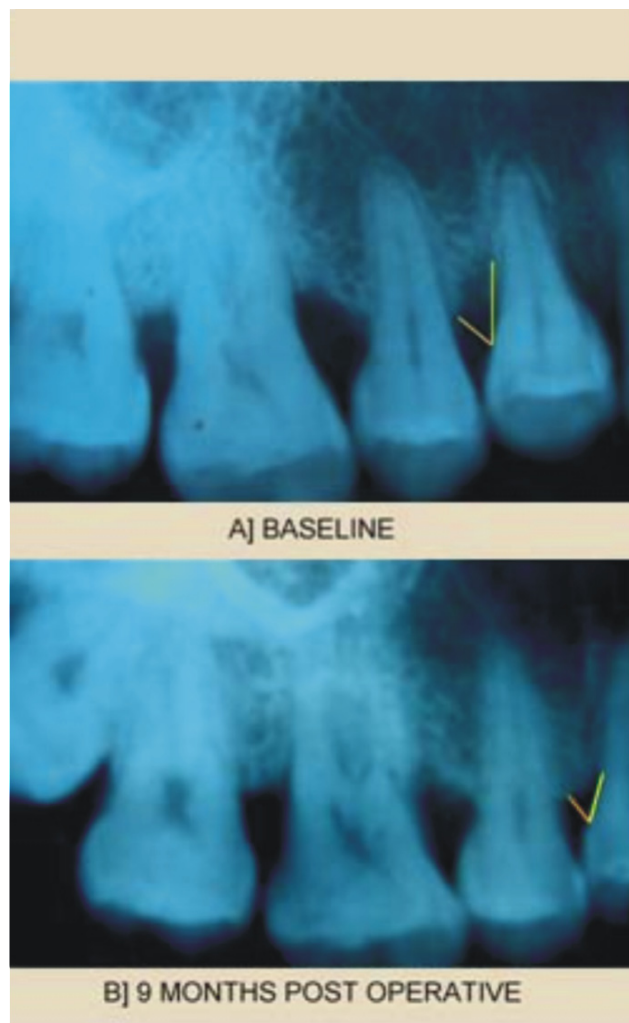


Fig. 6. Radiographic measurements

DISCUSSION

Bone replacement grafts have been used to help, facilitate and promote periodontal regeneration, defined as the reproduction or reconstruction lost or injured periodontion. Several bone substitutes have been used other than autogenous and allogenic bone grafts in clinical periodontal therapy to encourage bone formation. They may be synthetically derived or processed from skeletal structure of other species, are biocompatible and non-organic.

Many studies have used bone graft material in combination with barrier membrane because bone grafts aim mainly to provide space maintenance and to recruit cells with regenerative potential. It is believed that these materials not only maintain the space but also might provide an osteoinductive and/or osteoconductive capacity⁶. For practical and ethical reasons it is impossible to systematically apply histological evaluations in clinical studies. Consequently clinical parameters such as clinical

attachment level and marginal bone level changes as assessed by probing with or without flap elevation, can only be used as indirect indicators to true attachment level charges.

Bio-Oss most closely resembles human cancellous bone as compared to DFDBA and synthetic HA. To date only autogenous bone and DFDB allografts have demonstrated the ability to promote regeneration of cementum, periodontal ligament and bone. However DFDBA, its use and predictability has been questioned.

A study conducted by Richardson CR, Mellonig J (1999)⁷ concluded that there is no statistical difference between Bio-oss & DFDBA when used in vertical defects when compared to one another⁸.

Atrisorb reduces the potential source of bacterial contamination. It is available as a flowable material that can solidify in situ when exposed to an aqueous environment and ensures primary barrier coverage by the soft tissue and complete seal of the defect from epithelial and gingival cell migration.

In this study (Positive control) control site was grafted with Bio-oss alone and the experimental site was grafted with Bio-oss over which Atrisorb was applied. A non graft control (negative control) was excluded as numerous studies have demonstrated a statistically significant result favouring bone grafts when compared to a non-grafted site as suggested by Bower et al (1989)⁹ Mellonig (1992)¹⁰, Richardson CR, Mellonig J (1999)¹¹ and Camargo et al (2000)¹².

All patients in this study showed good compliance and the healing period was uneventful for both the experimental and control groups. Signs of inflammation or any other complications was not evident in any of the patients.

In this study clinical parameters were compared and an attempt was made to compare, the results radiographically too. Measuring the success in the regenerative procedures requires on analysis of parameters used in the comparative studies. The most reliable outcome for assessing periodontal regeneration is human histologic investigation, however the morbidity associated with this techniques and the practical and ethical restrains precludes clinically, statistically significant reduction in pocket depth and gain in CAL was seen in both control and experimental sites from post-op 9 months. However, on comparison statistically significant difference was not found. This is in agreement with results obtained by James T. Mellonig (2000)¹³, Vouros I et al (2004)¹⁴.

Radiographic Assessment

The radiographic techniques used in this study includes long cone/paralleling technique in combination with digital processing of the images to measure bony changes. The fixed reference point used was CEJ. Measurement carried out were from CEJ to base of the defect and CEJ to the Alveolar Crest similar to the radiographic measurements used by Parashis (2000)¹⁵.

On comparison between two groups amount of defect fill was found to be significant and percentage of amount of defect fill was not significant. This is in agreement with the authors Lundgren D, Slotte C (1999)¹⁶ and Richardson CR, Mellonig J (1999)¹¹.

SUMMARY

Bio-oss bone graft material and Atrisorb GTR membrane were found to be well tolerated with tissues. Both experimental and control sites exhibited comparable recession pattern, similar tissue healing, no adverse tissue reactions.

In this study the combined use of GRT barrier and bone graft did not prove beneficial over the bone graft alone for the clinical outcome of the interproximal vertical defect treatment.

However, further studies should include large sample sizes and methods which more accurately identify and measure the morphology of bone defects and longer follow up time to determine the long term effects of Bio-oss bone graft and Atrisorb GTR membrane treatment.

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Study of Health Profile of Adolescent Girls in Kurnool District of Andhra Pradesh-India

Pasi A L¹, Hanchate M S¹, Pasha M A M²

¹Assistant Professor, ²Head of Department, Dept. of Community Medicine, Santhiram Medical College, Nandyal, Kurnool

ABSTRACT

Adolescent constitute over 21.4 % of the population in India. This period needs special attention because of turmoil of adolescence faces due to different stages of development, different circumstances, different needs and diverse problems. The psychosocial and emotional problems are of considerable magnitude and they may exert significant influence on their nutritional status. Unfortunately assessment of nutritional status of adolescent girls has been the least explored area of research particularly in rural India

Objectives: of the present study were to (i) assess the nutritional status of the adolescent girls (ii) find out the reproductive health problems of the adolescent girls.

Methods: Community based cross sectional study.

Results: 68.9% of the study subjects had hypochromic red cells suggesting Iron deficiency anaemia. The mean age of the menarche was found to be 13.7 years. Dysmenorrhoea was the commonest problems faced by adolescent girls. Two third of study subjects were undernourished (BMI <18.5 Kg/M²). To achieve the optimum health and development of the adolescent segment of the population. There is a need to introduce a comprehensive Adolescent Health Initiative (AHI) at block level.

Keywords: Adolescent Girls, Anemia, BMI

INTRODUCTION

Adolescents constitute over 21.4 % of the population in India. This age group needs special attention because of the turmoil of adolescence which they face due to the different stages of development that they undergo, different circumstances that they come across, their different needs and diverse problems. In this context, UNICEF (United Nations Childrens Fund) and UNFPA (United Nations Fund for Population Activity) in collaboration with WHO, issued a joint statement on the reproductive health of adolescents in 1989, to address their problems¹. 'Adolescent' refers more broadly to the phase of human development encompassing the transition from childhood to adulthood. In terms of age, it is the period of life that is extended from 10-19 years, which includes pubertal development also. This period is very crucial since these are the formative years in the life of an individual when major physical, psychological and Behavioural changes take place. Anaemia is the major nutritional deficiency found in this group in India and other developing countries². The meeting of the United Nations Sub Committee on Nutrition held in Oslo in

1998 concluded that more data on the health and nutrition of school children were needed to assess the scale of problems found in this group³. Traditionally, the main health indicator used by health planners has been the mortality rate. Adolescents have the lowest mortality among the different age groups and have therefore received low priority. However, recent studies have shown that the prevalence of malnutrition and anaemia is high in these age groups^{4,5}. A young woman in adolescence is at a high risk of anaemia and infants born to iron-deficient mothers also have a higher prevalence of anaemia in the first six months of life (Perziosi et al., 1997). Maternal mortality is increased in women whose hemoglobin levels fall below 6-7 g/dl (Brothwell et al., 1979). Menarche is a complex of growing up. From both medical and social perspectives, it is often considered as the central event of female puberty, as it suggests the possibility of fertility. The age of onset of the menstrual cycle varies from 9-18 years, with the average age in the United States being about 12 years and 8 months, whereas in India, it is slightly lower and has been reported to be around 12 years^{6,7,8}.

Menarche further calls for special attention because of the physical and emotional problems associated with it. Though the menstrual cycle is a normal monthly function of a healthy female body, the main concern is delayed menstruation, irregular cycles pertaining to hormonal fluctuations and pain during menses. Primary dysmenorrhoea is defined as painful menses in women with normal pelvic anatomy, usually beginning during adolescence. It is characterized by crampy pelvic pain beginning shortly before, or at the onset of menses and lasting for one to three day⁹.

The psychosocial and emotional problems associated with menarche are of considerable magnitude and they may exert a significant influence on the nutritional status of the women. Unfortunately, the assessment of the nutritional status of adolescent girls has been the least explored area of research, particularly in rural India.

Hence, the present study was done with the objective of assessing the health problems among adolescent girls in the rural area of Kurnool District of Andhra Pradesh-India.

OBJECTIVES

- To assess the nutritional status of adolescent girls.
- To find out the reproductive health problems of adolescent girls.
- To suggest recommendations based on the findings of the study.

MATERIAL AND METHOD

Community based study was a cross sectional study was conducted in the rural areas of Kurnool District by employing a multistage sampling method. Study was conducted from Dec 2008 to April 2009. The approximate population of this area is 230451. The total 168 villages and 224 Anganwadi centers were involved. The study population included all adolescent girls in the age group of 10-19 years.

A rapport was developed with the Child Development Project Officer (CDPO), Mukhyasevika, and Anganwadi, workers of the Integrated Child Development Scheme (ICDS Programme) and community health visitors or lady health visitors (LHV) to get an idea about the perceived health practices among adolescent girls in the study area.

Stage-1

One Community Development Block (i.e. Nandyal) was selected from nine CD Blocks of the Kurnool District by simple random sampling.

Stage-2

The Anganwadi centers of Nandyal were selected by simple random sampling. From the selected Anganwadi centers, three adolescent girls were selected using following criteria's,

Inclusion Criteria

- Girls between 10 -19 years of age.
- Residing in the village
- Wiling for clinical examination

Exclusion Criteria

- Girls above 20 years and below 9.
- Not willing for examination.

Total 620 adolescent girls participated in the study.

MEASUREMENTS

Body Mass Index (BMI): was computed by using standard formula¹⁰

$$\text{BMI} = \text{Weight in Kg} / (\text{Height in meters})^2$$

Hemoglobin

Hb was estimated by Sahli's method. Anemia was defined as per the WHO criteria for different ages¹¹. Also, MCHC was measured¹².

A cramping lower abdominal pain which radiated to the back and lower legs during or before onset of menstruation was classified as Dysmenorrhoea¹³. Premenstrual syndrome (PMS) is recurrent, which is a variable cluster of troublesome physical and emotional symptoms developing 7-14 days before the onset of menstruation and subsides when menstruation occurs. Symptoms include low backache, anorexia, fatigue, breast heaviness, abdominal bloating, increased weight, headache, irritability, gastrointestinal symptoms¹⁴.

A cycle that occurs every 21-35 days and flow lasts for 2—7 days, with an average flow of not more than 80 ml and not less than 30 ml, is taken to be a normal

cycle. Any two cycles with duration of more than three months, is labeled as one missed cycle¹⁵.

The data was collected by personal interviews on a pretested, semi structured questionnaire. The confidentiality of the information was assured and the verbal consent of the girls was taken before initiating data collection. The questions pertaining to menstrual problems, regularities of menses and dysmenorrhoea were collected.

Data analysis was done by using SPSS version 16.0.

RESULTS

Sociodemographic Profile: out of total 620 respondents, 5.4, 32.7 and 61.9 percent girls were in the age group of 11-14, 14-17 and 17-19 years respectively. Mean age of the study participants was calculated to be 16.9 years. Most (77.6%) of the subjects were students, followed by school dropouts (22.4%). 62.3% were educated up to the 5th-10th standards. Of the school going girls, most (36.3%) were studying in standard 11th to 12th and only 1.4% were doing their graduation. (Table 1).

Table 1: Sociodemographic Profile of Study participants (n=620)

Age in years	Number	Percentage
15-Nov	33	5.4
15-17	203	32.7
17-19	384	61.9
Mean \pm SD = 14.97 \pm 1.12		
Education of study participants		
10-May	386	62.3
11	114	18.4
12	111	17.9
Graduate	9	1.4

Table 2 Body Mass Index (BMI) of study participants (n=620):

BMI	Number	Percentage
<18.5	430	69.3
18.5 - 25	175	28.3
>25	15	2.4

Various anthropometric indices were used to pinpoint the nutritional status of the adolescent girls. As per the WHO criteria, 69.3% adolescent girls were underweight (BMI < 18.5), 28.3% were normal and 2.4% were preobese¹⁰.

Out of total 620 study participants only 589 agreed for Hb estimation. Mean Hb level was found to be 11.8 \pm 1.52 gm/dl. 41.9% of the study subjects were anaemic

(Hb < 12 gm%) (table 3) . It was found that 68.9% (MCHC < 34 %) of the study subjects showed hypochromic red cells, suggesting the possibility of iron deficiency anaemia (Table 3). The end result of iron deficiency anaemia is nutritional anaemia, which is not a disease entity. It is rather a syndrome caused by malnutrition in its wider sense.

Table 3 Hemoglobin level of study participants (n=589):

Hemoglobin (gm/dl)	Number	Percentage
<12	247	41.9
>12	342	58.1
MCHC (%)		
<34	406	68.9
>34	183	31.1

Mean \pm SD 11.8 \pm 1.52

It was found that hemoglobin content and educational status have statistically significant differences. (p<0.005), [Table 4].

Table 4 Association of Hemoglobin level with educational status

Hemoglobin Level (gm/dl)	Education Status			
	1-10	11-12	Graduate	Total
<12	143	103	1	247
>12	225	110	7	342
Total	368	213	8	589

Chi-square = 8.49

Df= 2

p<0.05

The mean age of menarche was found to be 13.7 years. [Table 5].

Table 5 Distribution of study participants according to age at menarche

Age in years	Number	Percentage
11	9	1.45
12	76	12.26
13	179	28.87
14	183	29.52
15	124	20.00
16	45	7.26
17	3	0.48
18	1	0.16
Total	620	100

Mean \pm SD 13.7 \pm 1.19

Problems related to the menstrual cycle: Dysmenorrhoea (44.2%) was the commonest problem faced by adolescent girls. More than half of the study subjects had one or the other symptoms of PMS as shown in table no.6.

Table 6 Study participants according to reproductive problems:

Symptoms	Number	Percentage
Dysmenorrhoea	274	44.19
Irregular Menses	102	16.45
Irritation	131	21.13
Malaise	59	9.52
Headache	88	14.19
Chest pain	51	8.23
Abdominal bloating	126	20.32
Constipation	70	11.29
Tightness in chest	66	10.65
White Discharge	229	36.94

Multiple responses

DISCUSSION

Mean age of the study participants was calculated to be 16.9 years. Most (77.6%) of the subjects were students, followed by school dropouts (22.4%). However, only 1.2% girls were school dropouts among the adolescent girls in urban areas¹⁶. 62.3% were educated till 10th standard.

Clinical examination has always been and remains an important practical method for assessing the nutritional status of a community. Nutritional anaemia has been considered as an important problem in adolescent girls.

Nutritional anthropometry predominates above the other methods of nutritional assessment. Several workers^{17,18} have emphasized the importance of Body Mass Index (BMI) as an index of nutritional assessment.

As reported elsewhere^{19,20}, a high prevalence of undernutrition (BMI<18.5) was observed in adolescent girls in the rural areas of Karnool district, however, only 2.3% of adolescent girls were found to be underweight in urban areas. This indicates that adolescent girls are the worst sufferers of the ravages of various forms of malnutrition since the beginning of adolescent period. This phenomenon remains uninterrupted throughout their life. Variations in the extent of undernutrition among adolescent girls could be attributed to differences in socio-cultural practices, levels of socio-economic development, values attached to the girl child and prevailing dietary practices in different settings.

Besides clinical examination and nutritional anthropometry, estimation of hemoglobin (Hb) is an

important component of nutritional assessment. Even if nutritional anaemia is prevalent in adolescent girls, in order to assess it properly, Hb estimation and the study of biochemical parameters are required. In contrast to reports elsewhere^{21,22}, a low prevalence of anaemia was observed in adolescent girls in the study area.

The mean age for menarche was calculated to be 13.7 years, as was reported by other researchers²⁴, however, in urban areas, the mean age of menarche among the girls was much earlier as against the earlier reported age of 12-14 years in India²³

A majority of the girls had one or more problems related to their menstrual cycles. Dysmenorrhoea (44.2%) was the most common problem reported to be associated with menstruation by the study subjects. Dysmenorrhoea has been reported to be commonest menstrual problem by other researchers also²⁴⁻²⁷. As per the other authors, the prevalence of dysmenorrhoea is 54% (53% in girls in urban areas and 56% in girls in rural areas)²⁸.

Premenstrual syndrome (PMS) was reported by almost all the subjects. Dysmenorrhoea (44.2%) was the commonest problem faced by adolescent girls. More than half of the study subjects had one or the other symptoms of premenstrual syndrome (PMS), namely; irregular menses 16.9%, irritation-21.7%, malaise – 9.5%, headache-14.2, chest pain- 8.2%, abdominal bloating 20.3%, constipation- 11.3%, tightness in chest 10.6% and white discharge-38.3 %. This situation is serious with respect to the findings of the present study. However, comparatively low figures have been reported by other researchers²⁹. In the literature also, PMS has been reported to be one of the most distressing problems associated with the menstrual cycle³⁰⁻³².

CONCLUSION

The study concludes that a majority of the girls had clinically obvious nutritional deficiency diseases. Two third of the study subjects were undernourished (BMI <18.5 kg/m²). Out of the 589 girls who were checked, 247 were found to be anaemic. As the problems related to menstruation are quite frequent and often result in the interruption of the daily routine of the adolescent girls, it is important that school officials and school health programme personal may be sensitive to their problems. Adolescents are expected to enjoy good health, but this does not seem to be the case in the

rural areas of developing countries like India, where poverty, malnutrition and repeated infection are rampant.

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Epidemiology of Animal Bites - A Study at Anti Rabies Center, District Head Quarter Hospital, Rajahmundry, Andhra Pradesh

S K Patnaik

Assistant Professor, Department of Community Medicine, G.S.L. Medical College, Rajahmundry, Andhra Pradesh

ABSTRACT

A study was conducted during June-July 2012 at Anti-rabies centre (ARC), District Headquarters Hospital, Rajahmundry to study the types of Animal bites and classification of bites, to study various practices of people after sustaining animal bites and to study the functioning of ARC. A total of 100 fresh animal bite victims were interviewed (exit interview) on a predesigned questionnaire. The information on the functioning of Anti Rabies center was obtained from Medical officer-in-charge of the ARC. The data were manually analyzed. It was found that Dog bites caused maximum morbidity (95%). Second most common biting animal was monkey (3%), followed by cat (2%). Most bites (64.3%) were unprovoked bites by stray (64.7%) animals. In this study 57% animal bite victims were males and 39% were children in age group of 2-15 years. A high 72% of the victims had sustained category III exposure as per the WHO classification. Before coming to ARCs only 36% people had washed the wound with water/soap or water alone. Majority (42%) of the victims had applied Juice of Calotropis leaves to the wounds. The practice of wound washing at the ARC which is an important component of animal bite management was not being practiced at the centre. On day zero, along with vaccine, a dose of Tetanus Toxoid was being administered to the victims. Freeze dried Vero cell culture vaccine was used for immunizing the animal bite victims against Rabies. However, a total of four doses were being given at the centre on days 0,3,7 and 21 which does not commensurate with the National guideline for Rabies prophylaxis. On day 21, a dose was being given Instead of administering the vaccine on day 14 and 28, Rabies Immunoglobulin (RIG) was available and was being used.

Keywords: ARC, Rabies, dog bite, RIG, Vero cell culture vaccine, Calotropis

INTRODUCTION

Rabies is a zoonotic disease that transmits through animal bites. It accounts for more than 50,000 deaths every year across the world, with dog-bites being the predominant contributor. Out of the total deaths caused by rabies across the world, 60 per cent is reported from India. Most of the studies on dog-bites and rabies in India are hospital-based and limited to their management only^{1,2,3}. The figures, for prevalence of rabies, wherever available, are only estimates and thus, do not reflect the exact situation in the community. Although a number of carnivorous and bat species serve as animal reservoir, rabies in dogs is the source of 99% of human infection, and poses a potential threat to more than 3.3 billion people. It is estimated that in absence of post exposure prophylaxis, about 327,000 persons would die from rabies in Africa and Asia each and every year⁴. In India, every year approximately 1.1 to 1.5 million people receive post-exposure treatment; more than 95% of the cases are bitten by dogs. The dog

population in India is estimated to be around 25 million and most of them are not protected against rabies⁵.

The present study was carried out at the Anti Rabies Centre (ARC) of District Headquarters Hospital at Rajahmundry, Andhra Pradesh.

AIMS AND OBJECTIVES

- 1) To study the types of Animal bites and classification of bites
- 2) To study various practices of people after sustaining animal bites.
- 3) To study the functioning of Anti Rabies center

MATERIAL AND METHOD

Two sets of proformae were developed and used after field testing to interview cases of animal bites and get information on functioning of ARC. The study was

carried out at the ARC of the district headquarters hospital at Rajahmundry. The interviewers engaged in the study work were thoroughly trained in the study methodology before the start of the study itself. To maintain quality and uniformity, supervisory checks were done during the survey. A total of 100 fresh animal bite victims were interviewed (exit interview) from the ARC on the predesigned questionnaires. The study was conducted during June-July 2012. The information on the functioning of ARC was obtained from Medical Officer-in-Charge. The data were manually analyzed.

RESULTS AND DISCUSSION

TABLE 1: AGEWISE SEXWISE DISTRIBUTION OF ANIMAL BITE VICTIMS

Age	Male (%)	Female (%)	Total(%)
2-15	25	14	39
16-30	8	14	22
31-60	20	12	32
>60	4	3	7
Total	57	43	100

TABLE 2: DISTRIBUTION OF CASES AS PER TYPE OF ANIMAL INVOLVED

ANIMAL	PERCENTAGE (%)
DOG	95%
MONKEY	03%
CAT	02%
TOTAL	100%

TABLE 3: CATEGORIZATION OF BITES

CATEGORY	PERCENTAGE (%)
I	04%
II	24%
III	72%
TOTAL	100%

It may be seen from the above tables that Dog bites caused maximum morbidity (95%). Second most common biting animal was monkey (3%), followed by cat (2%). Most bites (64.3%) were unprovoked bites by stray (64.7%) animals. In this study 57% animal bite victims were males and 39% were children in age group of 2-15 years. A rather high 72% of the victims had sustained category III exposure as per the WHO classification. A similar observation was made by Ichhpujani RL et al ⁶ in an earlier multi-centric study.

TABLE 4: DURATION BETWEEN BITE AND REPORTING TO THE ANTIRABIES CENTER

DAYS	PERCENTAGE (%)
Day 0	31%
Day 1	52%
2days- 1week	15%
>1 week	02%
TOTAL	100%

TABLE 5: LOCAL PRACTICES FOR MANAGEMENT OF WOUNDS BY VICTIMS

APPLICATION TO WOUNDS	PERCENTAGE (%)
Juice of Calotropis leaves	42%
Juice of calotropis & turmeric powder	07%
Juice of cucumber leaves	05%
kerosene	02%
Turmeric powder	02%
Dettol	05%
Lemon	01 %
Zandu Balm	01 %
Tooth paste	01 %
Lime paste	01 %
Washing the wound with soap /water	36%
Not doing anything	03%

It was satisfying to note that 83% of the victims reported to the ARC on the same day of bite or on the next day which indicates that the people are aware of the horrifying consequences if not managed early.

Before coming to ARCs only 36% people had washed the wound with water/soap or water alone. Majority (42%) of the victims had applied Juice of Calotropis leaves to the wounds. Others applications included Juice of cucumber leaves, Kerosine, turmeric powder, dettol, lemon, tooth paste, Zandu balm etc. The application of these irritants is unnecessary and damaging. In an earlier multi-centric study ⁷ at Rajahmundry and five other places, the respondents had given history of application of chillies, turmeric, lime, kerosene oil and herbal paste but not the Juice of Calotropis leaves.

The practice of wound washing at the ARC which is an important component of animal bite management was not being practiced at the centre. On day zero, along with vaccine, a dose of Tetanus Toxoid was being administered to the victims. Freeze dried Vero cell

culture vaccine was being used for immunizing the animal bite victims against Rabies. A total of four doses were being given at the centre on days 0,3,7 and 21 which does not commensurate with the National Guideline for Rabies prophylaxis. On day 21, a dose was being given. Instead of administering the vaccine on days 14 and 28, Rabies Immunoglobulin (RIG) was available and was being used at the centre. In an earlier study at the same centre⁶, nervous tissue vaccine was used for Rabies prophylaxis and RIG was not available. Over years, there has been a considerable change in the functioning of the clinic.

CONCLUSION

This study provides an overview of epidemiology of animal bites. Although majority of patients are reporting to the ARC soon after sustaining the bite, there is an urgent need for Behavioral Change Communication (BCC) regarding local wound management including “do’s and don’ts”. There is also a need to create awareness regarding epidemiology and at-home and hospital management of animal bites among the general community and service providers as well.

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Retrospective and Prospective Study of Germ Cell Tumors of the Ovary in Young and Adolescent Girls

Prachi Kumar¹, Jyotsna Madan²

¹ Assistant Professor, ² Professor, Department of Pathology, Santosh Medical College, Ghaziabad.

ABSTRACT

Background and Objectives: Objective in this retrospective and prospective study was to find out the incidence of various germ cell tumors of the ovary up to 20 years of the age in the last 10 years, and to correlate clinical and pathological findings for better outcome.

Materials and Methods: Forty Two cases of ovarian germ cell tumors were studied from 2000 to 2010. Clinical data and histopathological findings were recorded.

Result: On analysis of these forty two cases, mature teratoma (57%) was the most common benign tumor and dysgerminoma (31%) was the commonest malignant tumor. Majority of the tumors were in the age group of 10-20 years.

Conclusion: Ovarian germ cell tumors are uncommon but in children and adolescent, more than 60% of ovarian neoplasms are of germ cell origin and one third are malignant. Clinical stage of the neoplasm is one of the important prognostic factors. So, early diagnosis is necessary for the better and timely management in terms of preservation of reproductive life and 5 years survival rate in cases of malignant tumors.

Keywords: Germ cell tumors, ovary, young and adolescent girls

INTRODUCTION

Ovarian neoplasms are the most common form of gynecological neoplasms found in children. Histologically, germ cell tumors are more common in comparison to surface epithelial- stromal tumors in childhood and adolescent.

Germ cell tumors of the ovary are composed of a number of histologically different tumor types and include all the neoplasms considered to be ultimately derived from the primitive germ cells of the embryonic gonads.^[1] They are special type of neoplasms due to their histology, age of presentation, prognosis and treatment.

Germ cell tumors constitute the second largest group of ovarian neoplasms (approximately 20%) after the common surface epithelial stromal tumors. But during the first two decades of life, more than 60% of ovarian neoplasms are of germ cell origin.^[2] They are highly curable malignancies when detected in the early stages and have an excellent survival outcomes and good quality of reproductive life with conservative or fertility preserving surgery and chemotherapy. Early diagnosis is difficult because of two major reasons. 1) There are no

specific symptoms in early stages. 2) Young girls generally avoid visiting gynecologists. Ultrasonography, computerized tomography and estimation of serum markers like alpha-fetoprotein and beta subunit of human chorionic gonadotropin are helpful to indicate the type of tumor. But prognosis and choice of treatment depends on histological type and stage of the tumor.

The various forms of germ cell tumors are often intermixed; hence careful gross examination and judicious sampling for microscopic study are necessary to achieve the complete diagnosis that is prerequisite for optimal therapy.

So, the present study was done to correlate the age incidence, clinical presentation, frequency distribution of various neoplasms and the patterns of all types of germ cell tumors.

MATERIAL AND METHOD

Forty two cases of ovarian tumors were studied from 2000 to 2010 in the department of Pathology, Santosh Medical College, Ghaziabad. In the retrospective study all the slides and blocks with a histopathological

diagnosis of germ cell tumors were studied. In the prospective study, all oophorectomy specimens received in the department with the clinical impression of germ cell tumors were studied.

The following particulars were recorded for each case. Age, symptoms, duration of symptoms, clinical diagnosis, gross characteristics of the specimen and the histopathological features.

Gross examination was carefully done and pieces taken from appropriate site were processed routinely. Sections were stained using haematoxylin and eosin stain and examined microscopically to establish histopathological diagnosis. Germ cell tumors were classified according to WHO classification. [3]

RESULTS

A total of 42 cases of germ cell tumors of the ovary in girls up to 20 years of age were studied. Of these cases, the most common histological type was mature

teratoma. There were 24 cases (57.14%) of mature cystic teratoma. [Fig.1] The next common group of tumors was dysgerminoma [Fig.2]. A total of 13 cases (31%) of dysgerminoma were encountered. There were 3 cases (7.14%) of yolk sac tumor [Fig.3] and 2 cases (4.7%) of immature teratoma. [Fig.4] [Table 1].

Table 1: Distribution of different histological subtypes of germ cell tumors

S.No	Nature of tumor	Number of cases	%
1.	Mature Teratoma	24	57.14
2.	Dysgerminoma	13	30.95
3.	Yolk sac tumor	3	7.14
4.	Immature Teratoma	2	4.76
	Total	42	

Table 2 shows the age incidence of different germ cell tumors. Majority of the tumors whether benign or malignant were seen in the age group 10-20 years (35 cases) i.e. 83%. Only seven cases (17%) were seen in the age group from 0 to 10 years.

Table 2: Age incidence of different germ cell tumors

Age group (years)	Mature Teratoma	Dysgerminoma	Yolk sac tumor	Immature Teratoma	%
0-10	4	1	1	1	16.6
10-20	20	12	2	1	83.3

As seen in Table 3 most cases i.e. 25 cases (60%) presented with abdominal mass, followed by pain abdomen, nausea and vomiting. Amenorrhea was observed only in 5 cases.

Table 3: Modes of presentation

S.No	Symptoms	MT*	DYG [†]	YST [‡]	IT [§]	%
1.	Abdominal mass	14	8	2	1	59.5
2.	Pain/Nausea/Vomiting	6	4	1	1	28.5
3.	Amenorrhea / Primary infertility	4	1	-	-	11.9

*Mature Teratoma, †Dysgerminoma, ‡Yolk Sac Tumor, §immature Teratoma

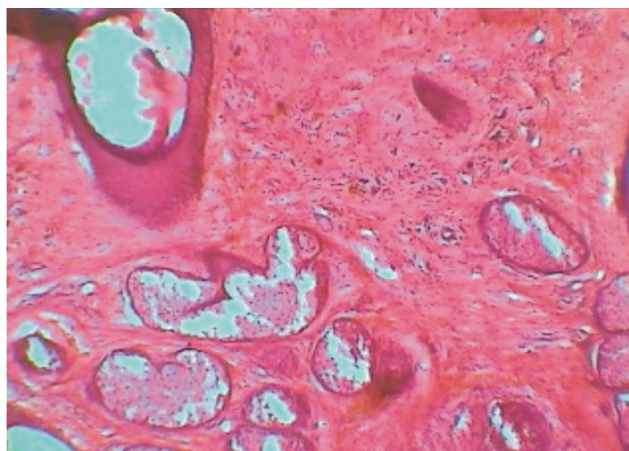


Fig 1: Mature teratoma of ovary showing skin adnexa (H and E, x100)

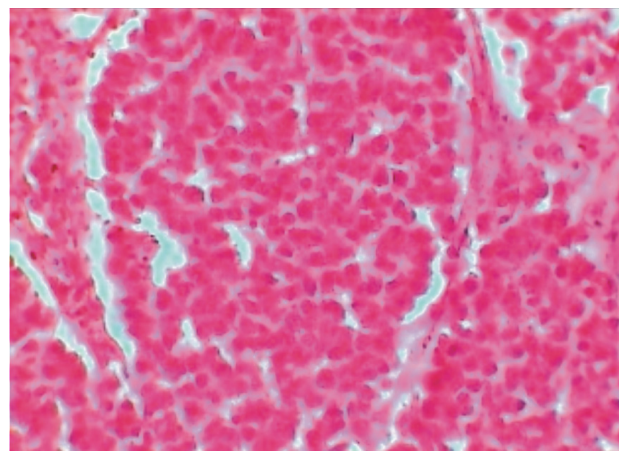


Fig 2: Dysgerminoma: Tumor cells having clear cytoplasm, central nucleus & lymphocytes in the stroma (H and E, x400)

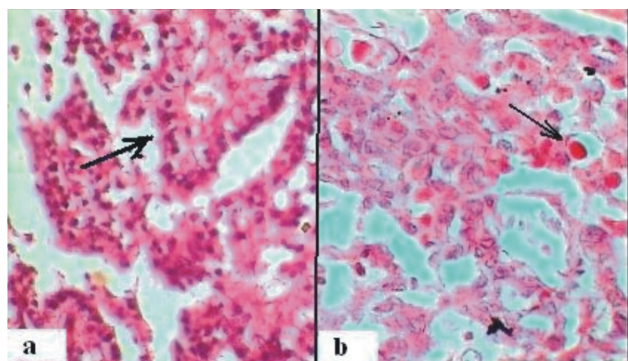


Fig.3: Yolk sac tumour: (a) Schiller-Duval bodies(arrow). (b) hyaline bodies(arrow)(H and E, x400)

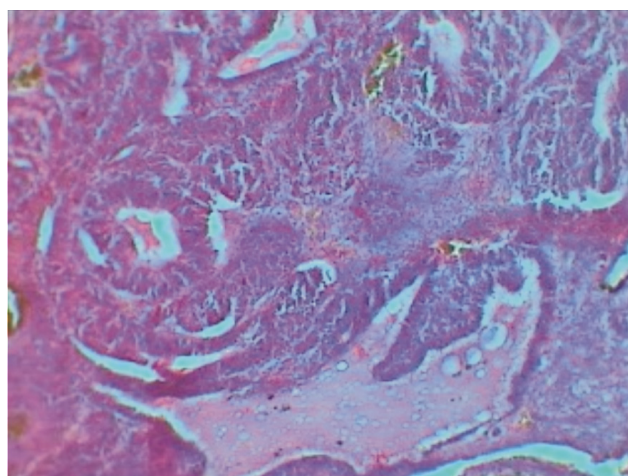


Fig.4: Immature Teratoma showing immature cartilage and neuroepithelial tubules(H and E,x100)

DISCUSSION

Mature teratoma (MT) is the commonest form of germ cell tumors in adults as well as in children. In the present study also incidence of mature teratoma was highest (57.14%) but the incidence is low in comparison to the other studies. Panteli et al (2009) ^[4] reported incidence for MT as 72.5% and Rzepka GI et al (2003) ^[5] reported even higher incidence of mature teratoma as 84%. But Nirmal K Bhattacharya et al (2010) ^[6] reported almost similar incidence of MT as 62%.

The second most common germ cell tumor observed in our study was dysgerminoma(30.95%), and it was the most common malignant germ cell tumor. Biswajit et al(2010) ^[7] also reported the similar findings as 27%. But they reported mixed germ cell tumor(32%) as the most common malignant germ cell tumor. Panteli et al(2009) reported only 5% cases of dysgerminoma. Studies have shown that dysgerminoma constitutes 5% to 10% of all ovarian cancers in the first two decades of life.^[2] The incidence of other germ cell tumors like yolk

sac tumor and immature teratoma was quite low in our study. In various published studies, the incidence of different histological subtypes of germ cell tumors is different.^[4,5,7,8] Possible reason for this variation could be demographic as observed by Mohammed A et al.^[8] They revealed that Burkitt's lymphoma is the most common malignant childhood neoplasm of the ovary in northern Nigeria, possibly because of relatively high incidence of Burkitt's lymphoma in African children. Regarding age group in our study, 35 cases (83.3%) were in 10-20 years of age which is in accordance with other published series by Panteli et al ^[4], and Nirmal et al ^[5]. In 0-10 years age group mature teratoma is the commonest. This is compatible with the findings that mature teratoma has wider age distribution.

Clinically most of our cases (59.5%) presented with abdominal mass followed by pain abdomen. Similar findings were recorded by Nirmal et al (2010).^[5]

Fortunately none of our case presented with complications like rupture or torsion of the neoplasm.

CONCLUSION

Germ cell tumors of the ovary are uncommon but important in clinical practice because most of these neoplasms occur in young girls and one-third of these neoplasms are malignant. As they are highly curable malignancies if diagnosed and treated early. Hence, the emphasis is on early diagnosis for better and timely management in terms of preservation of reproductive life and 5 year survival rate in case of malignant tumor.

Conflict of Interest - None

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Study of Diurnal Variation of Pulmonary Function Test

Prasad B K¹, Ashika B L²

¹Assistant Professor, Dept of Physiology, SSIMS & RC Davangere, ²II Phase MBBS, SSIMS & RC Davangere, Karnataka

ABSTRACT

Pulmonary function has circadian rhythm in humans proven in diseased in conditions. These variations will contribute to better understanding the relationship between biorhythms and lung physiology for better management of pulmonary diseases. To study PFT in medical students during different time of the day and to study whether there is diurnal variation in PFT. The I MBBS students chosen as subjects were apparently normal and non-smokers. The study group included 113 students. They underwent PFT during different time of the day, i.e., at 6am, 11am, 4pm and 9pm. PFT was done using computerized Spirometer and the parameters studied were FEV₁, FVC, FEV₁/FVC, PEF, FEF_{25-75%} and FEF_{2-1.2L}. The data was tabulated and statistically analyzed. There were changes in all the PFT parameters recorded during different time of the same day. Mean of FEV₁ and FVC were highest in the recording taken at 9:00pm. % change noted was 1.74% and 1.32% respectively, when compared to the recording at 6:00am. Mean of FEV₁/FVC ratio also showed diurnal rhythm with highest % at 11:00am and lowest % at 6:00am. The % change noted was 0.76%. Mean of PEF, FEF_{25-75%} and FEF_{2-1.2L} showed diurnal rhythm. They were high in the recording done at 4:00pm and low in the recording done at 6:00am. % change noted in PEF, FEF_{25-75%} and FEF_{2-1.2L} were 2.25%, 3.66% and 2.08% respectively. % change noted for each parameter was statistically not significant. The diurnal variation in PFT parameters is noted in healthy subjects. The % change noted is minimal in young healthy individuals. This diurnal rhythm amplitude increase in asthma and bronchitis patients.

Keywords: PFT, Computerized Spirometer, Diurnal Variation

INTRODUCTION

The 24h cyclical patterns of physiological functions called Circadian rhythms, have become an area of interest in clinically oriented, as well basic research. There are many biologic functions that exhibit variability over 24-h periods. Airway function is one among them. These circadian rhythms are orchestrated by the "circadian clock", located in the suprachiasmatic nucleus of the hypothalamus^{1,2} and regulated by the hypothalamic-pituitary axis, the autonomic nervous system and clock proteins, which form regulatory feedback loops^{3,4}.

The cyclical patterns are attributed to different biological requirements of daytime activities and nighttime sleep.

The existence of a circadian rhythm in lung function is well recognized⁵. This variability has been found to be responsible for worsening of lung function at night in patients with nocturnal asthma and, to a lesser extent, with COPD⁶⁻⁹. As nocturnal asthma is common and troublesome^{6,7,10}, circadian variation in airway function has been of considerable interest in respiratory

medicine. It has been recognized that diurnal variation in airway caliber occurs in healthy subjects as well¹¹⁻¹³. In these subjects, a variation of about 4% of the average early morning level has been found in the FEV₁¹¹, and of about 8% of the average level in the peak expiratory flow (PEF)¹².

Despite the generally acknowledged role of circadian variation in lung function, in follow-up studies and, least of all, in epidemiologic studies of the general population, this variation is frequently not accounted for by study design or by taking time of measurement into account. The knowledge of diurnal fluctuations in pulmonary function is important in order to better understand the impact of biorhythms on pulmonary physiology and to optimize the clinical management of pulmonary diseases. The purpose of this study was to note and estimate the magnitude of diurnal variability in lung function between 6:00A.M. and 9:00P.M. on normal survey days, in young healthy individuals. The hypothesis tested in this study is "there is diurnal variation in lung function in normal individuals".

MATERIALS AND METHOD

The study is performed on I MBBS students of a medical college who hail from different places of the country. Following are the inclusion criteria for selection of subjects for this study.

Healthy subjects with

- No previous history of upper respiratory tract infection within 3 months.
- No history of asthma or bronchitis in the subjects as well in their family
- No other clinically detected medical illness
- No history of smoking

Subjects selected based on the above inclusion criteria. After selection of subjects, their socio demographic data was recorded. Subjects underwent general physical examination and thorough clinical examination of respiratory system to rule out significant pre existing pathology which may influence the study parameters. After ensuring that inclusion criteria mentioned above are met, and after obtaining written informed consent from willing subjects, the final sample was formed.

Subjects in the sample thus selected were of both sexes. PFT was assessed in both sexes. The test was done on a normal survey day. Subjects' physical characteristics like height and weight was measured and recorded. Body surface area was calculated for each subject, by the software incorporated in the spirometer.

Lung function parameters, i.e, FEV₁, FVC, FEV₁/FVC, FEV₁, PEF, FEF_{25-75%} and FEF_{2-1.2L} were measured using the below described instrument, by the below described method, and recorded 4 times a day, i.e, at 6:00am, 11:00am, 4:00pm and 9:00pm.

The spirometer used for this study is RMS Medspiror SPC WI 1.02 and the transducer used for recording is Model no. A00N_2003.

After selection of subjects, their socio demographic data will be recorded. Subjects will undergo general physical examination and thorough clinical examination of respiratory system to rule out significant pre existing pathology which may influence the study parameters. After ensuring that inclusion criteria mentioned above are met, and after obtaining written informed consent from willing subjects, the final sample will be formed.

Subjects in the sample thus selected are of both sexes. PFT will be assessed in both sexes. The test will be done on a normal survey day. Subjects' physical characteristics like height and weight will be measured and recorded. Body surface area will be calculated for each subject, by the software incorporated in the spirometer.

Lung function parameters, i.e, FEV₁, FVC, FEV₁/FVC, PEF, FEF_{25-75%} and FEF_{2-1.2L} will be measured using the above described instrument, by the above described method, and recorded 4 times a day, i.e, at 6:00am, 11:00am, 4:00pm and 9:00pm. The predicted values for FEV₁, FVC, FEV₁/FVC, PEF, FEF_{25-75%} and FEF_{2-1.2L} for each subject are obtained from pre-determined values for age, stature and race incorporated in the Spirometer software.

The data will be entered in the proforma and tabulated. Suitable statistical methods are applied to analyze the data, such as, mean, standard deviation, etc.

OBSERVATION AND RESULTS

The present study is a case-control study design comparing the 1st recording with the other 3 recordings of the subjects selected. Out of 150 I MBBS students examined, 113 were selected for the study, satisfying all the inclusion criteria.

The parameters studied are the pulmonary function test, i.e. FEV₁, FVC, FEV₁/FVC, PEFR, FEF_{25-75%} and FEF_{2-1.2L}.

The data was subjected to appropriate statistical treatment. The following are the statistical methods applied in this study.

Statistical Methods^{20, 21}: Descriptive statistical analysis has been carried out in the present study. Repeated measures ANCOVA test has been used to find the significance of homogeneity of study characteristics between two recordings of the subjects. ANCOVA test has been used to find the significance of difference between two recordings.

Statistical software: The Statistical software namely SPSS 15.0, Stata 8.0, MedCalc 9.0.1 and Systat 11.0 were used for the analysis of the data and Microsoft word and Excel have been used to generate graphs, tables etc.

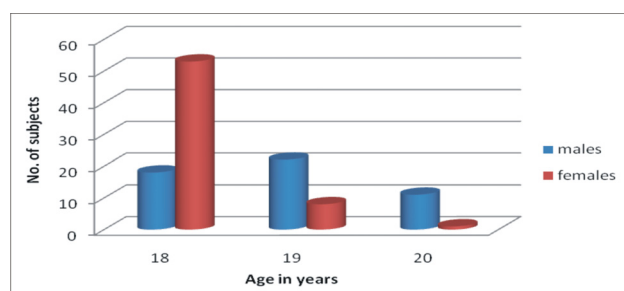
Study design: This is a Case-control study with 113 subjects selected. 4 PFT recordings were taken at

different time on the same day and 1st recording was compared with the other 3.

Table 1: Age distribution of subjects studied

Age(years)	Males	Females	Total
18	18	53	71
19	22	8	30
20	11	1	12
Total	51	62	113

Graph 1: Age distribution of subjects studied



Age distribution of subjects included in the study is depicted in table 2 and graph 1.

Table 2: Assessment of PFT parameters of all the recordings

	No.	FVC(in Ltr)		FEV ₁ (in Ltr)		FEV ₁ /FVC(%)		PEFR(in Ltr)		FEF _{25-75%} (in Ltr)		FEF _{0.2-1.2L} (in Ltr)	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Rec 1	113	2.42	0.63	2.29	0.53	95.33	5.71	4.80	1.40	3.14	0.84	3.99	1.25
Rec 2	113	2.43	0.63	2.33	0.57	96.05	5.01	4.86	1.51	3.22	0.87	4.03	1.30
Rec 3	113	2.45	0.65	2.33	0.57	95.60	5.48	4.91	1.46	3.25	0.91	4.07	1.32
Rec 4	113	2.40	0.64	2.28	0.56	95.56	5.61	4.83	1.58	3.15	0.93	4.01	1.43

In table 2 the mean of various parameters studied is analysed. FEV₁/FVC is above 80% in all the recordings.

Table 3: Comparison among different time of assessment of Mean FEV₁

FEV ₁	Mean (in Litres)	Mean difference with Rec1(in Litres)	% Change	p* Value, sig
Rec 1	2.29	-	-	0.38 Not Sig
Rec 2	2.33	0.04	1.61	
Rec 3	2.33	0.04	1.74	
Rec 4	2.28	-0.01	-0.35	

Table 4: Comparison among different time of assessment of Mean FVC

FVC	Mean (in Litres)	Mean difference with Rec1 (in Litres)	% Change	p* Value, sig
Rec 1	2.42	-	-	0.63 Not Sig
Rec 2	2.43	0.01	0.57	
Rec 3	2.45	0.03	1.32	
Rec 4	2.40	-0.02	-0.68	

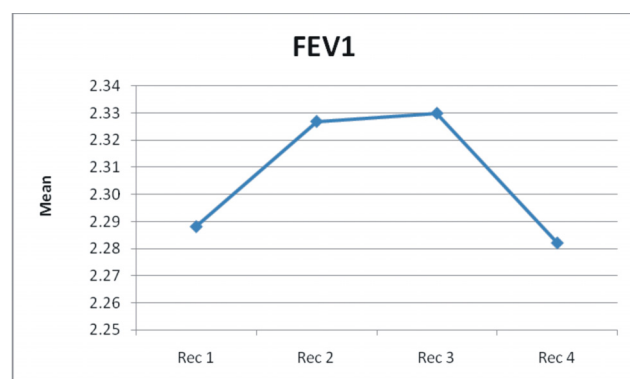
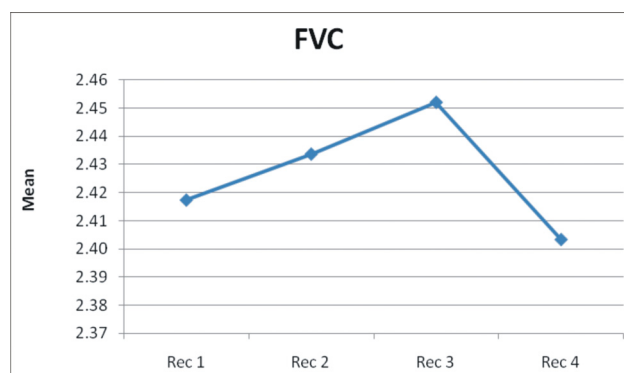


Fig. 2. Comparison among different time of assessment of Mean FEV₁

Mean of FEV₁ is assessed in table 3 and graph 2. FEV₁ is highest in recording 3 and lowest in recording 4. The change in FEV₁ noted is statistically not significant. But 1.74% change is noted between recording 1 and recording 3.

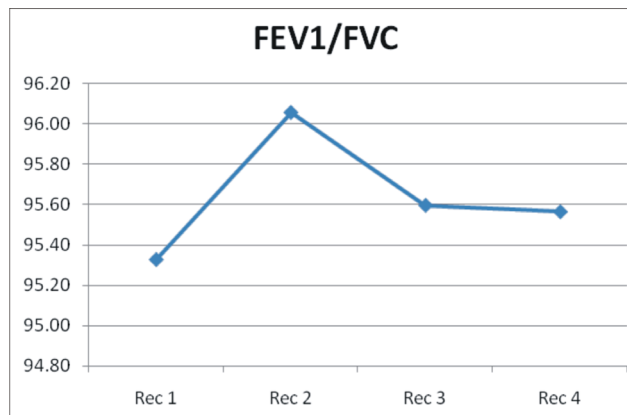
Graph 3: Comparison among different time of assessment of Mean FVC



Mean of FVC is assessed in table 4 and graph 23. FVC is highest in recording 3 and lowest in recording 4. The change in FVC noted is statistically not significant. But 1.32% change is noted between recording 1 and recording 3.

Table 5: Comparison among different time of assessment of Mean FEV₁/FVC

FEV ₁ /FVC	Mean (%)	Mean difference with Rec1	% Change	p* Value, sig
Rec 1	95.33	-	-	0.38 Not Sig
Rec 2	96.05	0.72	0.76	
Rec 3	95.60	0.27	0.28	
Rec 4	95.56	0.23	0.25	

Graph 4: Comparison among different time of assessment of Mean FEV₁/FVC

Mean of FEV₁/FVC is assessed in table 4 and graph 3. FEV₁/FVC is highest in recording 2 and lowest in recording 1. The change in FEV₁/FVC noted is statistically not significant. But 0.76% change is noted between recording 1 and recording 2.

Table 6: Comparison among different time of assessment of Mean PEFR

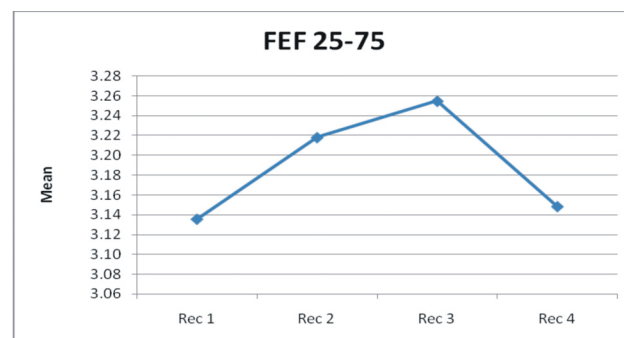
FEV ₁ /FVC	Mean (in Litres)	Mean difference with Rec1 (in Litres)	% Change	p* Value, sig
Rec 1	4.80	-	-	0.74 Not Sig
Rec 2	4.86	0.06	1.31	
Rec 3	4.91	0.11	2.25	
Rec 4	4.83	0.03	0.52	

Graph 5: Comparison among different time of assessment of Mean PEFR

Mean of PEFR is assessed in table 4 and graph 3. PEFR is highest in recording 3 and lowest in recording 1. The change in PEFR noted is statistically not significant. But 2.25% change is noted between recording 1 and recording 3.

Table 7: Comparison among different time of assessment of Mean FEF_{25-75%}

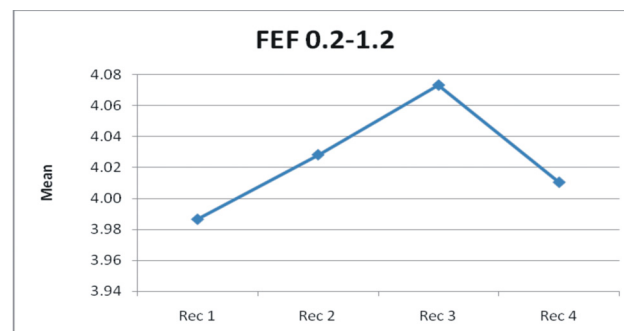
FEF _{25-75%}	Mean (in Litres)	Mean difference with Rec1 (in Litres)	% Change	p* Value, sig
Rec 1	3.14	-	-	0.12 Not Sig
Rec 2	3.22	0.08	2.48	
Rec 3	3.25	0.11	3.66	
Rec 4	3.15	0.01	0.26	

Graph 6: Comparison among different time of assessment of Mean FEF_{25-75%}

Mean of FEF_{25-75%} is assessed in table 4 and graph 3. FEF_{25-75%} is highest in recording 3 and lowest in recording 1. The change in FEF_{25-75%} noted is statistically not significant. But 3.66% change is noted between recording 1 and recording 3.

Table 8: Comparison among different time of assessment of Mean FEF_{0.2-1.2L}

FEF _{0.2-1.2L}	Mean (in Litres)	Mean difference with Rec1 (in Litres)	% Change	p* Value, sig
Rec 1	3.99	-	-	0.78 Not Sig
Rec 2	4.03	0.04	0.96	
Rec 3	4.07	0.08	2.08	
Rec 4	4.01	0.02	0.51	

Graph 7: Comparison among different time of assessment of Mean FEF_{0.2-1.2L}

Mean of $FEF_{2-1.2L}$ is assessed in table 4 and graph 3. $FEF_{2-1.2L}$ is highest in recording 3 and lowest in recording 1. The change in $FEF_{2-1.2L}$ noted is statistically not significant. But 2.08% change is noted between recording 1 and recording 3.

DISCUSSION

The present study is a cross sectional study conducted over IMBBS students of SSIMS&RC during March to May 2010. The subjects selected satisfied all the inclusion criteria. Computerized spirometer was used to assess PFT.

The subjects selected were aged between 18 and 20yr and were healthy. FEV_1 /FVC ratio of all the subjects selected was above 80% in all the four recordings taken at 6:00am, 11:00am, 4:00pm and 9:00pm. The pattern of diurnal variation of PFT parameters was analyzed using various statistical methods.

On analyzing the results it was noted that mean of FEV_1 and FVC was highest in the recording taken at 9:00pm. The % change noted though statistically not significant there is change of 1.74% in FEV_1 and 1.32% in FVC when compared with the recording taken at 6:00am. The results are in accordance with the studies done by Medaror et.al¹⁴, Borsboom et.al¹⁶, Larsson et.al¹⁸, Patil et.al¹⁷ and Hurby.J & Butler.J¹⁹.

Mean of FEV_1 /FVC ratio also showed diurnal rhythm with highest % at 11:00am and lowest % at 6:00am. The % change noted was 0.76%. the change noted is statistically not significant.

Mean of PEFR, $FEF_{25-75\%}$ and $FEF_{0.2-1.2L}$ showed diurnal rhythm. They were high in the recording done at 4:00pm and low in the recording done at 6:00am. The change noted though statistically not significant, % change noted in PEFR, $FEF_{25-75\%}$ and $FEF_{2-1.2L}$ were 2.25%, 3.66% and 2.08% respectively. The results are in accordance with the studies done by Medaror et.al¹⁴, Aggarwal et.al¹⁵, Borsboom et.al¹⁶ and Patil et.al¹⁷.

Though the diurnal rhythm noted in PFT parameters in this study, conducted on young healthy subjects, is not statistically significant there is some change noted with respect to time of recording. Some of the earlier studies noted statistically significant change in PFT parameters with respect to time whereas in other studies the change noted is not statistically significant.

The subjects selected for this study are aged between 18 and 20yr, non-smokers and healthy on clinical

examination. All the confounding factors have been considered in this study and may be the reason for statistically insignificant change noted.

CONCLUSION

The diurnal variation in PFT parameters is noted in healthy subjects. FEV_1 and FVC rise in afternoon and lower in night. FEV_1 /FVC ratio rise in noon. PEFR, $FEF_{25-75\%}$ and $FEF_{2-1.2L}$ rise in afternoon and lower early morning. The % change noted is statistically not significant in young healthy individuals. This diurnal rhythm amplitude increase in asthma and bronchitis patients.

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Saving Babies and Mothers - the Tamil Nadu Model

Jayashree¹, Dope Santoshkumar², Prashant V Solanke³

¹Associate Professor, Community Medicine Department, Sree Mookambika Institute of Medical Sciences, Kulasekharam, Kanyakumari District, Tamil Nadu, ²Assistant Professor, Dept. of Anatomy, Government Medical College, Latur, Maharashtra, ³Assistant Professor, Dept. of Community Medicine, Sree Mookambika Institute of Medical science, Kulasekharam, Kanyakumari District, Tamil Nadu

ABSTRACT

Back ground: Maternal Mortality Ratio (MMR) and infant Mortality Rate (IMR) are very sensitive indicators of the MCH care and the living standards of a community. Currently, the MMR in India is 230 per 100,000 live births and IMR is 53 per 1000 live births. The Reproductive and Child Health (RCH) Programme was launched on 15 October 1997. This include a package of services for women and children². RCH Phase II was launched on 1 April 2005 with a vision to bring about outputs as envisaged in the Tenth Plan, National Population Policy (2000), National Health Policy (2002), Millennium Development Goals (MDG) 2005 etc. Minimising regional variations in the areas of reproductive health and population stabilization is aimed at. The National Rural Health Mission (NRHM) which was implemented from 12 April 2005 for a period of 7 years (2005-2012) is an omnibus broad band programme integrating all the vertical health programmes of the Department of Health & Family Welfare including RCH Programme II, various National Programmes for disease control and various Externally Aided Projects. (EAP)³. This is a national effort at effective health care through a range of interventions. Reduction of maternal and infant morbidity and mortality is of prime concern. As a result, the states are striving to reduce deaths of mothers and infants.

Result: As per Millennium Development Goals, Tamil Nadu achieved Infant mortality rate of 28 per 1000 live births to be achieved by 2015 gives as goal No : 4

Conclusion: The Tamil Nadu has brought great changes in field of child & motherhood. This is done with applying principle of primary health care with multidimensional & comprehensive effort.

Keywords: Save Babies & Mother, Tamil Nadu Model, Infant Mortality Rate, Mother Mortality Rate

INTRODUCTION

The health of mothers and children are of utmost importance in determining the health status of a community. 57% of India's population is formed by women in the reproductive age group (15-44 years) and children below 15 years¹. They are a priority group as they are more vulnerable to ill health when compared to the general population. The World Health Day theme for 2005 was "Make every mother and child count".

HEALTH FOR ALL CONCEPT

In the face of the huge gap in the health status of the different populations of the world, the World Health Assembly put forward the Health for All concept in May

1977 because the peoples of the world have equal claim to health⁴. Health should be brought within the reach of everyone in the community. The removal of conditions which act as obstacles to the attainment of health is focused on. Primary Health Care is the means by which this can be achieved. Education, awareness, Government policies, implementation of National Programmes, utilization of services, real involvement of the community, social development, self respect, awareness about one's rights – all are significant^{5,6}.

The Tamil Nadu scenario

Tamil Nadu is a southern state with some demographic characteristics as follows⁷:-

Area-130058 sq. km

Number of districts- 32

Population – 62,405,679 (7th most populous in India)

Sex Ratio – 987

Dalits – 38%

Per capita income – Rs. 43, 000

Literacy – 73.45% , Female literacy- -64.55%

BPL families – 27.7%

Work participation rate of women – 31.32 %

Human Development Index – 0.736

Number of PHCs – 1533.

This state has brought about a substantial reduction in the maternal and infant mortality rate. From 165 per 100,000 live births in 1999, the MMR has come down to 111 by 2008. The IMR has fallen to 28 per 1000 live births 2009. The National rates for MMR and IMR are at present 230 and 53 respectively⁸. The World Bank has praised the efforts and achievements of the state of Tamil Nadu on the maternal and child health front⁹.

How this was made possible?

We can see that efforts are made on all fronts – a real multipronged attack on the factors claiming the lives of mothers and babies is going on.

Education: As already mentioned, the female literacy rate in this state is 64.55% as compared to that at the National rate of 54.28 %. Free and compulsory education up to the age of 14 years is given. Free education up to the higher secondary stage is practiced by the state.

Mid Day Meal Scheme started in the 1960s has also been helpful. This is given up to standard X and is the best known in the country. Deworming of these children is also done on a regular basis under this programme. As a result, children esp. girls of poor families are attending schools regularly. 100% Gross Enrolment Ratio is seen in primary and upper primary education^{10, 11}.

Moovalur Ramamirtham Ammaiyar Ninavu Marriage Assistance Scheme offers Rs. 24,000 for young women at their marriage provided they have an education up to standard X¹².

It is well known that female literacy rate is a significant determinant of the health status of a community.

Gainful employment of women

Female work participation rate in Tamil Nadu is 31.32 % as compared to the National rate of 25.68%⁷. Financial independence confers a higher status and decision making power to women which will reflect on their choices with respect to higher age at marriage, small family norm and good decision making in health and allied matters.

Poverty alleviation

Rice at Rs. 2 is being distributed in the state from 03-06-2006 through the public Distribution System. Antyodaya Yojana Scheme ensures food security for the poorest of the poor. 35 kilograms of rice at a rate of Rs. 2 per kg, sugar wheat, kerosene etc are also distributed at highly subsidized rates^{13,14}.

Mahatma Gandhi National Rural Employment Guarantee Scheme (MNGREGS) – Tamil Nadu is one of the states with good performance¹⁵.

Health Care Services

Health Centre's – There is a well established network of health centre's throughout the state, especially the rural areas. 1533 PHCs with a population of 30,000 – 40,000 each form the backbone of Health Services. The local administration is made accountable for the quality of services in the PHCs. Doctors, nurses and health workers are given training periodically. The staff nurse is on call 24 hours. In addition to antenatal care, immunizations etc, normal deliveries are conducted in the PHCs. Caesarean sections if needed are done in district hospitals, Comprehensive Emergency Obstetric & Newborn Care Center (CEmONCs) etc.

Reproductive and child health (RCH) & National rural health mission (NRHM) – Like the other states, NRHM and RCH Phase II are being implemented here also. In addition to the maternal components, child components of RCH like immunization (83%)¹⁶, Vitamin A Prophylaxis¹⁷, Acute Respiratory Infection Control, Diarrhoea Control and infant feeding are also taken care of in a commendable manner. From 2005 April 12 NRHM has also been launched. Along with the existing personnel, ASHAs are also doing work which creates awareness about health. The Janani Suraksha Yojana which was launched in April 2005 is of benefit to women above 19 years of BPL families and Dalits

families of the state. The women are provided with cash assistance along with institutional care during antenatal, natal and immediate postnatal period. The Vandemataram Scheme is also operating, which is an example of bringing the private sector also into the efforts for improving the maternal and child health status.

The Integrated Child Development Scheme, under the Social Welfare Department also contributes. An Anganwadi Worker is given Rs. 5000 per month and a helper Rs. 2300 per month. All these incentives motivate the workforce and a trust in the government is built up¹⁸.

The spectacular results are believed to be due to the establishment of Comprehensive Emergency Obstetric & Newborn Care Center (CEmONCs) across the state. This is supported by the Tamil Nadu Health System Project. 125 CEmONCs are functioning in the state. The aim is to provide one centre for every 5 lakh population. No woman should have to spend more than 15 minutes to reach a centre. These centres have got 24 hour obstetric and pediatric casualty, labour room, antenatal ward, postnatal ward and post operative wards. Blood bank, Neonatal ICU, Laboratory, diagnostic and scan facilities are also provided. Infection prevention is a priority here. Proper management of biomedical wastes is done. Round the clock service from trained staff is also available¹⁴.

Major hurdles in getting help in an emergency to avoid maternal and child deaths has been found at three levels. – Delay at family level, delay in getting transport, and delay in getting care even after reaching a health care centre.

Family – For removing the delay at this level, several awareness programmes to make the family members realize the importance of emergency care and institutional deliveries are going on. ASHAs and other field workers also work for this.

Transport – “108 ambulances” are rendering their free service to users like pregnant mothers. There are such 385 ambulances. This is as part of GVK emergency management and research

Institute. The ambulances reach the beneficiaries in 15-20 minutes’ time¹⁹.

Service – In the Health Centers and especially the CEmONCs, 24 hour expert and efficient service is available. As a result, almost 95% of the SC/ST population is utilizing institutional delivery facilities¹⁴.

Health Insurance

There is Chief Minister Kalainger’s insurance scheme for life saving treatments. This includes maternity care; care in specialist centre’s and in private hospitals also.

Social development and cultural awakening

The high literacy, awareness has also resulted in a sense of self identity and a belief in the right to demand services in the common man.

THE RESULT

The Millennium Development Goals to be achieved by 2015 gives as goal No : 4 & goal No: 5 an IMR of <30 per 1000 live births and a MMR of 100 per 1000, 000 live births. The Tamil Nadu value of 28 and 111 are comparable to this.

CONCLUSION

The Tamil Nadu experience is a classic example of how multidimensional and comprehensive efforts can bring about spectacular changes. The same could be applied to populations of other regions also with appropriate modifications if necessary.

All the principles of Primary Health Care are applied. The results achieved are due to co-ordination of different sectors, involvement of people, equitable distribution, political will and an attempt at inclusive development.

RECOMMENDATION

- 1) Other states should also use principles of primary health care in proper way
- 2) Literacy rate should be increased
- 3) Employment of women should be encourage
- 4) Health insurance should be covered.

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An Analytical Study on Variation in Diaphragm Position and Shape (Costo - Phrenic Angle) in COPD Patients

M Premkumar¹, K Manivannan², Pradip N Modi³

¹Assistant Professor, HOD, Department of Cardio Respiratory Physiotherapy, K J Pandya College of Physiotherapy, Sumandeep Vidyapeeth, Piparia, Waghodia Taluk, Vadodara, Gujarat, ²Assistant Professor, KJPCP, ³BPT internee, KJPCP

ABSTRACT

Background: Increased airflow resistance, hyperinflation, air trapping are the main pathophysiological features of COPD. A more rigorous of the normal variation in diaphragm position and shape, based on easily recognised anatomic landmarks, and analysis of factors that might contribute to this variation, such as age and weight, may provide a more reliable basis for this assessment.

Purpose of the study: To find out the variation in diaphragm position and shape (costo - phrenic angle) in COPD patients.

Method: 30 COPD subjects were selected randomly from Dhiraj general hospital, Vadodara, Gujarat with 30 counterpart normal subjects with same age group and both sex. Their PA chest radiographs had been taken for the measurement of costo - phrenic angle and it was measured. Costo - phrenic angle of COPD subjects was compared with normal subjects. Results: p values were get through analysis of data by using independent sample 't' test with spss version 11.0. the values were $p < 0.000$ for right side and $p < 0.258$ for left side when costo - phrenic angle of COPD was compared with normal subjects.

Conclusion: There were variation in position and shape of diaphragm in COPD subjects to normal subjects by means of high level significance in same age group.

INTRODUCTION

Increased airflow resistance, hyperinflation, and air trapping are the main pathophysiological features of Chronic Obstructive Pulmonary Disease (COPD) ¹. Hyperinflation correlates directly with an increased resting pleural pressure, and is associated with decreased diaphragm activation and increased expiratory muscle recruitment ². Hyperinflation also affects respiratory mechanics by passively shortening the operating length of the diaphragm and changing its linkage with the rib cage, thus placing the diaphragm at mechanical disadvantage ³. This affects respiratory muscle strength ^{4, 5} and volume displacement, thus contributing to an impairment of exercise tolerance. The mass, thickness, and area of the diaphragm are also altered in COPD ⁶, as a result of general skeletal muscle wasting commonly seen in these patients. These morphometric changes in the diaphragm, and especially in its opening length, have been postulated to contribute to the reduced inspiratory muscle training ^{5,7,8}.

When interpreting chest radiographs, the position and shape of the diaphragm are routinely used to evaluate whether the lungs are underinflated, as with inadequate inspiratory effort or restrictive lung disease, or overinflated, as in emphysema or other obstructive lung diseases. Conventional teaching that the normal position of the right hemi diaphragm projects at about the anterior sixth rib ^{9,10} appears to originate from a single study ¹¹. This and other previous studies that have included data on the position and shape of the diaphragm in normal subjects have been limited by lack of data confirming normal pulmonary function, ^{11,12,13} by subjective or roughly defined objective criteria to determine diaphragm position and shape, ^{11,12,13,14,15,16,17} or by relatively small sizes. ^{12, 18, 19,20,21,22}

A more rigorous definition of the normal variation in diaphragm position and shape, based on easily recognized anatomic landmarks, and analysis of factors that might contribute to this variation, such as age and weight, may provide a more reliable basis for

this assessment. Therefore, we conducted this study for two reasons: (1) to describe the spectrum of diaphragm position and shape on chest radiographs obtained in patients with normal pulmonary function, and (2) to identify the relationship of diaphragm position and shape to demographic variables, radiographic thoracic dimensions, and smoking history.

It is well accepted that the diaphragm is the principal generator of V_T in normal subjects at rest. However, it is generally believed that in extreme hyperinflation the shortening capacity of the diaphragm, and hence its ability to contribute to V_T , would be compromised.¹⁰ Contradicting that view, it has recently been shown using fluoroscopy that diaphragm motion during tidal breathing is similar in patients with COPD and control subjects³⁹, but diaphragm dimensions were not measured in that study. There have been several reports comparing diaphragm length measurements in control subjects and patients with COPD. These studies have relied on imaging using either chest radiographs^{3,40,41} or CT scans³⁴ to obtain static lengths of the diaphragm at specific lung volumes.

Measurements of diaphragm dimensions have also been made in patients with COPD before and after lung volume reduction surgery.^{36,42} In addition, Singh and co-workers⁴¹ have estimated the volume displaced by the diaphragm over the vital capacity range in patients with emphysema and control subjects using static radiographs. Dynamic MRI has recently been used by Suga and colleagues⁴³ to measure diaphragm and chest wall movement during slow vital capacity manoeuvres in control subjects and patients with emphysema before and after lung volume reduction surgery.

The volume of the intrathoracic structures can vary substantially among subjects of different built or sex, as well as in those with diabetes of the heart and lungs. How variations in intrathoracic air or tissue volume are accommodated by the chest wall in different conditions is a question that has not been completely addressed. Consideration of the volume and shape of the thorax is relevant to lung growth²³ and also to the action of the respiratory muscular pump²⁴ and to the distribution of pleural pressure and ventilation²⁵. The factors that determine the shape of the human thorax and that must be considered are also incompletely defined. Muscular^{23,25,26,27} and gravitational forces^{29, 30} as well as genetic factors clearly play an important role,

but other factors are also likely to be involved. As is the case for the volume of the lungs, anthropologic variables such as height, weight, sex and age are likely to affect thoracic dimensions.^{32, 11}

A decrease in the strength of inspiratory muscles with pulmonary hyperinflation is frequently invoked to explain the increased sense of effort and dyspnea in emphysema patients,³⁷ shortening of the inspiratory muscles, particularly the diaphragm,³ and a change in its geometry secondary to lung hyperinflation³⁵ are the two factors most frequently linked to the reduction of inspiratory muscle strength of emphysema patients.

Only a few studies have measured diaphragm length (Ldi) in emphysema patients,^{3,34,35,36,37} and none have determined the relationship between the strength – generating capacity of the diaphragm and Ldi or how this relationship may be modified by LVRS. In a recent investigation,³⁷ we have shown, in accord with others,^{3,34,36} that Ldi is shorter in emphysema patients than in age matched and sex matched normal subjects at their respective lung volumes (LVs).

Statement of the problem

There are very less studies done to learn the variation of diaphragm position and shape in COPD patients.

Purpose of the study

To study the variation of diaphragm position and shape in patients COPD patients.

Methodology

Study design:	Observational Analytical Study
Subjects:	30 COPD patients from Medicine Department, Dhiraj General Hospital – Observational group
	30 normal subjects without COPD.

Inclusion criteria

- COPD patients
- Both sex
- Age: 35 – 65 Years
- X – ray: PA view

Exclusion criteria

- Poor quality of chest X - rays
- AP & Lateral view
- Cardiac conditions
- Gastro intestinal disorders
- Musculo skeletal – rib injuries
- Hepatic conditions

PROCEDURE

Eight radiographic measurements were obtained on the posterior – anterior (PA) chest radiographs. Diaphragm position determined from PA radiographs in three ways, by relating each hemi diaphragm dome to skeletal structures. The position of the right and left hemi diaphragm domes referenced to the thoracic spine (vertebral level) was the primary measure. This was determined as the level at which a horizontal line drawn tangent to the hemi diaphragm dome crossed the thoracic vertebral column. The superior endplate of the first thoracic vertebral body was used as the “zero” vertebral level, with each subjacent vertebral body assigned a value of 0.8 vertebral levels and each disc space assigned a value of 0.2 vertebral levels.

Diaphragm position was also determined as the vertical distance between a horizontal line tangent to the hemi diaphragm dome and a horizontal line drawn through the midpoint of the intersecting shadows of the anterior sixth rib and posterior tenth ribs (the crossing rib level), on each side. If the dome was positioned above the crossing rib level, the results was used as a third indicator of diaphragm position, measured from the inferior margin of the second rib to the horizontal line drawn tangent to the hemi diaphragm dome.

Then we are measuring at which level of the rib the diaphragm in normal as well as in COPD patients in particularly inspiratory position. Then we are analysing the difference in shape and position of diaphragm to determine the severity COPD. Then measure the costo phrenic angle as follows;

Costo phrenic angle measurement

1. Take PA view chest X – ray
2. Put OHP Sheet over X – ray

3. Draw the diaphragm dome shape
4. Take mid clavicular point and draw the perpendicular line from the mid clavicular point
5. Draw a horizontal line from where the mid clavicular line touch the dome of the diaphragm
6. Draw the costal rib line laterally.
7. From where the costal lateral rib line and horizontal line from the diaphragm dome meet, it will make an angle – that is known as costo phrenic angle.

Statistics

Data was analysed by independent sample ‘t’ test and with spss software version 11.0

RESULTS

Table 1: Mean, Standard deviation and ‘t’ value of difference of costo - phrenic angle of right side between normal and COPD subjects.

Group	Mean	Standard deviation	‘t’ value	Significance
Normal	84.5000	2.2089	4.601	0.000
COPD	86.9333	1.8742		

*P<0.000

Table 2: Mean, Standard deviation and ‘t’ value of difference of costo - phrenic angle of left side between normal and COPD subjects.

Group	Mean	Standard deviation	‘t’ value	Significance
Normal	86.9000	3.4074	1.143	0.258
COPD	87.7333	2.0833		

*P<0.258

The results are obtained to reject the null hypothesis. Thus we obtain the changes in various position and shape (costo – phrenic angle) of diaphragm in COPD subjects related to normal subjects.

DISCUSSION

Here in this study, the various position and shape of the diaphragm particularly costo – phrenic angle is subjected to test. On that aspect any changes in diaphragm position after respiratory pathology is to be viewed clearly.

Thitiporn, David etal (2003) stated “when interpreting chest radiographs, the position and shape

of the diaphragm are routinely used to evaluate whether the lungs are unidentified, as with inadequate inspiratory effort or restrictive lung disease, or overinflated, as in emphysema or other obstructive lung diseases^{48''}.

Various literatures are explaining the modification of diaphragm position and shape of normal as well as pathological condition.

To overview that here in this study costo – phernic angle has been taken for measurement to weigh the statement that COPD patients have increased costo – phernic angle more than to when compared to their normal counterpart.

J.M.Walsh, C.L. Webber Jr etal (1992) in their study stated "the primary structural change of the thorax in COPD patients with chronic hyperinflation is confirmed to the diaphragm, with no appreciable structural change in the rib cage¹⁹.

Table – 1 and Table – 2 shows the difference in costo phernic angle of right and left side on side and COPD subjects respectively. It further explains the level of significance of increased costo – phernic angle in COPD subjects compared to normal through the values of $p < 0.000$ in table – 1 and $p < 0.258$ in table – 2 for right and left side. On account of that this study endorses the statement of increased costo – phernic angle in COPD patients through higher level of significance for both sides i.e..100% significance in right side and 0.75% in left side.

Above results is clearly emphasizing the pathological changes happen in the form of air trapping and its consequent radiological changes by its literature inputs. But the variation in some subjects is very minimal; it may due to any methodological defaults, quality of X- ray and minimal sample size. It can also be overviewed for correct interpretation.

CONCLUSION

On the basis of results and discussion, we are rejecting null hypothesis and accepting the null hypothesis, there will be changes in various position and shape (costo – phernic angle) of diaphragm in COPD subjects related to normal subjects by means high level of significance that has been by this study.

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A Survey of Potable Water Quality in Karnataka

J R Mudakavi¹, P Kavi², S G Sreekanteswara Swamy³

¹Principal Research Scientist, Department of Chemical Engineering, Indian Institute of Science, Bangalore, India,

²Project Associate, Department of Chemical Engineering, Indian Institute of Science, Bangalore, India,

³Fellow and Principal Investigator, Karnataka State Council of Science and Technology, Indian Institute of Science Campus, Bangalore, India

ABSTRACT

An integrated water quality survey of borewells in Karnataka during 2006 - 2010 has been presented. Out of the twenty eight WHO guidelines seven parameters have been selected for critical evaluation. The data indicates that fluoride and TDS levels are very high in some specific pockets of Kolar, Gulbarga and Bijapur districts. The analytical values can be used as base reference data for future borewell water quality comparison.

Keywords: Borewell Water, Potability, Data Base, Karnataka

INTRODUCTION

Providing acceptable quality of drinking water to all is high on the priority of Governments. Where no alternative is available, ISO: 10500:1991 (Table 1) prescribes higher permissible limits for 31 parameters (1). Among these iron, chloride, fluoride, nitrate, sulphate and TDS are important for health and acceptability. Presence of fluoride and nitrate in drinking water leads to health hazards viz., fluorosis and methemoglobinemia (2, 3).

Eastern and Northern Regions of Karnataka suffer from chronic water shortage. Karnataka is considered as the second most draught prone state in India, next only to Rajasthan (4).

Karnataka State Council of Science and Technology (KSCST) has undertaken several projects in various drought prone parts of Karnataka for monitoring the ground water and evaluating the feasibility of recharging the ground water (5). These areas have been divided into Bangalore, Belgaum, Gulbarga and Mysore divisions. This report covers several critical parameters, viz., iron, chloride, fluoride, nitrate, sulphate, TDS and total hardness in all four divisions.

EXPERIMENTAL

All the reagents were of analytical grade and DM water was used for analysis unless otherwise specified. All the water samples were collected from the existing borewells and analysed according to ISO: 10500:1991 Standard.

Iron, fluoride and nitrate were estimated spectrophotometrically by o-phenanthroline, zirconyl chloride-SPADNS and chromotropic acid methods, respectively. Chloride content was determined argentometrically. Total hardness was determined by EDTA titration. TDS was determined gravimetrically.

RESULTS AND DISCUSSION

Division wise results have been presented in Tables 2-5. The exact locations of the borewells are shown in Fig.1.

Iron

In Bangalore division, iron values ranged from 0.23 - 0.52 ppm. One sample each in Gauribidanur, Pavagada and Shikaripura, exceeded the prescribed the limit.

In Belgaum division, average values of iron ranged from 0.2 to 0.3 ppm which are acceptable according to ISO-10500:1991. In Gulbarga division the values ranged from 0.1 - 0.3 ppm. Mysore division had maximum deviations in Virajpet. Values ranged from 0.03 - 1.62 ppm. Most samples are potable according to the WHO guidelines (1 ppm).

Chloride

Prescribed upper limits for chloride values in drinking water are 250, and in the absence of alternate source, 1000 ppm. Field samples showed a wide range of concentrations from 8 ppm at Marichina, Belthangadi to 1154 ppm at Yelbarga.

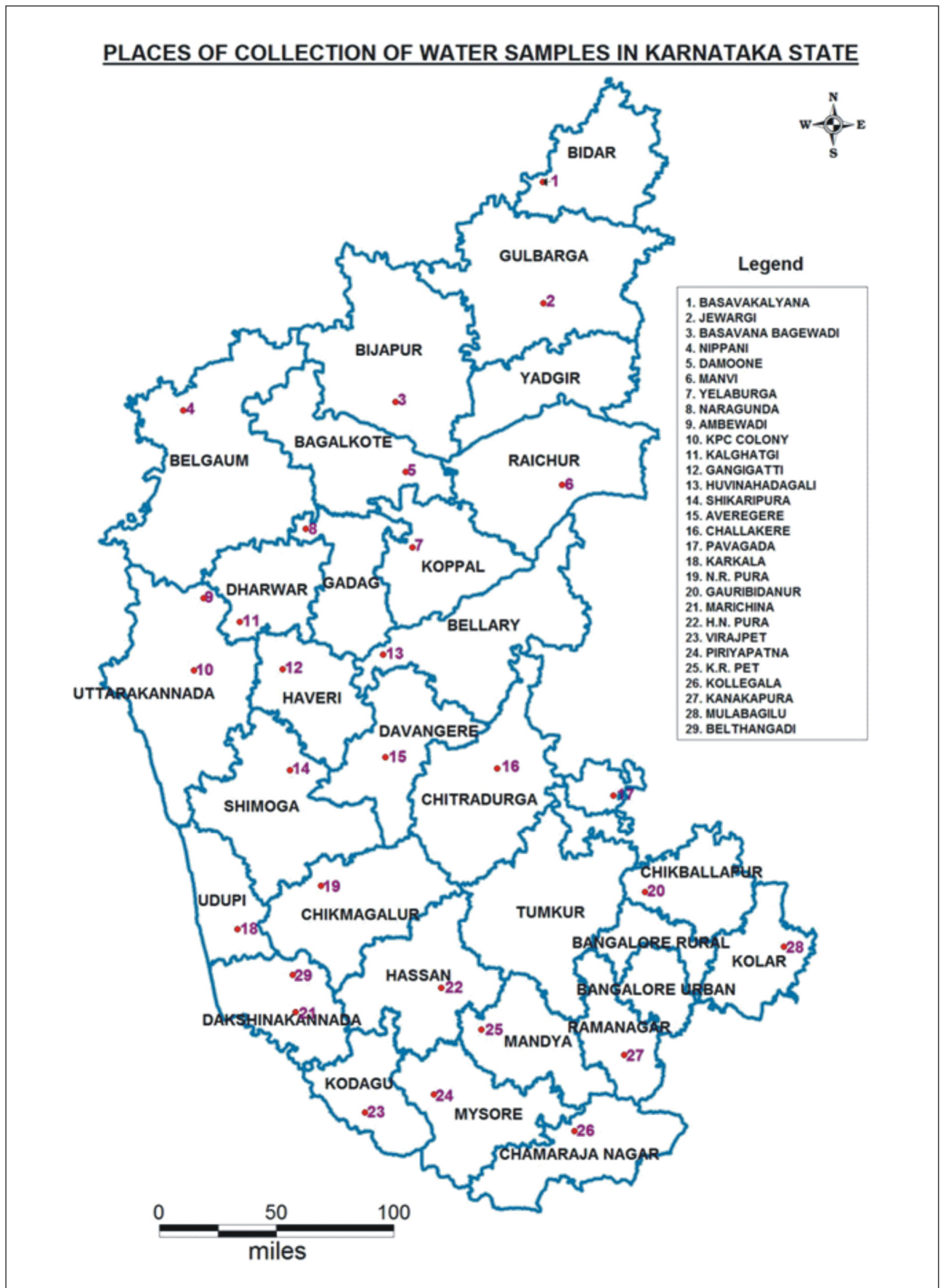


Fig. 1. Sample collection sites.

Table 1: Drinking water specifications

Sl.No	Parameter	Requirement (Permissible limit) as per IS:10500/1991	Permissible limit in the absence of alternate source
1.	Colour, Hazen units, Max	5	25
2.	Odour	Unobjectionable	--
3.	Taste	Agreeable	--
4.	Turbidity, NTU, Max	5	10
5.	pH Value	6.5 to 8.5	No Relaxation
6.	Total hardness as CaCO ₃ , ppm, Max	300	600
7.	Iron as Fe, ppm, Max	0.3	1
8.	Chloride Cl, ppm, Max	250	1000
9.	Residual Free Chlorine, ppm, Max	0.2	--
10.	Total dissolved solids, ppm, Max	500	2000
11.	Calcium as Ca, ppm, Max	75	200
12.	Copper as Cu, ppm, Max	0.05	1.5
13.	Manganese as Mn, ppm, Max	0.1	0.3
14.	Sulphate as SO ₄ , ppm, Max	200	400
15.	Nitrate as NO ₃ , ppm, Max	45	No relaxation
16.	Fluoride as F, ppm, Max	1.0	1.5
17.	Phenolic compounds as C ₆ H ₅ OH, ppm, Max	0.001	0.002
18.	Mercury as Hg, ppm, Max	0.001	No relaxation
19.	Cadmium as Cd, ppm, Max	0.01	No relaxation
20.	Arsenic as As, ppm, Max	0.05	No relaxation
21.	Cyanide as Cn, ppm, Max	0.05	No relaxation
22.	Lead as Pb, ppm, Max	0.05	No relaxation
23.	Zinc as Zn, ppm, Max	5	15
24.	Chromium as Cr+6, ppm, Max	0.05	No relaxation
25.	Alkalinity, ppm, Max	200	600
26.	Aluminium as Al, ppm, Max	0.03	0.2
27.	Boron as B, ppm, Max	1	5
28.	Magnesium as Mg, ppm, Max	30	100

Table 2. Drinking Water Analysis – Bangalore Division

Sl.No	District	Location	Iron(Fe) 0.03 ppm	Chloride (Cl) 250 ppm	Fluoride (F) 1.0 ppm	Nitrate (NO ₃) 45 ppm	Sulphate (SO ₄) 200 ppm	TDS 500 ppm	Total Hardness 300 ppm	Remarks
1.	Shimoga	Shikaripua	0.08	255	0.33	40	60	690	440	Total hardness is more than desirable limit
2.	Shimoga	Shikaripua	0.25	252	0.34	69	88	790	508	Nitrate exceeds permissible limit - hard water
3.	Bangalore rural	Kundana-Devanahalli Tq	0.01	78	0.52	42	29	370	200	Potable
4.	Davanagere	Averegere-Davanagere Tq	0.10	518	0.81	149	256	2015	698	Contain nitrate, sulphate, salts-not potable
5.	Davanagere	Pavagada	0.10	890	0.64	96	240	2380	1192	High TDS -not potable
6.	Tumkur	Pavagada	0.05	106	1.99	11	69	430	176	High fluoride -not potable
7.	Tumkur	Tumkur City	0.23	106	1.45	9	18	220	14	High fluoride -not potable
8.	Chitradurga	Challakere	0.00	322	1.20	18	120	1270	364	Fluoride, TDS, alkalinity beyond limit. Potable in the absence of alternative source
9.	Chitradurga	Challakere	0.00	213	1.40	28	120	1050	348	Fluoride, TDS, alkalinity beyond limit. Potable in the absence of alternative source

Table 2. Drinking Water Analysis – Bangalore Division (Contd.)

Sl. No	District	Location	Iron(Fe) 0.03 ppm	Chloride (Cl) 250 ppm	Fluoride (F) 1.0 ppm	Nitrate (NO ₃) 45 ppm	Sulphate (SO ₄) 200 ppm	TDS 500 ppm	Total Hardness 300 ppm	Remarks
10.	Chikkaballapur	Gauribidanur	0.52	28	0.31	2	21	175	104	May be used in the absence of alternative source
11.	Chikkaballapur	Gauribidanur	0.03	599	0.40	25	270	1720	980	TDS exceeds permissible-not potable
12.	Kolar	Mulabagilu	0.06	440	0.59	181	192	1962	552	Nitrate exceeds permissible limit-not potable
13.	Kolar	Mulabagilu	0.03	188	0.31	42	153	830	416	TDS and total hardness exceed permissible limit-may be used in the absence of alternative source
14.	Ramanagar	Kanakapura	0.03	134	0.92	121	75	690	388	Nitrate exceeds permissible limit-hard water- not potable
15.	Ramanagar	Kanakapura	0.03	255	0.45	48	71	830	616	Nitrate and hardness exceed permissible limit- not potable

Table 3. Drinking Water Analysis – Belgaum Division

Sl. No	District	Location	Iron(Fe) 0.03 ppm	Chloride (Cl) 250 ppm	Fluoride (F) 1.0 ppm	Nitrate (NO ₃) 45ppm	Sulphate (SO ₄) 200 ppm	TDS 500 ppm	Total Hardness 300 ppm	Remarks
1.	Haveri	Gangigatti village, Shigov Tq	0.20	286	0.64	76	180	1043	448	Very high- TDS and high Nitrate-not potable
2.	Haveri	Gangigatti Panchayat compound, Shigov Tq	0.20	616	0.96	156	320	1982	740	Very. high Nitrate, TDS & TH - not potable
3.	Haveri	Gangigatti village, Shigov Tq	0.30	686	1.08	180	460	2387	960	Very. high Nitrate, TDS & TH - not potable
4.	Bijapur	Basvana Bagewadi	0.02	204	0.58	21	772	810	380	High- TDS, TH may be used in the absence of alternative source
5.	Belgaum	Nippai, Chikkodi Tq (TMC supply)	0.00	84	0.12	19	52	310	136	Potable
6.	Belgaum	Nippai, Chikkodi Tq (TMC supply)	0.00	115	0.64	25	90	499	244	Potable
7.	North Kanara	Anbeawadi, Huliya Tq (TMC supply)	0.00	14	0.00	3	5	48	20	Potable
8.	North Kanara	KPC colony, Dandeli	0.00	84	0.12	20	32	266	100	Potable
9.	Bagalkote	Danoone, HunagundaTq	0.20	59	0.22	18	48	285	148	Potable
10.	Bagalkote	Danoone, HunagundaTq	0.00	266	0.97	70	160	960	404	High Nitrate-not potable
11.	Dharwar	Gangigatti, Kalagatagi Tq	0.20	92	0.32	26	63	393	192	Potable
12.	Dharwar	Gangigatti, Kalagatagi Tq	0.20	92	0.26	22	61	380	184	Potable
13.	Bidar	Basava Kalyana	0.10	120	1.30	64	91	352	960	Nitrate is more than permissible-not potable

Table 4. Drinking Water Analysis - Gulbarga Division

Sl. No	District	Location	Iron(Fe) 0.03 ppm	Chloride (Cl) 250 ppm	Fluoride (F) 1.0 ppm	Nitrate (NO ₃) 45ppm	Sulphate (SO ₄) 200 ppm	TDS 500 ppm	Total Hardness 300 ppm	Remarks
1	Gadag	Naragunda	0.30	76	0.68	24	52	339	168	Potable
2	Gadag	Naragunda	0.20	34	0.12	12	24	158	80	Potable
3	Bellary	Hoovina Hadagali	0.02	524	0.57	84	207	1650	768	High Nitrate & TH -not potable
4	Gulbaraga	Jewargi	0.10	98	1.95	24	105	288	46	High Fluoride -not potable
5	Gulbaraga	Jewargi	0.10	101	2.05	22	104	0.84	460	High Fluoride -not potable

Table 4. Drinking Water Analysis - Gulbarga Division (Contd.)

Sl. No	District	Location	Iron(Fe) 0.03 ppm	Chloride (Cl) 250 ppm	Fluoride (F) 1.0 ppm	Nitrate (NO ₃) 45ppm	Sulphate (SO ₄) 200 ppm	TDS 500 ppm	Total Hardness 300 ppm	Remarks
6	Koppal	Yelaburga	0.15	725	2.55	208	617	1560	2380	High Fluoride, sulphate & TDS - not potable
7	Koppal	Yelaburga	0.10	426	2.80	122	312	872	1420	High Fluoride, TDS & TH -not potable
8	Koppal	Yelaburga	0.20	1154	2.90	142	1472	4470	2240	High Fluoride, TDS & TH-not potable
9	Raichur	Manvi	0.10	389	2.85	80	381	1550	792	High Fluoride, TDS & TH -not potable
10	Raichur	Manvi	0.10	406	1.60	84	368	1590	788	High Fluoride, TDS & TH -not potable
11	Raichur	Manvi	0.15	314	1.85	88	318	1330	676	High Nitrate & TH -not potable

Table 5. Drinking Water Analysis - Mysore Division

Sl. No	District	Location	Iron(Fe) 0.03 ppm	Chloride (Cl) 250 ppm	Fluoride (F) 1.0 ppm	Nitrate (NO ₃) 45 ppm	Sulphate (SO ₄) 200 ppm	TDS 500 ppm	Total Hardness 300 ppm	Remarks
1	Kodagu	Virajpet	1.62	6	0.00	1.5	0.00	85	68	High Iron-not potable
2	Kodagu	Balagooda	0.00	4	0.00	0.00	0.00	115	104	Potable
3	Chamara janagar	Rudrashetty Doddi	0.06	35	0.67	236	3.00	597	390	Potable
4	Chamara janagar	Kollegal Tq	0.03	56	0.08	36	24.00	485	300	Potable
5	Chamara janagar	Kollegal Tq	0.03	56	0.08	16	24.00	485	300	Potable
6	Chikmagalur	NR Pura	0.00	49	0.00	12	10.00	233	140	Potable
7	Dakshina Kannada	Marichina, Belthangadi Tq	0.00	5.6	0.03	2.5	0.00	83	56	Potable
8	Dakshina Kannada	Marichina, Belthangadi Tq	0.00	8	0.07	36	0.00	169	132	Potable
9	Hassan	Hariharapura- Holenarasipura	0.06	105	0.18	74	32.0	564	420	Potable
10	Mysore	Piriyapatna	0.22	217	0.08	170	90.0	916	650	High Nitrate, TDS & TH -not potable
11	Mysore	Piriyapatna	0.76	336	0.04	15	130.0	1530	740	High Iron, chloride, nitrate, TDS & TH -not potable
12	Udupi	Karkala	0.00	14	0.00	231	0.5	75	60	Potable
13	Mandya	Hosaholalu- KRpet	0.88	364	0.14	.44	110.0	1719	660	High Iron, chloride, nitrate, TDS & TH -not potable

In Gauribidanur maximum chloride concentration was 28 ppm. All other values in Bangalore division ranged from 78 - 890 ppm. 7 samples conformed to ISO and 8 samples were within WHO limits.

Samples from Belgaum division showed an average of 209.1 ppm chloride with a standard deviation of 70.57. Highest values of 686 and 616 ppm were observed at Ganjigatti in Shiggon Taluk. In Gulbarga division also there was wide variation with 4 samples showing 100 ppm and 7 samples showed more than 300 ppm.

Chloride values were least in Mysore division with only 4 samples showing values above 100 ppm. Only in Periyapatna and Hosaholalu, chloride was above 300 ppm but below the WHO standard.

Fluoride

In Bangalore division, fluoride values averaged 0.78 ± 0.18 ppm and exceeded the limits. In Pavagada and Challakere the water is not potable.

In Belgaum division (average 0.55 ± 0.2 ppm) only Ganjigatti and Basavakalyana showed more than 1 ppm of fluoride. All were fit for drinking.

Almost all the samples, except three in Gulbarga division were not fit for drinking without prior treatment because fluoride content (average 1.81 ± 0.43 ppm) exceeded 1.5 ppm. In Mysore division fluoride values (average 0.098 ± 0.03 ppm) were low.

Nitrate

In Bangalore division (average 58.8 ± 22.1 ppm) nitrate was greater than 45 ppm in Shikaripura, Averegere, Mulabagilu and Kanakapura samples. Some borewells showed low nitrate values in Belgaum division. BIS limits were exceeded in 5 samples, of which 3 were from Ganjigatti and one each from Danoone and Basavakalyana. The average value in the acceptable range was 19.3 ± 7.1 ppm and that in unacceptable range was 109.2 ± 54.5 ppm.

Sulphate

Samples in Bangalore (except Averegere in Davanagere district) and Mysore division were well below the BIS limit (200 ppm). In Belgaum division, Ganjigatti and Basavanabagewadi villages showed abnormal sulphate values of 320, 460 and 772 ppm respectively. All other values were below 100 ppm. In Gulbarga (average 860 ± 93.3 ppm) most of the samples except 4 showed high sulphate.

Total Dissolved Solids

Abnormally high levels of TDS were present in Bangalore division. Only 3 samples showed less than BIS limit (500 ppm). According to WHO guidelines (2000 ppm) 5 samples exceeded the limits.

In Belgaum division, almost half of the samples were within the BIS acceptable limits and 3 samples of Ganjigatti village were acceptable by WHO standards.

Gulbarga division showed wide variations in TDS levels. Five samples were potable. All others had TDS values in excess of 1300 ppm, but it was evident that wide variations among them existed with a maximum of 4470 ppm TDS. These samples were not potable, falling within the BIS limits.

In Mysore division also wide variations in TDS values have been observed with 5 of them beyond the BIS limit. Periyapatna and Hosaholalu showed the highest TDS values (1530 and 1719 ppm) but other samples in the same region showed acceptable range of TDS.

Total Hardness

In Bangalore region, only 3 samples exhibited total hardness below 300 ppm and 11 samples fell within the WHO guidelines (600 ppm). In Belgaum region 4 samples had hardness values higher than the BIS standards and 3 above WHO guidelines. In contrast, Gulbarga division had only 2 samples within the BIS limits and all others exceeded the WHO limits.

In Mysore division, 3 samples were acceptable and the rest were acceptable by WHO standards. Periyapatna and Hosaholalu samples showed wide variations.

Decision Tree

It is evident from the discussion above that most of the borewell water samples fall within the BIS and

WHO guidelines and are potable. When one or more of the parameters exceed the specified limits a conscious evaluation of the important parameters is essential. In terms of health effects, the importance of each parameter can be ranked as shown below.

Iron < sulphate < chloride < TDS < TH < nitrate < fluoride

Fluoride is associated with bone decay and cancer while nitrate is associated with diseases of the stomach and intestine, heart, nervous system, reproductive system and with certain types of cancer. Therefore when some of the above parameters fall above the specified limits, say, within ± 10 percent, water can be used for drinking provided nitrate and fluoride are within the limits. Such a decision is recommended taking into consideration the uncertainties in values. However no relaxation is possible if fluoride and nitrate values are exceed the specified limits.

In some regions like Periyapatana and Hosaholalu, for example, there were extreme variations the reasons for which need to be investigated further.

CONCLUSIONS

Borewell water samples from different parts of Karnataka have been evaluated for potability. 19 samples were potable. Suggestions have been made to relax the limits in some cases. But if nitrate and fluoride concentrations exceed the prescribed limits, pretreatment is necessary for making the water potable.

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Dermatoglyphics in the Essential Hypertension in Marathwada Region

Sanjay K Kachhave¹, Prashant V Solanke², Amrut A Mahajan³, S S Rao³

¹Assistant Professor, Anatomy Department, D.D. Medical College and Hospital, Thiruvallur, Chennai, ²Assistant Professor, Community Medicine Department, Sree Mookambika Institute of Medical Sciences, Kulasekharam, Kanyakumari District, Tamil Nadu, ³Professor, Anatomy Department, Government Medical College, Aurangabad, Maharashtra

ABSTRACT

Background: The word 'Dermatoglyphics' indicates the study of epidermal ridge configuration on palms, soles and finger tips. Hypertension is an increasingly important medical and public health issue (Chobanian AV et al, 2003).

Methods: We carried the study in sixty patients of essential hypertension and sixty normal individuals. The patients of essential hypertension were collected from Government Medical College & Hospital, Department of Medicine, Aurangabad during the period from 1st May 2005 to 1st May 2006 attending OPD medicine and those admitted in the medicine wards. The prints of normal individuals were obtained from Aurangabad & Parbhani. In present study we compare the Dermatoglyphics patterns of patients suffering from essential hypertension with normal individuals.

Results: In this study we observed that percentage frequency of ulnar loops was 54.7% in essential hypertension patients and 64.0% in controls & there is increase in TFRC in right and left hand operations of essential hypertension as compared to controls.

Conclusion: There is increase in TFRC in both hand operations of essential hypertension & atd angle showed a significant decrease in patients of essential hypertension than controls.

Keywords: Dermatoglyphics, Ulnar Loop, Total Finger Ridge Count.

INTRODUCTION

Dermatoglyphics has long been recognized as a scientific and valuable method for medico legal, anthropological and genetic studies.

Since ancient times, these ridge patterns and lines were used by palmists and future tellers for predicting the future.

In early foetal life, the differentiation of epidermal ridges takes place. They are genetically determined and influenced by physical, topographical and environmental factors. These patterns do not change in

an individual through out his life and no two patterns are alike.

The unchanging patterns of the epidermal ridges induced the use of Dermatoglyphics for diagnoses of twins, questioned paternity and other hereditary and genetic disorders (Penrose 1969, and Hirsch 1960).

Dermatoglyphics patterns have been observed in various diseases associated with chromosomal abnormalities like Mongolism (Cummins, 1926); Turner's syndrome (Engel, 1965); Mental retardation (Hirsch, 1960 and Joshi 1989).

They were also studied in CVS disorders (Rashed, 1975) Diabetes (Barta, 1970), Schizophrenia (Raphel, 1962; Chavan, 1985); and ABO blood groups (Otto, 1968; Nayak, 1973; Mahajan, 1986), which are thought to have a genetic influence.

Patients with arterial hypertension and no definite cause are said to have primary, essential or idiopathic hypertension. In hypertensive patients, essential

Corresponding author:

Prashant V Solanke

Assistant professor, Community Medicine Department, Sree Mookambika Institute of Medical Sciences, Kulasekharam, Kanyakumari District, Tamil nadu
Mobile: 9751926130

E-mail id: drprashantsolanke@rediffmail.com

hypertension accounts for 92 to 94% at General population Clinics and 65 to 85% at Specialty Referral Clinics.

AIM AND OBJECTIVE

The present study was designed to compare the Dermatoglyphics patterns of patients suffering from essential hypertension with normal individuals.

REVIEW OF LITERATURE

These patterns have attracted the attention of lay persons and future tellers since long time.

Mayer (1788) time noted that the skin ridges are never duplicated in two persons, even not in Twins.

In a monogram (1926) Cummins and Midlow for the first time coined the term Dermatoglyphics for the scientific study of epidermal ridges.

CLASSIFICATION OF BLOOD PRESSURE

The JNC 7 report has introduced a new classification because of the new data on lifetime risk of hypertension (Chobanian AV et al, 2003).

Classification of BP for Adults 18 Years and Older

Blood pressure Classification	Systolic Blood Pressure (mmHg)	Diastolic Blood Pressure (mmHg)
Normal	<120	And <80
Pre-hypertension	120-139	or 80-89
Stage I Hypertension	140-159	or 90-00
Stage II Hypertension	>160	or >100

VARIOUS FORMS OF HYPERTENSION

Patients with hypertension and no definable cause are said to have primary, essential or idiopathic hypertension while those with a underlying cause are said to have secondary hypertension. Essential hypertension is by far the most common type of hypertension (Fisher et al, 2005).

BASIC PRINCIPLES OF DERMATOGLYPHICS

In 1982, Galton described three basic patterns i.e. arch, loop and whorl.

OPEN PALMAR LAND MARKS

Main line – from the proximal component of each triradius a main line can be traced. Thus there are five mainlines – A, B, C, D, and T for the triradii, a, b, c, d,

and t. Points of terminations of the mainlines along the periphery of palm are given fixed numbers. Mainline index is calculated by adding up the number of terminations of mainlines A & D. This index gives an idea of epidermal ridge orientation in palm i.e. if the mainline index is high; ridge orientation in palm is horizontal while if it is low ridge orientation in palm is vertical.

Axial triradius – Named as “t”, it is usually present very close to the proximal margin of the palm, in the carpal area along the axis of 4th metacarpal bone.

The position of “t” is indicated by different of symbols as follows:-

- t - When triradius is near the distal wrist crease.
- t'' - When triradius is situated near the center of palm.
- t' - When it is intermediate to t and t''.
- t''' - When it is extremely distally shifted.

To, indicate the position of triradius an indirect method of measuring at angle is used.

atd angle – it is the angle formed by a line drawn from triradius ‘a’ to triradius ‘t’, with a line from triradius “:t” to triradius ‘d’, when more than axial triradii are present, the most distal is used to measure ‘atd’ angle.

Ridge count in palm – Ridge count between various triradii is done such as a-b, b-c, c-d and d-t. Most commonly used in clinical diagnosis is the a-b ridge count.

c-line types – C mainline is also altered in various disorders. This mainline may be directed to ulnar, radial or proximal direction and accordingly it is designated at C-u, C-r and C-p.

Flexation creases in palm – These are locations of firm attachment of the skin to the underlying structures.

MATERIAL AND METHOD

Present study has been carried out in sixty patients of essential hypertension and sixty normal individuals. Out of sixty essential hypertension 46 were male and 14 were female. The total number of normal cases studied was 60.

The patients of essential hypertension were collected from Government Medical College & Hospital,

Department of Medicine, Aurangabad during the period from 1st May 2005 to 1st May 2006 attending OPD medicine and those admitted in the medicine wards. The prints of normal individuals were obtained from Samarthnagar, Nageshwarwadi, Sambhaji Peth, Khadkeshwar, in Aurangabad, Shivram nagar, Ramakrishna Nagar, Bank Colony, Shivajinagar, in Parbhani.

A detailed clinical history was recorded regarding the age, sex, duration of hypertension, drug history, complete and detailed general and systemic examination including examination of pulse, blood pressure, respiratory system, cardiovascular system, per abdominal examination and central nervous system, and relevant investigations including blood sugar, blood urea, serum creatinine, serum cholesterol, fundus and urine albumin were recorded in the prescribed proforma. A resting 12 lead electrocardiogram was done in every patient.

Inclusion criteria

The studied cases comprised of newly detected and old cases of essential hypertension reporting to OPD Medicine or Medicine Ward, Government Medical College, Aurangabad.

Exclusion criteria

1. Patients with secondary hypertension were excluded.
2. History of smoking
3. Diabetes mellitus
4. Ischemic heart disease
5. Serum cholesterol > 200 mg/dl
6. Pregnancy
7. Fever

Criteria for selection of controls

60 age and sex matched healthy non hypertensive individuals without any of the above mentioned exclusion criteria and with normal clinical examination were chosen as controls from Samarthnagar, Nageshwarwadi, Sambhaji Peth, Khadkeshwar, in Aurangabad, Shivram nagar, Ramakrishna Nagar, Bank Colony, Shivajinagar, in Parbhani.

The age group of the essential hypertension patients was ranging from 31 to 70 years and of the normal, age group was from 31 years to 70 years.

The Dermatoglyphics prints were taken using following method:

1. Subjects were asked to wash their hands with soap and dried so as to remove the dust from the palms.
2. Prints were taken on white drawing paper. Ore's duplicating ink was used for taking the prints.
3. For smearing the ink special ball was used prepared from cotton, gauze and linen.
4. Paper was kept on clear hard surface.
5. The inked hand was placed on paper.
6. At first the palmer aspect of wrist placed firmly on the paper then, all the fingers were firmly pressed on the paper one by one.
7. Each finger tip was rolled for getting complete prints.

The prints were studied with the help of hand lens and following parameters were studied:

1. Finger tip patterns

- a) Ulnar loops
- b) Radial loops
- c) Whorls
- d) Arches

2. Triradial counts

3. 'atd' angle

4. a-b ridge count

The prints were studied with the help of above parameters.

Observations were taken tabulated and analyzed for statistical significance by applying 'Chi' test.

OBSERVATIONS

Table 1. Showing incidence of essential hypertension male and female

No. of patients of essential hypertension	Female No. (%)	Male No. (%)
60	46(76.66%)	14(23.33%)

The above table it is clear that the incidence of essential hypertension is more in males (76.66%) than females (23.33%).

Table 2. Frequency percentage of finger tip pattern in patients and control group for right and left hand both.

Pattern	Essential Hypertension (60)			Control group (60)		
	Right	Left	Mean	Right	Left	Mean
UL	60	49.3	54.7	61.3	66.7	64
W	29.3	38	33.7	30	29.3	29.6
A	9	9.7	9.35	6	2	4
RL	1.7	3	2.2	2.7	2	2.4

The above table shows that ulnar loop are decreased in patients of essential hypertension whereas whorls are increased in patients so also arches are increased in patients and radial loops show no changes in patients.

Table 3. Range with number and percentage frequency of arches in right and left hands together in both groups.

Range o Ulnar loops	Patient	Control
0-1	110 (91.7)	112 (93.3)
1-2	10 (8.3)	8 (6.7)
2+	0 (0.00)	0 (0.00)

$$X^2 = 0.06 \quad X^2 = 0.06$$

$$P = 0.806 \quad P = 0.806$$

It is seen from above table that, 0 – 1 range of arches in right and left hands together of both groups is high which statistically non significant ($P > 0.05$).

Table 4. Range with number and percentage frequency of radial loops in both hands of both groups.

Range of Radial loops	Patient	Control
0-1	108 (90.0)	106 (88.3)
1-2	10 (8.3)	14 (11.7)
2+	2 (1.7)	0 (0.00)

$$X^2 = 2.69 \quad X^2 = 2.69$$

$$DF = 2 \quad DF = 2$$

$$P = 0.261 \quad P = 0.261$$

The above table shows that no much differences in “1” radial loops/ palm in both right and left hands together in both groups is observed and it is non significant ($P > 0.05$).

Table 5. Range with number and frequency percentage of ulnar loops in right and left hands together in patients and control groups.

Range of Ulnar loops	Patient (RT + LT)	Control (RT + LT)
0-1	26 (21.7)	20 (16.7)
1-2	21 (17.5)	4 (3.3)
2+	73 (60.8)	96 (80.0)

$$(X^2 = 15.47, DF = 2, P = 0.0004)$$

Statistically significant.

It is seen from the above table that 2+ ulnar loops frequency of right and left hands together of patients is much less than that in control cases which is statistically significant.

Above table shows that 0-1 frequency of whorls in right hand is more in both groups which is significant ($P < 0.05$).

Table 6. Range with number and percentage frequency of whorls in right and left hand together in both groups.

Range o Ulnar loops	Patient	Control
0-1	64 (53.3)	66 (55.0)
1-2	18 (15.5)	26 (21.7)
2+	37 (30.9)	28 (23.3)

$$(X^2 = 2.37, DF = 7, P = 0.306)$$

Statistically non-significant.

Above table shows that 0-1 whorls frequency is more in right and left hand together of both groups is high which is non significant ($P > 0.05$).

Table 7. Total finger ridge count (TFRC) in right and left hand of patients and controls

Hand	Essential hypertension		Controls		P value
	Mean	RD	Mean	RD	
Patient	136.00	0.49	120.22	0.39	$P > 0.05$

In the above table, as $P > 0.05$ i.e. there is increase in TFRC in right and left hand operations of essential hypertension as compared to controls which is statistically significant.

Table 8. Showing means value of atd angle in right and left hand

Cases studied	Essential hypertension	Control
	Mean \pm S.D.	Mean \pm S.D.
60(60 palms)	41.5 \pm 2.91	43 \pm 2.34

$$RD = 9.305, P, \square 0.05 \text{ significant}$$

The mean value of atd angle in two hands when study statistically shows significant decrease in essential hypertension and control groups.

DISCUSSION

“Dermatoglyphics” word literally means skin carvings. Altogether, Dermatoglyphics relates to the surface characteristics of the skin with respect of its furrows, folds, wrinkles and ridges or in other words, its fine sculpturing.

Number and frequency percentage of finger tip pattern in patient and control group (Ulnar loops)

It is observed that, percentage frequency of ulnar loops was 54.7% in essential hypertension patients and 64.0% in controls in present study. From this study it is seen that, frequency of occurrence of ulnar loops in essential hypertension patients is much less as compared to controls which is seen by Chi – square value, which is statistically significant.

While Pursnani ML, Elhence GP, Tibrewala L. (1989) in their study observed that Number and frequency percentage of finger tip pattern in patient was lower than control group (Ulnar loops) which is statistically significant. Present study co – relates with the above study.

Number and frequency percentage of finger tip pattern in patient and control group (Whorls)

Percentage frequency of whorl pattern was 33.67% in essential hypertension in comparison with control i.e. 29.67% in present study. The values of Chi – square are such that they are statistically insignificant.

While Pursnani ML, Elhence GP, Tibrewala L. (1989), in their study observed that Number and frequency percentage of finger tip pattern in patient and control group (Whorls) was statistically insignificant. Present study co – relates with their observation.

Number and frequency percentage of finger tip pattern in patient and control group (Arches)

The incidence of arches in essential hypertension patients and controls when studied showed no statistically significant findings.

Pursnani ML, Elhence GP, Tibrewala L. (1989), in their study observed increased incidence of arches in essential hypertension patients as compared to controls. Present study does not co – relates with the above observations.

Number and frequency percentage of finger tip pattern in patient and control group (Radial loops)

The number and frequency percentage of finger tip patterns in essential hypertension patients and control groups (radial loops) when studied showed no statistically significant finding.

Pursnani ML, Elhence GP, Tibrewala L. (1989), in their study observed Number and frequency percentage of finger tip pattern in patient and control group (Radial loops) which are statistically significant. Present study does not co – relates with their observation

SUMMARY AND CONCLUSIONS

1. Ulnar loop frequency showed significant decrease in patients of essential hypertension as compared to controls.
2. Total Finger Ridge Count (TFRC) was increased significantly in essential hypertension cases in our study.
3. atd angle showed a significant decrease in patients of essential hypertension than controls.

Conflict of Interest: None

Source of Disclosure: No

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Oral Health Considerations in Pregnant Women- A Review

Rajeshwari B Patil¹, Savitha S Shettar²

¹Assistant Professor, Department of Gynaecology and OBG, S.N.Medical College, Bagalkot, Karnataka, ²Assistant Professor, Department of Oral Medicine & Radiology, College of Dental Sciences, Davangere, Karnataka

ABSTRACT

Pregnancy is a unique time in women's life accompanied by various physiologic, anatomic and hormonal changes in the body. The mouth is obvious portal of entry to the body, and oral health reflects and influences general health and well being. Maternal oral health has significant implications for birth outcomes and infant oral health. Oral health promotion should include education of women and their health care providers ways to prevent oral disease from occurring, and referral for dental services when disease has occurred. This article discusses the oral changes during pregnancy and general considerations in care of pregnant patients.

Keywords: Oral Health, Pregnancy Tumor, Periodontal Disease, Dental Caries

INTRODUCTION

Pregnancy is associated with various physiologic and hormonal changes in the body which in turn will lead changes in oral health. Most common oral changes seen during pregnancy include gingivitis, pyogenic granuloma, dental caries, increased susceptibility to odontogenic infections, ptyalism, enamel erosion, tooth mobility and xerostomia. Even a healthy pregnancy shows changes in various organ systems including cardiovascular, respiratory and gastrointestinal systems. Although these adaptations are normal they do require consideration and adjustments in dental treatments.

Oral changes during pregnancy

Periodontal disease and pregnancy

Gingivitis usually appears in first trimester of pregnancy.¹ This form of gingivitis results from increased levels of progesterone and estrogen causing an exaggerated gingival inflammatory reaction to local irritants. The interproximal papillae become red, edematous and tender to palpation, and they bleed easily if subjected to trauma. In some patients, the condition will progress locally to become a pyogenic granuloma or "pregnancy tumour," which is most commonly seen on the labial surface of the papilla. Small lesions respond well to local debridement, chlorhexidine rinses and improved oral hygiene measures, but large lesions require deep excision. Because intraoperative bleeding can be difficult to

control, such surgery should be performed by clinicians with requisite training and experience.¹

Tooth mobility is a sign of periodontal disease caused by mineral changes in the lamina dura and disturbances in the periodontal ligament attachments. Vitamin C deficiency contributes to this problem, so the patient should be advised accordingly. Removal of local gingival irritants, therapeutic doses of vitamin C and delivery typically result in reversal of the tooth mobility.²

Some studies have shown an association between periodontal disease and adverse pregnancy outcomes such as preterm labour and low birth weight (PLBW)^{3, 4} but other studies have shown no relation between periodontal disease and pregnancy outcomes.⁵

Upregulation of proinflammatory cytokines resulting from the normal host response to an infectious agent may represent the key mechanism linking periodontal disease to preterm low-birth weight. Microbiological products such as endotoxin will trigger a host immune response, causing both local inflammation and activation of soluble proinflammatory mediators such as IL-1, TNF α , and MMPs. These inflammatory markers have been shown to cross the placental barrier and to cause fetal toxicity, resulting in preterm delivery and low-birth-weight babies.⁶

While research continues into the pathophysiology of a cause-and-effect relation between oral health and pregnancy outcomes, it is prudent to keep the pregnant

patient's periodontal system as free of disease as possible.

Some investigators have hypothesized a potential role for maternal periodontal disease as a risk factor for preeclampsia. In a retrospective analysis of data collected as part of the Oral Conditions and Pregnancy Study, Boggess et al. reported that women were at higher risk for preeclampsia if they had severe periodontal disease at delivery or if they had periodontal disease progression during pregnancy.⁷ Preeclampsia is a hypertensive disorder of pregnancy responsible for significant maternal and fetal morbidity and mortality. Preeclampsia affects up to 5% of pregnant women.⁸

If the relationship between maternal periodontal disease and preeclampsia risk proves causal in nature, then prevention of periodontal disease before pregnancy or treatment of periodontal disease during pregnancy may represent a novel approaches to the prevention of preeclampsia.

DENTAL CARIES AND PREGNANCY

Cariogenic bacteria are typically acquired by young children through direct salivary transmission from their mothers. For this reason, mothers who have themselves experienced extensive tooth decay and therefore most likely harbor high titers of *mutans streptococci* in their saliva will more effectively transmit this infection vertically, thereby putting their young children at elevated risk for early childhood caries. Although maternal cariogenic bacteria can be isolated in the pre-dentate infant's mouth, these organisms become established in the dental plaque on the tooth surface only after teeth first appear at around six months of age. As with adults, children of low-income families experience substantially more extensive and severe disease and less treatment than their peers without these risk factors.

Fortunately, despite the high prevalence of caries in women and children, this disease is readily preventable or manageable through early and regular dental care, exposure to fluoridated water, use of appropriate topical fluorides including those in toothpastes, application of sealants to primary teeth, and adoption of a health-promoting diet like that suggested in the Dietary Guidelines for Americans.⁹

ODONTOGENIC INFECTIONS

Although pregnant patients are usually not immunocompromised, the maternal immune system

does become suppressed. As such, there is a decrease in cell-mediated immunity and natural killer cell activity. Consequently, odontogenic infections have the potential to develop rapidly into deep-space infections and to compromise the oral-pharyngeal airway. Hence odontogenic infection should be treated promptly at any time during pregnancy.¹

Abscesses should be drained and the offending pulp extirpated or the tooth removed to control the infection. The obstetrician should be informed of the patient's status and the planned course of and rationale for treatment discussed. Patients who are in acute dental pain should be cared for in a similar manner. Long-term use of analgesics instead of definitive treatment is inappropriate. The patient should not have to wait until after delivery before treatment is provided.¹

PTYALISM IN PREGNANCY

Ptyalism (excessive secretion of saliva) is a complication of pregnancy that occurs most often in women suffering from nausea. The presence of excessive saliva in the mouth may also reflect the inability of nauseated women to swallow normal amounts of saliva rather than a true increase in production. Reducing the consumption of complex carbohydrates may improve this condition.¹

ENAMEL EROSION IN PREGNANCY

The increase in progesterone levels during pregnancy causes a decrease in lower esophageal tone and gastric and intestinal motility. The combined effect of hormonal and mechanical changes in the gastrointestinal system and greater sensitivity of the gag reflex also increases the risk of gastric acid reflux. This results in increased risk of enamel erosion of especially upper anterior teeth.¹

GENERAL CONSIDERATIONS DURING DENTAL TREATMENT OF PREGNANT PATIENTS

The evaluation and management of pregnant patients may require special consideration but does not preclude them from necessary dental care. Any treatment should be directed toward controlling disease, maintaining a healthy oral environment and preventing potential problems that could occur later in the pregnancy or during the postpartum period.²

Obstetric consultation is usually not required before initiating dental treatment for normal, healthy pregnant

patients. However, consultation should be sought before caring for patients who have been identified by the obstetrician as being at risk for pregnancy complications, such as those with pregnancy-induced hypertension, gestational diabetes, threat of spontaneous abortion or history of premature labour. High-risk pregnant patients can usually be identified by taking a good medical history and asking questions about the course and nature of the pregnancy. Careful measurement and recording of baseline blood pressure, pulse and respiratory rate are required before any invasive procedure, including administration of a local anesthetic. Blood pressure is often at or below the range expected for healthy women of childbearing age. If blood pressure is repeatedly elevated, especially above 140/90 mmHg, and fear and pain can be ruled out as causes, the obstetrician should be notified.¹

TIMING OF TREATMENT

A common concern is timing of necessary procedures. The trimester approach is safe for both mother and patient. During the first trimester, the patient should be scheduled to assess the current dental health, to inform the patient of changes she would expect during pregnancy, and to discuss how to avoid maternal dental problems that may arise from these changes.¹⁰

Coronal scaling, polishing and root planing may be performed at any time as required to maintain oral health. However, routine general dentistry should usually only be done in the second and third trimester of pregnancy. During the first trimester the developing child is at greater risk posed by teratogens and spontaneous abortion. Organogenesis is completed by the end of the first trimester, and uterine size has not increased to the extent that sitting in the dental chair is uncomfortable. Moreover, nausea has generally ceased by the end of the first trimester. Extensive elective procedures should be postponed until after delivery.² The appointments during pregnancy should be of as short periods as possible.

POSITIONING OF PATIENT ON DENTAL CHAIR

The positioning of pregnant patient is important, especially during the third trimester. As the uterus expands with growing fetus and placenta it comes to directly over the inferior vena cava, femoral vessels and aorta. If the mother is positioned supine for a procedure, the weight of the gravid uterus could apply enough pressure to impede blood flow through these major

vessels secondary to which the blood pressure drops causing syncopal or near syncopal episode. This condition is called as supine hypotension. This can be prevented by proper positioning of patient on her left side and elevating the head of the chair to avoid compression of major vessels.¹⁰

RADIOGRAPHY

Embryos and fetuses are considerably more radiosensitive than adults because most embryonic cells are relatively undifferentiated and rapidly. Prenatal irradiation may lead to death or specific developmental abnormalities depending on stage of development during irradiation. The most sensitive period is during the period of organogenesis, between 18 and 45 days of gestation.¹¹

Oral radiography is safe for pregnant patients, provided protective measures such high-speed film, a lead apron and a thyroid collar are used. No increase in congenital anomalies or intrauterine growth retardation has been reported for x-ray radiation exposure during pregnancy totalling less than 5–10 cGy, and a full-mouth series of dental radiographs results in only 8×10^{-4} cGy.¹ A bitewing and panoramic radiographic study generates about one-third the radiation exposure associated with a full-mouth series with E-speed film and a rectangular collimated beam.¹²

Patients who are concerned about radiography during pregnancy should be reassured that in all cases requiring such imaging, the dental staff will practice the ALARA (As Low As Reasonably Achievable) principle and that only radiographs necessary for diagnosis will be obtained.¹

MEDICATIONS

The risk of fetal injury and malformation is of primary concern when prescribing medication to pregnant patients. It is best to take a conservative approach and with attention paid to FDA classification and referral to patient's obstetrician when there is any doubt about the teratogenic effects of a medication.

Oral infections have the potential to cause bacteremia and sepsis, resulting in fatal complications, making antibacterial treatment important in pregnant patients. The penicillin, amoxicillin and cephalosporins are generally considered to be safe for use in pregnant patient. For penicillin allergy, erythromycin can be used. Erythromycin base is considered to be safe, but estolate form is contraindicated because of its known increased

risk of cholestatic hepatitis during pregnancy. Tetracyclines including doxycycline are contraindicated during pregnancy because of their effect on developing teeth and bones. Chloramphenicol is also contraindicated during pregnancy, and metronidazole should not be prescribed because of its carcinogenic effects on rodents.

Acetaminophen is generally considered safe during pregnancy, but for severe pain Acetaminophen with oxycodone should be used as opposed to Acetaminophen with codeine since codeine has been found to be teratogenic. Some believe that aspirin and ibuprofen including other NSAID should not be used during pregnancy since they believe these drugs to prolong pregnancy and labor. Also their effect on impairing the platelet function and thus prolonging bleeding time can cause antepartum and postpartum hemorrhage when used in third trimester. Aspirin is known to cause increased cases of oral clefts and other defects. Aspirin and ibuprofen inhibit prostaglandins and there is a potential for premature closure of ductus arterioles, increasing the fetal mortality. It is advisable to use Acetaminophen as drug of choice with referral to a patient's obstetrician before prescribing an NSAID. Narcotics cause respiratory depression in both fetus and mother. Prolonged use of narcotics by the mother can evoke an addiction in fetus.¹⁰

CONCLUSION

Attention to woman's dental health should continue throughout pregnancy. Paying attention to the physiologic changes associated with pregnancy, practicing careful radiation hygiene measures, prescribing medications on the basis of drug safety categories and timing appointments and aggressive management of oral infection appropriately are important considerations. Undertaking the proper precautions not only provides the best dental care, but also helps to avoid potential complication. Any complication or question arises with a pregnant patient should prompt referral to patient's obstetrician.

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A Study of Prevalence and Risk Factors of Adenomyosis at Hysterectomy

Ramesh B H¹, Shashikala P², Doddikoppad³, Chandrasekhar H R³

¹Associate Professor, Department of Pathology, Mysore Medical College and Research Institute, Mysore, ²Professor and Head, S.S.Institute of Medical Sciences and Research Centre, Davangere, ³Professor, Department of Pathology, J.J.M. Medical College, Davangere, Karnataka, India

ABSTRACT

Background: Adenomyosis is a frequent entity, with difficult diagnosis, often obtained by pathological analysis performed after hysterectomy. This condition can cause abnormal uterine bleeding and dysmenorrhoea, frequent reasons for consultation and hysterectomy.

Aim: The present study sought to evaluate the clinical profile of adenomyosis

Materials and Methods: The data in this study have been derived from 896 hysterectomies performed at J.J.M Medical College, Davangere, for a period of 2 years. Adenomyosis reported in 896 (49.04%) of 1827 uteri were included in the study irrespective of the preoperative diagnosis.

Results: Of the 1827 hysterectomy specimen received during the 2year period, adenomyosis was reported in 896 uteri (49.04%). Age of patients ranged from 20 - 75 years with a mean age of 39.8years. Peak incidence was seen in fourth decade. 892 patients were parous (99.55%). The parity ranged from one to ten. Menorrhagia was the commonest symptom.

Conclusion: Our findings do not support the notion that adenomyosis is more frequently related to particular clinical condition and suggest the association of parity with an increased frequency of adenomyosis.

Keywords: Adenomyosis, Parity, Symptoms

INTRODUCTION

Adenomyosis is a frequent entity, with difficult diagnosis, often obtained by pathological analysis performed after hysterectomy. This condition can cause abnormal uterine bleeding and dysmenorrhoea, frequent reasons for consultation and hysterectomy. The development of ultrasonographic and magnetic resonance imaging techniques allows preoperative diagnosis.

In reviewing the literature, adenomyosis is indeed an "elusive" lesion. There are several reasons for this.

First, the exact aetiology of adenomyosis is not known. Second, its precise incidence in surgical specimens is not known and variance between 8% - 40% is reported, depending on which study or text one reviews. Certain reviews reports a correct pre-operative diagnosis is less than 10% of the instances of proved adenomyosis¹.

In spite of the fact that it causes distressing and often serious functional disturbances requiring major operation for correction, many physicians, even gynaecologists have only a passing acquaintance with this entity².

The present study was an attempt in analyzing the clinical profile of adenomyosis

Corresponding author:

Ramesh B H

Associate Professor

No 17,3rd cross, KN extension.

Triveni Road.Yeshwantpur.

BANGALORE- 22

E-mail: rameshpath@rediffmail.com.

Mobile: +917411159287

SUBJECT AND METHOD

During the study period of 2years, 1827hysterectomy specimens were received in the department of pathology J.J.M Medical College, Davangere.

Adenomyosis reported in 896(49.04%) uteri irrespective of the preoperative diagnosis were included in the study. The diagnostic criteria used in the identification was the presence of endometrial glands & stroma at least one low power field below the basal layer of endometrium surrounded by myometrium.

These pathologic results were then reviewed and analyzed according to age, parity and clinical presentation.

RESULTS

Of the 1827 hysterectomy specimen received during the 2year period, adenomyosis was reported in 896 uteri (49.04%).

Age of patients ranged from 20 - 75 years. Majority of patients were in 4th & 5th decade with peak age incidence in 4th (48.43%) decade. The mean age was 39.8% (Table 1).

Table 1: Age Distribution

Age (years)	Number	Percentage
11-20	002	00.22
21-30	152	16.96
31-40	434	48.43
41-50	228	25.44
51-60	064	07.15
61-70	014	01.57
>70	002	00.23
Total	896	100.00

The mean age was 39.8years

The parity ranged from one to ten. 896 patients were parous (99.55%) and only four were nulliparous (Table 2).

Table 2: Parity Distribution

Parity	No. of Cases	Percentage
0	004	00.45
1	019	02.12
2	249	27.79
3	330	36.83
4	157	17.52
>4	137	15.29
Total	896	100.00

Menorrhagia was the commonest symptom which was observed in 453 patients (50.55%) followed by

dysmenorrhoea in 387(43.19%) patients, polymenorrhagia (1.1%), Metrorrhagia (1.04%), mass per vagina (1.1%), WDPV in 0.9%, lower abdomen pain in 1.1%, post coital bleeding in 0.79% and post menopausal bleeding noticed in 2(0.23%) patients (Table-3).

Table 3 Clinical presentation in cases of Adenomyosis

Clinical symptom	Number	Percentage
Menorrhagia	453	50.55
Dysmenorrhoea	387	43.19
Polymenorrhagia	010	01.10
Metrorrhagia	009	01.04
Mass per vagina	010	01.10
WDPV	008	00.90
lower abdominal pain	010	01.10
post coital bleeding	007	00.79
post menopausal bleeding	002	00.23
Total	896	100.00

DISCUSSION

The true incidence of adenomyosis is unknown. The frequency of adenomyosis reported in the literature ranges widely from 5 to 70%. The incidence of adenomyosis in the present study was 49.04% and preoperative clinical diagnosis of adenomyosis was done in only 31 cases (3.46%) similar to other studies¹⁻⁴.

AGE/PARITY

In the present study the peak age incidence of adenomyosis was in fourth and fifth decades (73.88%) which are in accordance with other studies^{1-3, 5}. Adenomyosis typically affects multiparous patients^{1,9}. In our study, most of the patients were multiparous (99.55%) as comparable to other studies^{2, 3, 5, 6}. The overwhelming population of parous patients in various studies lends support to the concept that child bearing may play a role in the aetiology of adenomyosis².

SYMPTOMS

The symptom association with adenomyosis is excessive uterine bleeding accompanied by worsening dysmenorrhoea. However adenomyosis may be entirely asymptomatic^{1,9}. In the present study, incidence of menorrhagia in patients with adenomyosis was 50.55% similar to other studies^{3,7}. Dysmenorrhoea from present study correlates with other studies^{1-3,8,7}. As with other

studies in the present study reported symptoms in cases of adenomyosis were heterogenous, nonspecific and probably related to the associated diseases⁴.

In conclusion our findings do not support the notion that adenomyosis is more frequently related to particular clinical condition and suggest the association of parity with an increased frequency of adenomyosis.

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Impact of Accessibility to Dental Schools on Oral Health Status of North Indian Children Population

Rashi Chaturvedi¹, Vyom Aggarwal², Chinu Goyal², Ashish Jain³

¹Reader, Department of Periodontics, Dr. H.S. J. Institute of Dental Sciences & Hospital, Panjab University, Chandigarh, India, ²B.D.S., Swami Devi Dayal Hospital and Dental College, Barwala, ³Professor and Head, Department of Periodontics, Dr. H.S. J. Institute of Dental Sciences & Hospital, Panjab University, Chandigarh, India

ABSTRACT

Developing countries all over the world face a multitude of challenges in overcoming various barriers and providing access to oral health care services to the rural and remote population. These areas are maximally affected in achieving oral health care, due to shortage of manpower, resources and distance from established dental set-ups. This study was carried out with the primary purpose of understanding the impact of accessibility to dental schools on the oral health status and oral hygiene awareness of a sample population. A total of 374 subjects were evaluated in the age range of 9-11yr, 12-13 yrs and 14-15 yrs, out of which 187 subjects having access to dental schools were assessed for various parameters and compared to an equal number of age matched controls living far away from dental schools. Results showed a poorer oral health status and oral hygiene awareness amongst the children residing far away from dental schools as compared to those residing near dental schools. Age wise comparisons indicated a poorer oral hygiene amongst the 14-15 year olds with a higher treatment need as compared to the younger age groups.

Keywords: Dental Education, Oral Health Care Access, Dental Workforce, Outreach Teaching

INTRODUCTION

India as a developing country faces a multitude of challenges in rendering oral health care to its masses. However, a number of barriers exist in providing access to oral health care. These include shortage of dental health professionals in underserved areas, inadequate financial resources, social and economic barriers, patient care perceived, actual need for care and the availability to these services ¹. The rural areas where 72% of the population resides have a limited access to oral health care due to significant under-representation of dentists in these areas and primary health care systems which are not prepared to deal with the oral health issues ^{2,3}. Illiteracy predominates leading to neglect of oral health. Moreover inadequate financial resources and lack of transport facilities further deteriorate their chances of accessing oral health care.

Academic dental institutes can through their integrated community outreach training involving compulsory rural postings and regular organization of dental camps in the vicinity of the institutes help provide oral health care to the masses ^{4,5,6,7}. Young children from the relatively lower socio-economic status should be targeted for preventive strategies in oral health care. The

policy regulators in India are making conscious efforts to establish and promote dental schools in rural and remote areas. It is the need of the hour to do an objective survey to ascertain the outcomes of the activities of the dental schools.

The present study aims at highlighting the impact of accessibility to dental care based on the distance from dental schools, on the oral health status and oral hygiene awareness of a sample population.

SUBJECTS AND METHOD

Six government schools from the Raipurani district of India; three of which were located at a distance of less than 2.5 miles from a dental school and three of which were located at a distance of greater than 6.5 miles from a dental school were included in the survey. A total strength of 374 subjects in the age groups of 9-15 yrs was examined for their oral health status and awareness. Out of this total, 187 subjects were those residing close to dental schools and an equal number residing far away from dental schools. The students in each of the three schools of the near group were stratified into three groups of 9-11yrs, 12-13 yrs and 14-15 yrs and samples were selected randomly from each stratum

giving us a sample size of 187. Similarly, an equal age and gender matched sample was obtained from schools located far away from dental schools. Ethical clearance for conducting this survey was obtained from the ethical committee of Swami Devi Dayal Dental College and Hospital, Barwala, Panchkula, India. An informed consent was obtained from the district office of education of Raipurani district. The data was collected based on a oral health assessment performa. All these students were examined by same two examiners who were calibrated prior to the initiation of the survey to control the examiner variability. The statistical analysis was carried out using statistical package for social sciences (SPSS Inc., Chicago, IL, version 15.0 for Windows). All quantitative variables were estimated using measures of central location (mean, median) and measures of dispersion (standard deviation). Normality of data was checked by measures of skewness and Kolmogorov Smirnov tests of normality. As the data was not normally distributed, hence quantitative data was compared using Mann-Whitney test for two groups. Categorical variables were described as frequencies and proportions. Proportions were compared using Chi square or Fisher's exact test whichever was applicable. All statistical tests were two-sided and performed at a significance level of $\alpha=0.05$.

RESULTS

The results showed that both the groups were evenly matched for age and gender. 19.3% of subjects in the near group brushed twice a day as compared to 0% in the far group. 7% of the subjects in the far group brushed only once a week as against 0% in the near group. Occasional cleaning was seen in 20.3% of subjects in the far group as compared to 7% in the near group. All this data had statistical significance. Regarding oral health awareness; 23.5% of the subjects from the near group visited the dentists as against 9.1% of subjects from the far group which was found to be statistically significant. (Table 1)

Table 1. Comparison of categorical data between subjects residing near & far away from dental schools

Parameter	Variables	'p'
Gender	Male	1.000
	Female	
Age	9-11yrs	1.000
	12-13yrs	
	14-15yrs	
Cleaning	Brush	0.521
	Datun	
	Finger	

Table 1. Comparison of categorical data between subjects residing near & far away from dental schools (Contd.)

Parameter	Variables	'p'
Material	Nil	0.357
	Paste	
	Powder	
Frequency	Alternate days	0.123
	Occasionally	0.0001**
	Once	0.488
	Once a week	0.0002**
	Twice	<.0001**
Time	Evening	1.000
	Morning +Eve	<0.0001**
	Morning	<0.0001**
	Occasional	0.001**
Method	Hor+Vert	0.008**
	Horizontal	0.003**
	Vertical	1.000
Visit to dentist	No	<.001**
	Yes	
Heard of Plaque	No	.008**
	Yes	
Treatment Need	No	0.058
	Yes	
Mucosa	4	.192
	4,1	
	4,2	
	7,4	
	Normal	
Extra-oral	1	1.000
	Normal	
TMJ Symptom	44	1.000
	No	
TMJ sign	No	1.000
	Yes	
Prosthetic status	No	-
	Yes	
Prosthetic need	No	-
	Yes	
Trauma	0	.360
	1	
	2	

Regarding the data on dentitional status, oral hygiene levels, caries, treatment needs etc, the results showed that the OHIS , gingival index , presence of decayed teeth were higher in the population residing far away and the difference was statistically significant. The presence of filled teeth was higher in the near group subjects and the difference with the far group was statistically significant. Regarding the need for two or

more surface fillings, presence of lesions requiring crown placements and need for extraction a statistically

higher number of subjects were seen in the far group. (Table 2)

Table 2. Comparison of continuous quantitative data between subjects residing near & far away from dental schools

Group		OHIS	Gingival Index	Decayed	Missing	Filled	Sealant	One Surface Filling	Two or More	Pulp Care	Crown	Extrn
Far	Mean	1.5693	1.064	1.63	.01	.06	.61	.54	.47	.24	.06	.34
	Std. Dev.	.57652	.3977	1.323	.073	.236	1.441	.778	.624	.603	.278	.725
Near	Mean	1.0854	.512	1.47	.01	.25	.49	1.00	.16	.14	.02	.14
	Std. Dev.	.51152	.4277	1.644	.073	.562	1.317	1.256	.546	.477	.163	.477
'p'		<.001**	<.001**	.012*	1.000	<.001**	.380	.001**	<.001**	.063	.033*	.001**

Next comparisons were done between the two groups (far v/s near) on the same parameters based on an age wise distribution of subjects. Highly significant results were found for the frequency of tooth brushing; in the age range of 9-11 yrs, as there were 22.7% of children in the near group who brushed twice a day compared to 0% in the far group. Similarly, in the 12-13yrs age group, 20.9% children in the far group as against 6.6% in the near group brushed occasionally.

In the same age range the 17.6% of the subjects of the near group as compared to 0% in the far group brushed twice a day. Regarding oral health awareness, children in both the age ranges 9-11 and 12-13 yrs in the near group had significantly greater visits to the dentist as compared to the far group. Amongst the 14-15 yr olds 100% of the children in the far group needed treatment as against 80% in the near group and this difference was statistically significant. (Table 3)

Table 3. Comparison of various parameters on the basis of age wise distribution

		9-11yr	12-13yr	14-15yr
Parameter	Variables	'p'	'p'	'p'
Gender	Male	1.000	1.000	1.000
	Female			
Cleaning	Brush	0.495	0.512	0.601
	Datun			
	Finger			
Material	Nil	0.495	0.470	0.309
	Paste			
	Powder			
Frequency	Alternate days	0.496	0.497	0.039*
	Occasionally	0.188	0.005**	
	Once	0.052	0.189	0.067
	Once a week		0.003**	0.112
	Twice	<0.001**	<0.001**	0.052
Time	Evening	<.001**	<0.001**	0.036*
	Morning +Eve			
	Morning			
	Occasional			
Method	Hor+Vert	-	.015*	0.313
	Horizontal			
	Vertical			
Visit to dentist	No	0.026*	0.002**	0.347
	Yes			
Heard of Plaque	No	0.095	0.100	0.667
	Yes			
Treatment Need	No	0.457	0.375	0.024*
	Yes			

Table 3. Comparison of various parameters on the basis of age wise distribution (Contd.)

		9-11yr	12-13yr	14-15yr
Mucosa	4	0.315	0.218	0.355
	4,1			
	4,2			
	7,4			
	Normal			
Extra-oral	1	1.000		-
	Normal			
TMJ Symptom	44	1.000		-
	No			
TMJ sign	No		1.000	-
	Yes			
Prosthetic status	No			-
	Yes			
Prosthetic need	No			-
	Yes			
Trauma	0		0.497	1.000
	1			
	2			

Regarding the quantitative data on assessment of oral hygiene status it was seen that the OHIS and Gingival index was higher in the far group for all age ranges with differences with the near group being

statistically significant. For decayed teeth, significant difference in the two groups was seen for 12-13yrs and 14-15 yrs only. Filled teeth were more in the near group of 9-11 yrs and 12-13 yr olds. (*Table 4*)

Table 4. Comparison of various quantitative parameters on the basis of age wise distribution

Group		OHIS	Gingival Index	Decayed	Missing	Filled	Sealant	One Surface Filling	Two or More	Pulp Care	Crown	Extrn
9-11	'p'	.001**	<0.001**	.835	1.000	.039	.595	.065	.385	.101	1.000	.117
12-13		<0.001**	<0.001**	.036*	.317	<0.001**	.478	.135	<0.001**	.542	.009**	.004**
14-15		.001**	<0.001**	.04*	.317	.700	1.000	.005**	<0.001**	.490	.317	.126

Intra-group comparisons based on an age wise distribution in each group revealed that the treatment needs of the 14-15 yr olds in the far group were higher than the 9-11 yrs and 12-13 yr olds. Also the 14-15 year olds despite having a higher level of awareness had a higher OHIS and a greater need for two or more surface fillings and this data was statistically significant.

DISCUSSION

India is a developing country and has more than 72% of its population still residing in rural and remote areas where even the basic amenities of health care are sparse. Socioeconomic and financial barriers are so strong that coupled with the illiteracy, the provision for health care is severely lacking. Distances of even up-to 10 kms (6.5 miles) are un-surmountable due to lack of availability of any modes of private or public transportation. To provide oral health care to these

masses we need to impart them knowledge so as to enhance their awareness and then make efforts to provide facilities at their doorstep. There is also a dearth of properly trained private dental practioners in this area and even those remotely located cannot cater to the needs of these financially poor residents ^{2,3}.

The results of the present study showed that children residing in areas or studying in schools located close to the dental colleges had higher oral health awareness and a better oral health status as compared to children residing far away from such institutions. The OHIS, gingival index, decayed teeth, requirement of two or more surface fillings, need for crowns and extractions was higher in the children living far away from dental schools as compared to those residing close by. Assessment of this data on an age-wise parameter showed that the 14-15 yr olds had a greater awareness about oral health and made an effort to visit the dental setups to seek treatment as

compared to the younger age groups. The oral health awareness of the 9-11 and 12-13 yr olds was more in the children residing close to dental institutions as compared to those residing far away. This indicated that with increasing age the oral health awareness improved and therefore a need to enhance the oral health knowledge and awareness to the younger children exists. However, amongst the children having limited access to dental schools, despite the higher degree of awareness, the oral hygiene status as well as treatment needs of the 14-15 year olds is higher as compared to the younger age groups. This indicated that not only is there a requirement to make efforts to impart knowledge and enhance awareness about oral health care, but also provide facilities to access health care. A similar study carried out in a rural Indian setting showed a higher prevalence of periodontal disease amongst the adult population due to barriers in accessing oral health care services⁸. Another study carried out in a field practice area of a village in India showed that out of the 75% of the population requiring dental treatment, only 22% perceived the need indicating a strong lack of awareness⁹. From an international viewpoint too, challenges in providing access to oral health care to the rural population exist. A study on the rural and remotely residing aged population in Australia showed a definite decline in the visit to the dentists owing primarily to financial barriers and lack of perceived need for treatment¹⁰. Similar challenges have been seen in delivering oral health services to rural America where the population shows a higher incidence of dental problems and lower utilization of services due to various barriers that affect accessibility¹¹.

Dental institutions play a pivotal role in addressing the oral health needs of the underserved population. Dental school administration can co-ordinate with the local government officials for effective oral health promotion & service provision. Hence utilization of oral health care services in our country largely depends on the accessibility to major dental schools and associated hospitals. Problems with access have been shown to influence the utilization of services.

Dental council of India has taken an initiative to streamline the national dental workforce and aims at providing access for all. Dental manpower committee report of dental council of India (2003) showed that there were approximately 44,000 dentists for a 100 million population of ours with a dentist population ratio of 1: 30,000 in the urban areas and 1: 2,000,000 in the rural population¹². In 2007, the government of India in collaboration with the WHO laid down certain regulations for effective utilization of dental workforce to enhance access to health care¹³. Dental colleges can explore and utilise the special provision of funds available with the planning commission for such projects for adoption of one district by a dental college community. However, there still exists a need to open new dental schools

in the rural areas to extend these benefits to the masses. In view of the global motto of providing service learning and assessing oral health needs, the data obtained from this survey hopes to guide the governing authorities to formulate future policies on the relocations of existing schools as well as opening new schools in the underserved areas to facilitate the population there. Similar kind of surveys can then serve as an outcome measure of these parameters.

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Study of Prevalence, Sex Ratio and Different Level of Intellectual Disability in Haryana

Minakshi Vashist¹, Ritu Yadav², Shiksha Sharma³

¹ Associate Professor, ² Assistant Professor, ³ Research Scholar, Department of Genetics, Maharshi Dayanand University, Rohtak, Haryana (India)

ABSTRACT

Intellectual disability is a life long disability that presents in infancy or the early childhood years but it cannot be diagnosed until the child is older than 5 years, when standardized measures of intelligence become reliable and valid. Five hundred intellectual disabled persons have been evaluated from different districts of Haryana state in present study. Questionnaire has been developed for the different level of intellectual disability, sex ratio, age of child as well as order of birth and diagnosis age were recorded. IQ was determined by Seguin board test. 54% moderate, 27.6% mild, 18.4% severe intellectual disability was found in present study. Prevalence higher in males (78.4%) as compared to females (21.6%). Age of Diagnosis is different in different level of intellectual disability. Maximum persons were of second order, followed by 1st order in family.

Keywords: Intellectual Disability, Diagnosis Age, IQ

INTRODUCTION

Intellectual disability is a common disorder & affects 1-3% of the population¹. The prevalence and incidence of intellectual disability have been affected by changes in the definition of intellectual disability, societal attitudes regarding the acceptance and treatment of an individual with intellectual disability. It is one of the most frequent handicaps among children and can be a serious life long disability placing heavy demands on the society and the Health System^{2,3}.

There are strong associations between prevalence of intellectual disability and variables malnutrition, traumatic brain injury and postnatal brain infection that causes brain disorder and cognitive impairment of children being at greater risk⁴. This calls for genetic epidemiological studies to identify contribution of specific recessively inherited forms of intellectual disability.

A variety of disorders associated with intellectual disability epilepsy, cerebral palsy, vision and hearing

impairments, speech/language problems and behavior problems⁵. The number of associated disorder increase with the level of severity of intellectual disability⁶.

Study of prevalence of intellectual disability is the first step in developing effective rehabilitation and educational programs for sufferer as well as appropriate prevention programs for those at risk. Effective prevention requires better information on risk factors and causes than is currently available for population in the less developed works⁷.

Diagnosis is highly dependent on a comprehensive personal and family medical history, a complete physical examination and a careful developmental assessment of the child. These will guide appropriate evaluations and referrals to provide genetic counseling, resources for the family and early intervention programs for the child⁸. Improvements in medical care & technology and the expansion of educational services to children with disabilities also affected the incidences & prevalence rate of intellectual disability.

MATERIAL AND METHOD

Five hundred intellectual disabled persons from different districts of Haryana state have been evaluated in the present study. Questionnaire has been developed for the different level of intellectual disability, sex ratio, order of birth and diagnosis age. Cognitive functioning

Corresponding author:

Ritu Yadav

Assistant Professor,

Dept. of Genetics, M.D. University, Rohtak, Haryana

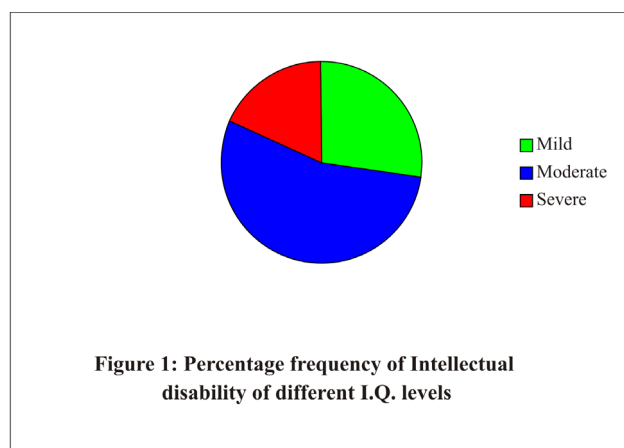
E mail: ritugenetics@gmail.com

Ph. No: 09466383538

(IQ) level was determined using Seguin form board test. All the intellectual disable persons were categorized into four classes on the basis of degree of intellectual disability. WHO system of classification⁹ was followed to define the categories. The degree of impairment in intellectual disability has a wide range from profoundly impaired to mild or border line retardation. Individuals with IQ between 51-70 were kept in mild intellectual disability group, 36-50 in moderate group, 21-35 in severe intellectual disability group and IQ less than 20 were kept in profound intellectual disability group in accordance with international standards. Collected data was tabulated and finding was described in percentage frequency. Chi-square and two way ANOVA test applied for the difference between the proportions.

RESULTS

In present study, 54 moderate, 27.6 mild, 18.4% severe persons of intellectual disability were found (Figure -1). Moderate level of intellectual disability showed maximum percentage frequency. No person of profound intellectual disability was found in the present study.



Sex ratio and IQ level of intellectual disabled persons revealed prevalence of intellectual disable males. In this study, 78.4 males and 21.6% of females were found. In females, 15.8 moderate, 2.4 mild and 3.4% in severe intellectual disability were found. Male with intellectual disability showed 25.2% mild and 15% in severe group. Moderate group showed highest frequency (38.2%) of intellectual disability. χ^2 value revealed a significant association between IQ level and sex ratio of intellectual disable persons ($df = 2, p > .001$). (Table-1).

Table 1. Percentage frequency of Sex ratio in different levels of Intellectual disability

Different levels of mental retardation	Male	Female
Mild	25.2	2.4
Moderate	38.2	15.8
Severe	15.0	3.4
Total	78.4	21.6

$$\chi^2 = 23.4, df = 2, p > .001 \text{ level}$$

In age of diagnosis of intellectual disabled persons, 11.6% cases diagnosed at the time of birth, 18.4 % cases to one year and 34.6% diagnosed from one to four years of age. In four to ten years, 45.4 % intellectual disabled persons were detected. In present study, 13 mild, 25 moderate and 20 severe intellectual disabled persons diagnosed at time of birth. Persons with severe group were diagnosed up to 4 yrs, whereas mild and moderate group were diagnosed even after 8 yrs (Figure-2). Two way ANOVA test was applied to find out the association between IQ level and age of diagnosis of intellectual disabled persons. The value of F was significant at 5% level for degree of freedom 2 and 14. Value of F was insignificant for degree of freedom 7 and 14 (Table-2). Birth order of intellectual disabled persons in the family showed the variation from first to sixth. Maximum person were of second order, followed by 1st order with 25.66% cases. Subsequent orders had decreasing number from third to sixth order (Figure-3).

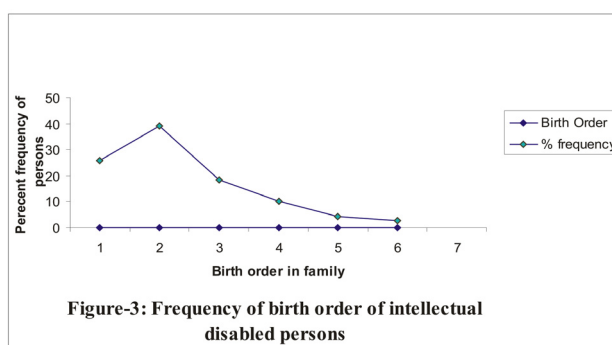
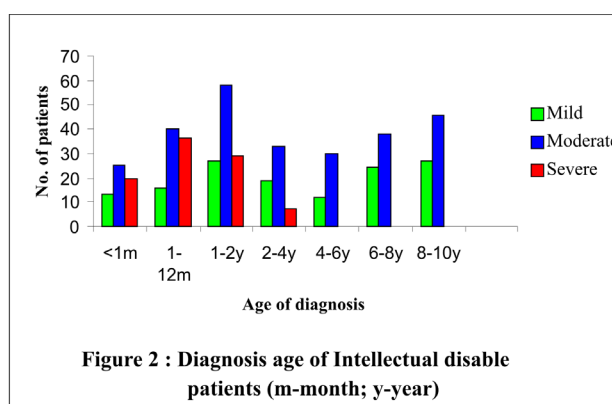


Table 2: ANOVA between age of diagnosis and different IQ level of Intellectual disability

Square of variation	Sum of square	Degree of freedom	Mean square	F-value
Between columns (diagnosis age)	8386.16	7	1198.02	0.25
Between rows (I.Q.)	8240.7	2	4120.35	8.60*
Residual	6703.8	14	478.84	-
Total	23330.66	23	-	-

* Significant at 5% level.

DISCUSSION

Moderate level of intellectual disability was of maximum percentage (54%) in present study. Reported prevalence of moderate to severe intellectual disability was 30 to 55 per 10,000 and of mild handicap 2% of the population¹⁰. Reports from Yokohoma city revealed 75 mild and 262 severe /moderate persons of intellectual disability¹¹. Study from Finland found the intellectual disability 77 in severe and 74 in mild persons¹². Prevalence of severe 19.5/1000 and mild level of intellectual disability as (65. 3/1000) was reported in Pakistan⁴. Studies from Bangladesh reported prevalence of severe intellectual disability as 5.9/1000¹³.

In Norwegian, population based study of intellectual disability, the prevalence of severe intellectual disability as 79 (79/178) and mild to moderate 99(99/178) was reported¹⁴. The prevalence of intellectual disability in Beijing, china reported the percentage of mild, moderate, severe and profound 65.54, 20.97, 5.99 and 7.49% respectively¹⁵. In study of 1909 intellectual disabled persons, 304 (15.9%) were found to have profound and severe, 1060 (55.6%) had moderate, mild and 545 (28.5%) had borderline luidisability¹⁶. In Finland¹⁷, found that the cumulative incidence of intellectual disability of any severity was 12.6/1000. Other report from Finland revealed that the incidence varied from 5.5/ 1000 for mild and 7.4/1000 for moderate-severe level of intellectual disability¹⁸. In the U.S., the cumulative incidence was 9.1/1000¹⁹. Observed difference in the prevalence of mild, moderate and severe group may be due to variable risk factors including environment.

Determination of the sex ratios in the literature did not specify the gender distribution in relation to diagnosis. Present study revealed percentage frequency of 78.4 males and 21.6 females. Male to female ratios for mild Intellectual disability is ranging from 40% excess of males in the Netherlands to an 80% excess in Sweden²⁰. Higher male to female ratio was detected for all the three levels of intellectual disability, whereas studies from Finland reported almost equal male to

female ratio¹². Reports from California detected 1.7:1 sex ratio in persons with intellectual disability²¹. In a Korean study of intellectual disability, sex ratio was 1:0.6, there was 40% excess of males⁷. In another study male to female ratio for severe intellectual disability showed 20% excess of males. A survey of intellectual disabled persons in china revealed, the prevalence in male was higher than that in female, and it increased with age¹⁵. The prevalence of male 15.1 and female 9.1% was found in Zonguldak, Turkey¹⁶. More ever the higher male female ratio might reflect a difference in registration and identification procedures. However significant excess of affected males in the present study strongly suggest, additional potentially important contribution from non specific X linked intellectual disability.

In age of diagnosis, 11. 6% cases could be diagnosed at the time of birth, 52.8 % up to two years of age and 14.6% even after eight years of age. Most of the severe and moderate intellectual disability groups could be diagnosed before 4 years of age. However some of the moderate as well as mild intellectual disability cases could not be identified even up to eight years. Most specialty clinics do not make a diagnosis of intellectual disability until after 4 years of age unless delay is severe because standardized tests for children younger than 3 years can measure the cognitive development rather than intelligence and are therefore less predictive²². The age of diagnosis was between 6 and 18 in intellectual disable persons in Turkey .The findings between the severity and the age of diagnosis would be the result of the attitudes of families that the greater the severity ,the easier was the acceptance of this condition by the families¹⁶. Variation in diagnosis age may be due to lack of awareness of obstetricians and pediatricians to this diagnosis or reluctance of variability in the dysmorphic features of intellectual disabled persons, which are not as apparent at birth as is usually thought.

CONCLUSION

This Study on prevalence, sex ratio and different level of intellectual disability is important in diagnosis of intellectually disabled persons in society. Screening based on diagnosis age may led to early detection of moderately and severely retarded children. It may also help in establishment of various development screening programmes. This information on intellectual disability can be used for genetic counseling and pregnancy supervision. Future prospects can even go up to giving monitoring guidelines for the parents for screening purpose. Generating such database shall be very helpful to monitor possible cause in future and hence

decreasing the social and economical burden to the families and on the whole to the society.

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Giant Cell Tumor of Bone in Northern India -Incidence, Clinical Presentation, Radiology, Histopathology and Treatment Approach

Roopak Aggarwal¹, Geeta Deshmukh², Shaham Beg³, Rajni Prasad⁴, Geetika Khanna⁵, Neha Maheshwari⁶

¹Asst. Professor (Pathology), ²Professor (Pathology), S.M.S.&R Gr. Noida, ³Senior Resident (Pathology), ⁴Professor, CIO Lab, Pathology, ⁵Professor, CIO Lab, Pathology, VMMC and Safdarjung Hospital, New Delhi, ⁶Senior Resident, (Radiology), SMS & R, Gr. Noida

ABSTRACT

Giant cell tumor is relatively uncommon benign locally aggressive neoplasm. and is still a challenge to the Surgeons in the developing countries due to limited diagnostic and therapeutic facilities

Aim of study: This study was conducted to determine the clinical pattern of Giant cell tumors including their relative frequencies as per age and sex distributions, anatomical sites of occurrence, radiological features, histopathology features analysis and treatment approach in a tertiary care hospital of North India.

Materials and Method: This is a retrospective study of all the histopathologically confirmed Giant cell tumors seen at Safdarjung Hospital New Delhi and S.M.S. Greater Noida over a 9 year period. During this period total number of primary bone tumors were 1170. Out of these 128 were diagnosed as Giant Cell tumors and 108 cases were followed up and forms the basis of the study.

Results: Out of 108 patients there were 57 males and 51 females. Their ages ranging from 11 to 55 years with an average of 28 years. The most common sites of the lesions were the ends of long bones (90 cases), especially the distal femur (24 cases), proximal tibia (31 cases) and distal radius (11 cases). The histological pattern of giant cell tumor was rather uniform. The indispensable feature of giant cell tumor was, giant cell itself. Microscopic evidence of malignancy was found in one of our cases of giant cell tumour of recurred lesion. Various forms of treatment included were curettage, en-bloc resection and radiation.

Conclusion: Incidence of GCT was 9 % of all primary tumors. Microscopic evidence of malignancy was found in one of our cases of giant cell tumour of recurred lesion. Histological grading has little prognostic value. Benign histology does not necessarily relate to the clinical behavior of the tumor. Resection yielded the best result. Radiation therapy should be reserved for surgically inaccessible tumor because of high risk of recurrence and malignant transformation.

Keywords: Giant Cell Tumor; Histopathology, Multinucleated Giant Cell (MNGC)

INTRODUCTION

Coopers & Travers (1818)^[6] gave the description of a tumour which later on came to be known as 'giant cell tumour'. It was blood good (1923)^[7] who first

coined the term 'giant cell tumour'. Jaffe et al (1940)^[8] identified it from other less serious skeletal lesions which were arbitrarily associated with the presence of giant cells. Giant-cell tumors (GCTs) are dominated by multinucleated osteoclast-type giant cells, hence the synonym *osteoclastomas*. It is characterized by the presence of multinucleated giant cells (osteoclast-like cells)^[1] and stromal cells constitute the neoplastic cells, which are from an osteoblastic origin and are classified based on expression of osteoblast cell markers such as alkaline phosphatase and osteocalcin.^[2] In contrast, the mononuclear histiocytic cells (MNHC) and multinucleated giant cell (MNGC) fractions are

Corresponding author:

Roopak Aggarwal

Asst. Professor (Pathology)
1640, Sohan Ganj clock tower
Delhi-110007

Mobile-9871663366

Landline-01123855697

Email-drroopakaggarwal@yahoo.co.in

secondarily recruited and comprise the non-neoplastic cell population. They are derived from an osteoclast-monocyte lineage determined primarily by expression of CD68, a marker for monocytic precursor cells.^[3,4] In most patients tumors are slow to develop but may recur locally in as many as 50% of cases. In very rare instances this lesion has the potential for metastasis to the lung and in these cases the lung lesions may behave in an indolent fashion and even require no treatment.

MATERIALS AND METHOD

This is a retrospective study of 108 cases of GCT of bone, conducted over a period of 9 years (2003-2011) in Safdarjung hospital, New Delhi and SMS & R Gr. NOIDA (U.P)

The clinical aspects of each case were studied with regards to age, sex, symptoms and physical findings. The roentgen logical findings with particular reference to location of the tumor were also noted.

In our study out of 108 cases sent for histopathology diagnosis, there were 71 curetting fragments preserved in 10% formalin, 36 resection specimens and 1 biopsy specimen.

All H & E stained histopathology slides of 108 cases were reviewed by all the authors. Histopathology findings were noted and data were analyzed. Their treatment modalities were also evaluated and analyzed. Patients were followed for recurrence and metastasis.

RESULTS

In our study 57 patients were male and 51 females; 78% of the patients were in the third and fourth decade of life, with peak in the third decade. The mean age at diagnosis was 27.4 years (range 11-55 yrs).

The most common sites of the lesions were the ends of long bones (90 cases, 83.3%). Other sites were short bones of hands & feet (9 cases), sacrum & Ilium (7 cases), clavicle-1 and vertebrae-1. Sites of lesion in long bones as per frequency were tibia total -34 cases (31 proximal, and distal 4), femur total -27 cases (proximal-3, distal 24), radius total 14 cases (proximal 3, distal 11), Ulna 07 cases, Humerus-05, Fibula 03 cases. The most common site was knee joint.

The most common symptom was pain, which occurred in 88 of the 108 patients. It was most often mild and intermittent at the onset and later became persistent and of increasing severity. In 71 cases

swelling was noted by the patients. Other, less frequent symptoms and signs were weakness, instability or limitation of joint movement, limping and fever.

Roentgenographic findings: Radiographic study was done in all the (108) patients. The diagnostic radiologic findings were well defined lytic lesions in the epiphysis located eccentrically to the long axis. [Figure 1(a) & 1(b)]



1(a) Anteroposterior and lateral Radiograph GCT with extensive invasion of proximal tibia.



1(b)-GCT of 1st metatarsal showing the lytic lesion

Tumors were of sufficient size to expand the cortex and extended to the metaphysis but did not reach the diaphysis. Trabeculation or a soap bubble appearance within the tumor was present in most of cases.

In small bones, the radiological findings were lytic defect in bone with some degree of trabeculation. The cortex showed areas of destruction and the remaining cortex was thinned out.

The treatment options for giant cell tumor are aggressive curettage with bone grafting and En-bloc resection. In most giant cell tumor, control was achieved by aggressive curettage and bone grafting. En-bloc resection which requires sacrifice of the articular surface and a complex reconstruction procedure was performed in GCT found in the proximal fibula, radius, and distal ulna .and. GCTs which have already destroyed the cortex. Radiation therapy was received in one case which involved the D10 vertebrae; the patient had complete paraplegia with bed sores.

Table 1:

Treatment	No. of Patients Operated Upon	Recurrence
Curettage	71	15(21%)
En- block resection	36	3(8%)
Radiation therapy	01	–

Three patients in our series who presented with recurrence after curettage developed benign pulmonary metastasis.

Gross appearance: The lesions within the resected specimens were variably firm, rubbery or soft in consistency and red, brown, tan or yellow in color. [Figure 2(a)] Areas of fibrosis, necrosis and haemorrhage were common particularly within the inner portion of larger tumors [Figure 2(b)]

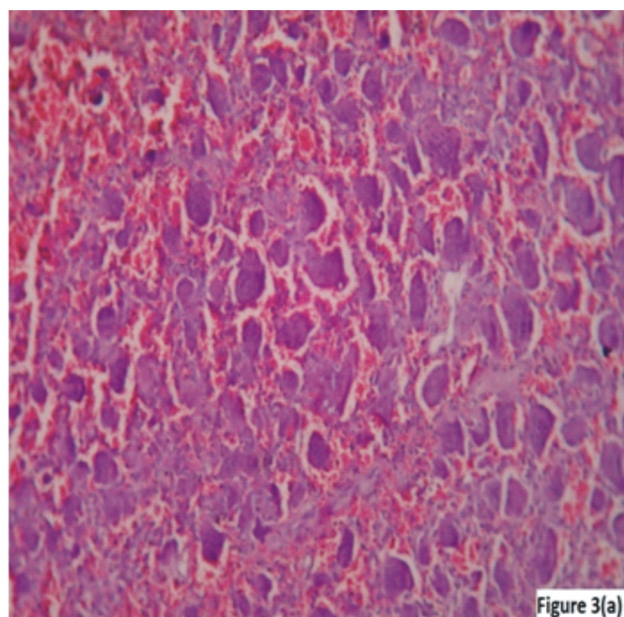


2(a) Large tumor of the proximal tibia with extensive cortical destruction

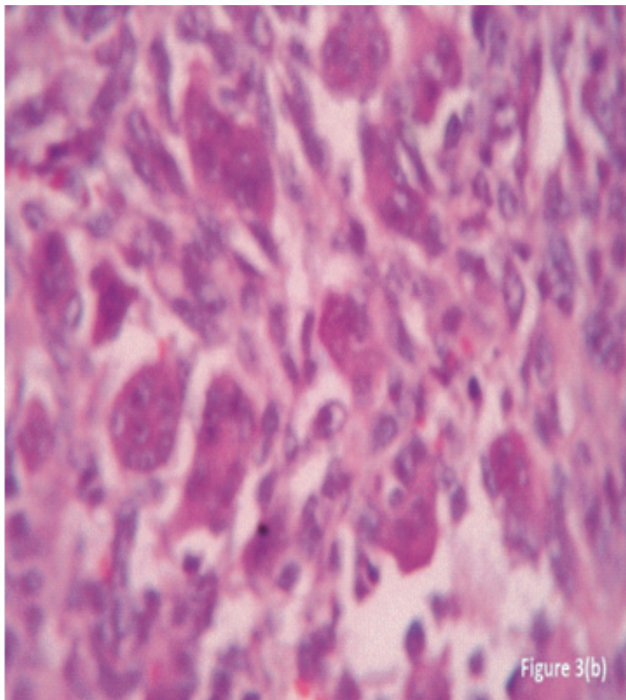


2(b) C/S- areas of fibrosis, haemorrhage & necrosis

The histological pattern of giant cell tumor was uniform.[Figure 3(a)]The indispensable feature of giant cell tumor was, multinucleated giant cell itself. This multinucleated giant cell contained discrete nuclei varying from 10 to 100 that tend to group together either centrally or eccentrically within the cytoplasm. Each nucleus contained a distinct small nucleolus. The giant cells of the tumors were the result of fusion of stromal cells. This was substantiated by the morphological identity of the nucleus of the giant cell with that of stromal cell. [Figure 3(b)]

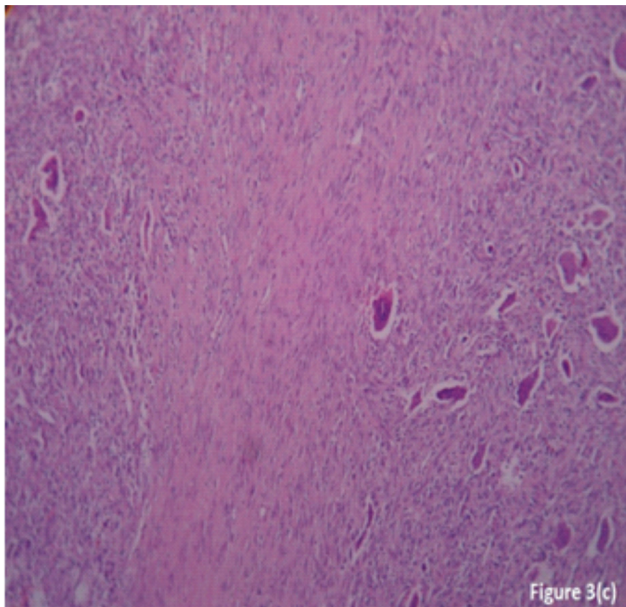


3(a) Typical microscopic appearance (100X)

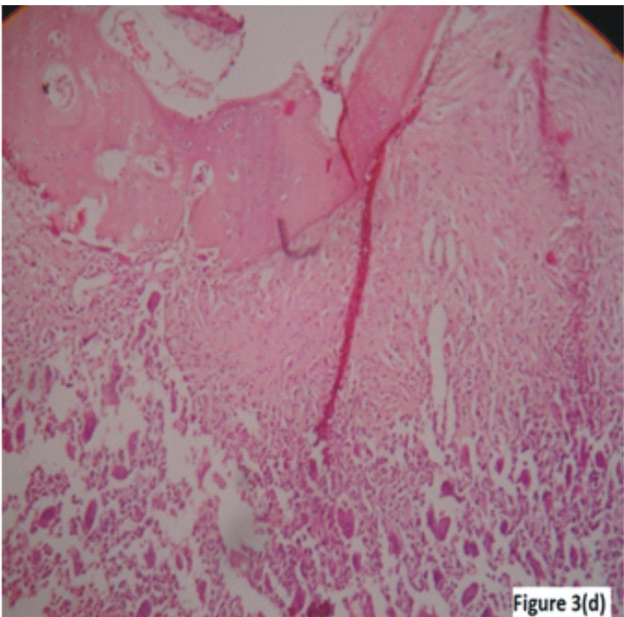


3(b) Stromal nuclei appear identical to giant cells (400X)

Transition of the stromal cells into spindle shaped fibroblast, which formed variable amount of collagen, was often identified.[Figure 3(c)] In portions of many of these tumors, the stromal cells transformed into osteoblasts that were enveloped within lacunae as well as applied to the surface of osteoid spicules.[Figure 3(d)]



3(c) GCT with fibrosis (100X)



3(d) Osteoid tissue being produced by altered stromal cells (100X)

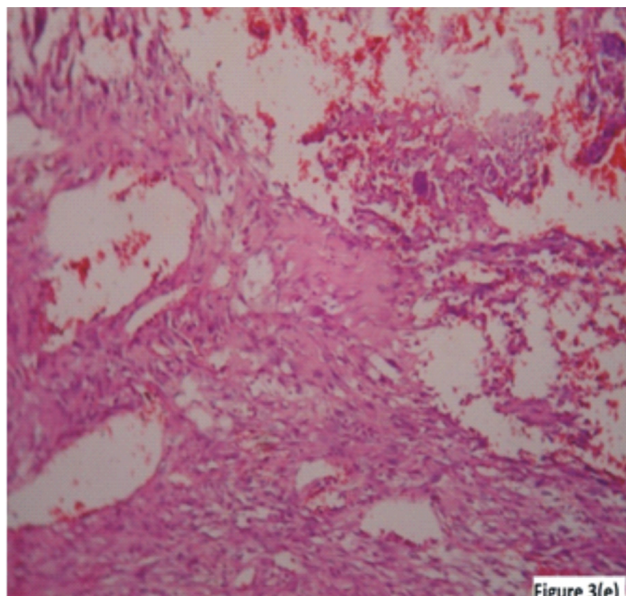
The pattern of the osteiod was regular and uniform. Atypical features and bizarre mitosis were not observed. A striking feature, in one third of cases, was the presence of intravascular plugs, particularly at the periphery of the tumour.

Giant cell tumor was associated with secondary aneurysmal bone cyst in 21 of our patients (14.7%). [Figure 3(e)]

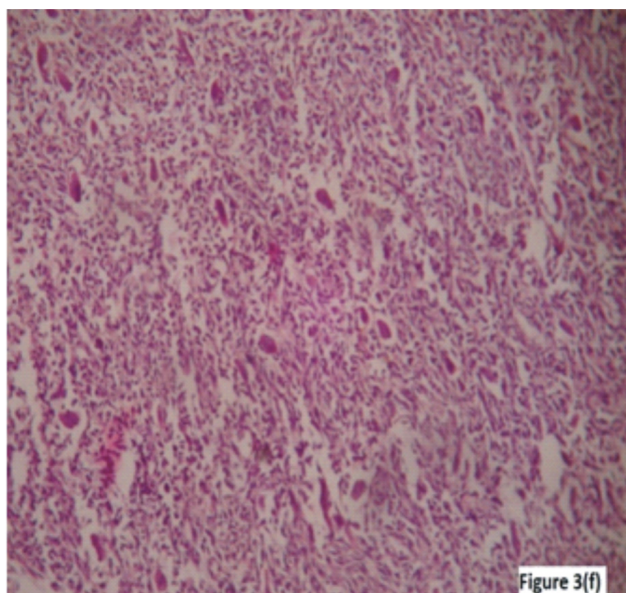
Table2:

Microscopic findings	% of cases
Multinucleated giant cells	100%
Mononuclear cells	100%
Fibroblast and collagen	72%
Necrosis, hemorrhage and hemosiderin deposition	28%
Reactive bone formation	12%
Secondary aneurysmal one cyst	14.7%

Microscopic evidence of malignancy was found in one of our cases of giant cell tumour of recurred lesion. The malignant GCT consists of spindle shaped cells loosely arranged in vascular framework. The nuclei are elongated and vesicular with a nucleolus and some irregular chromatin granules [Figure 3(f)]. The tumor cells showed marked variation in size and shape of nuclei, atypical mitosis and collagen.



3(e) GCT associated with secondary aneurismal bone cyst (100X)



3(f) Malignant change associated with GCT, high grade fibrosarcoma(100X)

DISCUSSION

Giant cell tumour represents around 4-5% of all primary bone tumours, and approximately 20% of benign primary bone tumours.^[9] Giant cell tumour is usually seen in patients over 20 years of age.^[10] Although 10-15% of cases occur in children below 10 years.^[9]

In our study the incidence of GCT was 9 % of all primary bone tumours which is much higher than other studies.

Our study showed patients between 11 and 55 years of age with maximum incidence in 3rd (49/108)

and 4th (32/108) decades of life. There was male preponderance in our patients 57/108 with male to female ratio 1.12: 1. Findings with regard to clinical symptoms, anatomic location was similar to those reported in the literature.^[11]

The Macroscopic appearance of an intact specimen mirrors the radiological appearances in its eccentric location and fairly well defined area of bone destruction.¹

The giant cell tumour was diagnosed on the presence of numerous osteoclast type giant cell having 100 or more nuclei and stromal cells.

It is now generally accepted that the characteristic large osteoclastic giant cells are not neoplastic. The mononuclear cells, which represent the neoplastic component, are thought to arise from primitive mesenchymal stromal cells.

A striking feature, in one third of cases, is the presence of intravascular plugs, particularly at the periphery of the tumour ;this does not appear to be of prognostic significance. Areas of necrosis are common especially in large lesions. These may be accompanied by focal nuclear atypia which may suggest malignancy.^[9]

Microscopic evidence of malignancy was found in one of our cases of giant cell tumour of recurrent lesion. The malignant GCT consists of spindle shaped cells loosely arranged in vascular framework. The nuclei are elongated and vesicular, with a prominent nucleolus and some irregular chromatin granules. The tumour was showing marked variation in size and shape of nuclei, atypical mitosis and collagen.^[9, 12]

The histological differential diagnosis also included other giant cell lesions such as brown tumour seen in hyperparathyroidism, giant cell reparative granuloma, chondroblastoma and pigmented villonodular synovitis. The morphological identity between the nuclei of the stromal cells and those of the giant cells helps distinguish GCT from these other lesions.

All the patients were given treatment depending upon the patient's profile which included extensive curettage, resection and radiation.

GCT is capable of locally aggressive behaviour and occasionally of distant metastasis. Histology does not predict the extent of local aggression. Curettage and bone grafting in our series was done in 71 patients 15 of them recurred within three years. However, the

incidence of recurrence was low when curettage was thorough and combined with bone grafting.

En-bloc resection yielded the best result in our study. Treatment by radiation was given in one case where the tumor was situated in the axial skeleton. Radiation therapy has been criticized by almost every author due to the fact that the tumor had a high recurrence rate following radiation and that the risk of sarcomatous change is quite high. ^[13, 14]

Overall recurrence rate in the present series was 17% after curettage. Resection proved to be the best mode of treatment with overall 8% recurrence.

CONCLUSION

GCTs of bone have been described as the most challenging benign bone tumors.^[2] Although benign, GCTs show a tendency for significant bone destruction, local recurrence, and occasionally metastasis. In our study GCT incidence was 9 % of all primary bone tumours and showed slight more predilections for males. The most common symptom was pain which occurred in 88 of the 108 patients. It was most often mild and intermittent at the onset and later became persistent and of increasing severity. Most common site was knee joint. Metastasis to lung was seen only in 3% of cases. 1% of cases had transformation in to malignant sarcoma. Resection proved to be the best mode of treatment with overall 8% recurrence.

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Ethical Clearance : clear

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Determinants of Youth Friendly Services Influencing Client Satisfaction: A Study of Client's Perspectives in India

Sunil Mehra¹, Ruchi Sogarwal², Vandana Nair³, Mahasweta Satpati⁴, Ramanand Tiwari⁴,
Kaushlendra Dwivedi⁴

¹Executive Director, ²Senior Technical Advisor, ³Assistant Director, ⁴Regional Manager, MAMTA Health Institute for Mother and Child, New Delhi, India

ABSTRACT

Study analyzes key determinants of Youth Friendly Health Services that influence the client's satisfaction level. Data from 120 clients were collected from selected four districts of Uttar Pradesh and Bihar States of India. Multivariate logistic regression model was applied to understand the independent effect of important predictors. Overall only 32.0% clients were satisfied with the services. Positive association is observed with the educational status of the clients. If the parents/guardians are supportive, clients are 4.4 times more likely to get overall satisfaction from the services. 92% clients are less likely to get satisfied, if there is a fear of privacy disclosure to parents. Hence, privacy and confidentiality in services and support of parents/guardians play a significant role in affecting client satisfaction as compared to other determinants of the services. Study will enable decision-makers to improve the quality of health care effectively, keeping a balance between providers' and clients' perspectives.

Keywords: Youth, Reproductive Health, Satisfaction, Health Services

INTRODUCTION

There is a growing recognition that “adolescent-friendly” health services are needed if adolescents are to be adequately provided with preventative and curative health care. Under the Reproductive and Child Health Programme-II, Government of India has a mandate to provide affordable quality of “Adolescent Friendly Health Services (AFHS)” and hence ARSH clinics are established within the existing public health system^{1,2}. The strategy of AFHS influences the health care seeking behaviour of adolescents and in turn impacts the health indicators positively. The key ‘friendly’ characteristics of services for adolescents are at the levels of the clients, providers and health system, which in turn are the determinants of the quality of the services². In recent years developing countries have become increasingly interested in assessing the quality of their health care. In a number of countries around the

world, standards for quality have been developed for ascertaining the performance of health facility for adolescents. Standards are valuable in strengthening program implementation, monitoring and evaluation as they set clear performance goals against which performance can be monitored, assessed and/or compared.

Evidence indicates that satisfaction surveys have been widely used to address the issues of access and performance³⁻⁶. Indeed, they have been instrumental in helping government agencies to identify target groups, clarify objectives, define measures of performance, and develop performance information systems⁷⁻⁸. Supportively, client satisfaction is a dominant concern that is intertwined with strategic health services decisions⁸⁻¹¹. Client satisfaction evaluations may provide the only means for clients to express concerns about the services received, and to express their views about new services that are needed. The present study analyzes the key determinants of YFHS that influence the client's satisfaction level that would help decision makers to implement programmes tailored to clients' perceived needs.

Corresponding author:

Ruchi Sogarwal

Senior Technical Advisor

MAMTA Health Institute for Mother and Child,

B-5, Greater Kailash Enclave II, New Delhi

E-mail: ruchi.dr@gmail.com

MATERIALS AND METHOD

In the present article, data from baseline survey of intervention project on “Improving Reproductive and Sexual Health of Young People by Increasing the Age at Marriage in India” has been utilized. Since 2008, MAMTA-Health Institute for Mother and Child¹² is being implementing the project with the goal to improve adolescent sexual and reproductive health by increasing age at marriage and delayed first pregnancy among young people aged 10-24 years.

The baseline data was collected by trained researchers during April-July, 2012 from Hardoi and Siddharth Nagar districts in Uttar Pradesh and Nalanda and Vaishali districts in Bihar state. Again from each selected district, one Primary Health Center (PHC) was covered to collect data from the clients. A consecutive sample of 120 clients consisting equal number of males and females was interviewed from selected PHCs, however, the question on satisfaction level was reported by 114 clients only.

Statistical Analysis

Chi-square (χ^2) test was used to check the association between the variables. The service related variables which are found significantly associated with client satisfaction as a result of χ^2 were used in Multivariate logistic regression model to assess the likelihood of getting satisfied from the services using the

mathematical form as:

$$\log [p/(1-p)] = b_0 + b_1 \cdot x_1 + b_2 \cdot x_2 + \dots + b_k \cdot x_k + e_i$$

where b_1, b_2, b_3 etc. are the logistic regression coefficients and $\log [p/(1-p)]$ is called the log odds or logit of the event. Hosmer - Lemeshow test was applied to understand the goodness of fit of the model.

RESULTS

a. Socio-demographic characteristics of clients by “Satisfaction level”

In all, 32.0% clients reported that they were satisfied with the services received from the ARSH clinics. Female clients reported more satisfaction (36.4%) in contrast to male clients (25.4%). Positive association was observed with the educational status of the clients. Clients who were educated up to intermediate and above reported high level (37.2%) of satisfaction in comparison to the clients who were educated up to middle school (25.0%) and high school (27.0%). Differentials in satisfaction were seen by the religious background of the clients. 25.0% Muslim clients and 30.9% Hindu clients reported to be satisfied. Varying level of client satisfaction has been reported by caste, marital status and status of the studentship. Less percentage (28.1%) of student clients were reportedly satisfied in comparison to the clients who were not students (34.0%). No clear pattern was observed by income level of the household. (Table 1)

Table 1: Socio-demographic Characteristics of Clients by ‘Satisfaction level’

Characteristics	Satisfaction		Number*
	Yes	No	
Age of the Clients			
Less than 20 Years	31.1	68.9	61
20 Years and above	30.2	69.8	53
Sex of the Clients			
Male	25.4	74.6	59
Female	36.4	63.6	55
Educational Qualification			
Uneducated	33.3	66.7	6
Up to Middle School	25.0	75.0	28
High school	27.0	73.0	37
Intermediate and Above	37.2	62.8	43
Religion			
Hindu	30.9	69.1	110
Muslim	25.0	75.0	4
Caste/Tribe			
Scheduled Caste/Scheduled Tribe	35.0	65.0	40
Other Backward Class	23.1	76.9	52
Others	40.9	59.1	22

Table 1: Socio-demographic Characteristics of Clients by 'Satisfaction level' (Contd.)

Characteristics	Satisfaction		Number*
	Yes	No	
Marital Status			
Ever Married	27.8	72.2	36
Never Married	32.4	67.6	68
Student			
Yes	28.1	71.9	64
No	34.0	66.0	50
Monthly Income of Household (in Rs.)			
Less than Rs. 1500	22.2	77.8	18
Rs. 1501-3000	38.9	61.1	36
Rs. 3001-5000	26.9	73.1	26
More than Rs. 5000	34.8	65.2	23
Total	32.0	68.0	114

*Total number may not be 114 due to missing cases.

b. Characteristics of Youth Friendly Services influencing client satisfaction:

32.0%, 38.0% and 25.8% clients were satisfied who reported convenient day and hours of the facility; waiting area availability below average level of cleanliness status. The variation in client satisfaction is not significant by appropriateness of the time given

by doctor; clients' belief about confidentiality of information; provision of information demanded and support of parents. Less percentage (23.8%) of clients were satisfied if the time given by the doctor was not appropriate. Additionally, 32.0% clients were satisfied if they got the information wanted and about 36% clients were satisfied if parent's attitude was supportive. (Table-2)* χ^2 is significant, $p < 0.001$

Table 2: Characteristics of Youth Friendly Health Services Influencing Client Satisfaction

Characteristics	Client's Overall Satisfaction		
	Yes	No	Number
Day and Hours are Convenient			
No	21.4	78.6	14
Yes	32.0	68.0	100
Waiting Area Available*			
No	0.0	100.0	14
Yes	38.2	61.8	89
Cleanliness			
Below average	25.8	74.2	66
Average and above	37.5	62.5	48
Privacy Maintained			
No	30.6	69.4	72
Yes	31.0	69.0	42
Time Given by Doctor is Appropriate			
No	23.8	76.2	42
Yes	34.7	65.3	72
Suggestion Given by Doctor			
Not Satisfactory	26.1	73.9	46
Satisfactory	39.1	60.9	46
Information will be Kept Confidential*			
No	35.2	64.8	91
Yes	13.0	87.0	23
Got the Information You Wanted*			
No	0.0	100.0	8
Yes	32.4	67.6	105
Supportiveness of Parents*			
No	15.4	84.6	26
Yes	35.6	64.4	87

* χ^2 is significant, $p < 0.001$

Results from multivariate logistic regression analysis in which only significant Odds Ratio (OR) of three different regression models is shown in **Table-3**. Model I presented unadjusted OR for client satisfaction whereas Model II presents adjusted OR for three indicators i.e. 'Staff at YFHS informing the Parents/Guardians if an unmarried visits the Facility'; 'Provision of information and services demanded'; and 'Availability of waiting area'. In Model III OR was adjusted for all important socio-economic and demographic characteristics.

Model I shows that 'if Parents/Guardians are supportive for Reproductive Health Services', clients

are three times more likely to get satisfied. Even after controlling the effect of privacy, information and services demanded and availability of waiting area, the also the likelihood of getting satisfied is more among the clients whose parents and guardians were supportive (Model-II). In Model III after controlling the effect of socio-economic and demographic characteristics of the clients, 'support of parents/guardians' and 'privacy and confidentiality' are significantly associated with the client satisfaction. If the parents/guardians are supportive, clients are 4.4 times more likely to get satisfied from the services. Further, 92% clients are less likely to get satisfied, if fear exists of getting privacy disclosed to parents.

Table 3: Results from Logistic Regression Analysis-Likelihood of Client's Satisfaction

Characteristics	Odds Ratios		
	Model I	Model II	Model III
Parents/Guardians Supportive for Reproductive Health Services ^a	3.045**	2.843**	4.431**
Staff at YFHS may Inform to the Parents/Guardians ^b	0.277**	—	0.080*
Received the Information and Services that Wanted ^c	—	—	—
Waiting Area Available ^d	—	—	—
Caste/Tribe			
Other Backward Class [®]			
Scheduled Caste/Scheduled Tribe	—	—	4.666**
Others	—	—	7.075**

Note: Only significant Odds Ratios are Presented in the Table; * $p < 0.05$, ** $p < 0.10$; [®]Reference category;

Model I à Unadjusted; **Model II** à Adjusted for Characteristics b, c and d; and

Model III à Adjusted for Characteristics b, c, d, Age of the Clients, Sex of the Clients, Educational Qualification, Religion, Marital Status, Currently Student and Monthly Income of Household.

DISCUSSION

The provision of health care is expected to respond directly to the client's preferences and demands; and efficacy of the treatment are enhanced by greater client satisfaction¹³⁻¹⁴. The paper deals with satisfaction rate among the clients consulting the YFHS. Varying level of client satisfaction has been reported by appropriateness of the time given by doctor; clients' belief that information will be kept confidential; provision of information desired; and support of parents. More clients' differentials in satisfaction were observed including the availability of waiting area at health facility, convenient day and hour and clean surroundings. Although there is relatively little published evidence on what determines client satisfaction among adolescents, the findings from this study are quite unexpected given that most of the literature on 'adolescent-friendly' service programs emphasize that attitudes of health care providers

should be a first priority¹⁵⁻¹⁸. In our study sample, 'privacy and confidentiality' of the information is found to be one of the most important factors that are significantly associated with the client satisfaction even after adjusting other determinants of YFHS. Findings are similar to other studies that show that the fear about lack of confidentiality is a major reason for young people's reluctance to seek help¹⁹⁻²³ and hence health services might not be acceptable to young people, even if available and accessible.

The second most important determinant of the client satisfaction prominent in our study was the support of parents and guardians. Surveys show that most adolescents will seek routine medical care with their parents' knowledge²⁴. Making parental involvement drastically affects adolescent decision-making, and reduces the likelihood of timely treatment. A survey conducted by American Medical Association found that the doctors were more likely than the general public

to favor confidentiality for adolescent clients, even when it meant withholding information from parents²⁴⁻²⁶. However, the health care provider's duty of confidentiality becomes complicated when the interests of an adolescent's parents or guardian must be factored into the provider-client relationship. Study highlights the gap between the perspective of client satisfaction as an element representative of quality of care and high quality health care from a professional point of view.

This research has certain limitations. Our study is restricted to the perspectives of the clients on health services; nonetheless, it has recognized various elements in the YFHS that need to be addressed to reduce the number of unsatisfied clients. The study corroborates findings with other studies that the perception and judgment of quality are highly individualistic and dynamic; consequently client satisfaction reflects only part of the quality of the entire health care process. This aspect should not be overestimated nor should it replace the notion of quality care²⁷⁻²⁸.

Government of India is committed to provide 'adolescent friendly' health services and improve the 'quality of services' as a means of increasing the access and utilization of services by young people. According to WHO, the health services from the user's perspective must be accessible and acceptable. From the provider's and manager's perspective, services must be appropriate, comprehensive, effective and equitable. With this context, client satisfaction emerges as an important way to attract more young people. However, it is well evident that the clients and laypersons may understand quality in a different way from health care professionals²⁸. Our study reveals with evidence that convenient day and hour, time spent by doctor and other determinants of the YFHS play a lesser role in affecting client satisfaction as compared to assurance for privacy and confidentiality and supportive role of parents. The results of research will enable decision-makers to improve the quality of health care effectively, keeping a balance between providers' and clients' perspectives.

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Conflict of interest

The authors declare that they have no conflict of interest

Source of support

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Ethical clearance

Ethical approval was sought from the Institutional Review Board. Informed consent was obtained from all the participants prior to the interview.

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Awareness and High Risk Behaviour Related to HIV/AIDS among Garment Workers in Bangalore, India

Saraswathi S¹, Jagadish S², Divakar S V³, Kishore K³

¹Assistant Professor, Bangalore Medical College and Research Institute, Bangalore, ²Assistant Professor, ³Professor, Dr. B.R. Ambedkar Medical College, Bangalore

ABSTRACT

Objective: To evaluate awareness and attitude regarding HIV / AIDS and high risk behaviour related to HIV infection, among garment workers.

Method and Material: A cross sectional study was conducted among 16-25 year old unmarried garment workers. A total of 216 participants were enrolled on voluntary basis. An in-depth interview was conducted using semi structured questionnaire.

Results: The study revealed better knowledge with respect to modes of transmission and prevention among male participants compared to females. The in-depth interview revealed that 10.93% of the males and 3.29% of the females had sexual encounter. The mean age of sexual debut was 22 years for men and 19 for women. Practices like non usage of condoms and multiple sex partners were also found among study population.

Conclusions: The knowledge about causation and prevention is very poor, especially among women. The proper awareness and counseling will reduce the high risk behaviors and help these young people to have a healthy lifestyle.

Keywords: HIV/AIDS, Risk behaviour, Garment workers, Awareness, Unmarried youth

INTRODUCTION

HIV/AIDS has become a major public health problem in India. There are 2.5 million people living with HIV/AIDS in India making it the third country having the highest prevalence.^[1] HIV prevalence among young people aged 15-24 years in India is 0.1%.^[2] HIV/AIDS more than being a biomedical phenomenon, is also a social phenomenon – an epidemic rooted firmly, some fear intractably in human behaviour.^[3] Garment industry is one of the fastest growing industries attracting adolescents and young adults as it does not require any qualification. In Bangalore alone, which is the capital of a southern state of India, there are 500,000 workers, among whom majority are women and migrant laborers^[4]. Since many risk behaviors, associated with

the transmission of HIV, are adopted in young age, it is very important to target the prevention efforts in the young age group. One of the major obstacles in conducting any health education campaign in these industries is time, which is very precious for both the employer as well as the employees. Another problem being that, many workers shift from one factory to another in search of better facilities. Hence both governments as well as NGOs have failed to conduct HIV/AIDS awareness programmes in these industries. This has created a situation where in many adolescents and young adults working in these industries lack proper knowledge about causation and prevention of HIV/AIDS, and also risky behaviour associated with it. Hence this study was conducted with an objective to evaluate awareness and attitude regarding HIV/AIDS and high risk behaviour related to HIV infection, among garment workers.

Corresponding author:

Saraswathi S

Assistant Prof.

Department of Community Medicine

Bangalore Medical College and Research Institute

Fort, K.R. Road, Bangalore, Karnataka-560002

Phone: 9880046228, e-mail: ssdrsaras@gmail.com

SUBJECTS AND METHODOLOGY

This cross sectional study was conducted in Sultanpalya and Kadugondanahalli, the urban field practice areas of reputed medical college in Bangalore.

There are 10 small and medium scale garment factories in these areas. Managements of these factories were contacted and permission requested to conduct this study. The 6 out of 10 factories willing to take part in this study had 300-500 employees each. The study was carried out during the month of June 2009, among the 16-25 year old unmarried workers. In each factory there were 100-110 individuals belonging to this age group, who were addressed in groups in their respective work place and were detailed on the study. Inclusion into the study was strictly on voluntary basis. An average of 36 people from each factory participated, making a total of 216. These volunteers were interviewed separately on their socio-demographic profile like age, education, religion, migration and income status using semi structured questionnaire. An in-depth interview was conducted to evaluate their awareness and attitude towards HIV/AIDS and high risk behaviour. At the end of the interview, health education was given to individuals using IEC material.

RESULTS

A total of 216 individuals were enrolled in the study, of which 152 (70.4%) were females and 64 (29.6%) were males. The mean age of the female participants was 20.3 + 4 years and males were 23 + 2 years. Majority of the study population belonged to the Hindu religion. Among the females 132 (86.8%) were literate, of which 91 were school dropouts and among the males 60 (93.8%) were literate and had completed their secondary education. 82.9% of study population belonged to the lower socio economic status. Majority (134) of the study population were migrants with rural background. Of these, 70.15% participants were either staying with their relatives or as paying guests or staying alone. This gave them a sense of independence with almost less or no parental control. Among the remaining migrants, women were staying in strictly supervised hostels meant for garment workers alone.

For the purpose of analysis, the information regarding HIV/AIDS was categorized into- Knowledge about causation and prevention, Attitude towards the disease, and Risky behaviour and practices related to HIV/AIDS.

Among the study population, all men (100.0%) and 89.5% women had heard about HIV/AIDS. About 16.5% were totally unaware of the disease. On further enquiry, out of the 89.5%, only 69.7% females said that they know about this disease and the remaining said

that they have only heard of it. They believed it is wrong to know regarding the disease, as it is related to sex. Also, when it is shown on TV programmes and advertisements, they either change the channel themselves or are not allowed to watch, by the elders. Some people even said that they don't understand what the programme is all about. When asked about the source of information majority of men said it was TV, newspaper and friends, and females said it was TV alone. None of them have attended any HIV/AIDS awareness programmes.

KNOWLEDGE OF PARTICIPANTS

In our study, the men were more aware of modes of transmission compared to women (Table 1). This may be due to their exposure to media and discussions about HIV/AIDS openly with their peers.

Our study revealed that (Table 2), women had poor knowledge as well as more misconceptions regarding HIV transmission. In this study 59.9% of females and all males agreed that HIV/AIDS is a preventable disease.

When asked "whether there is a cure for this disease or not at present?", 47 (30.9%) females and 34 (53.1%) males said that there is no cure for HIV/AIDS, 32 (21.1%) females and 26 (40.6%) males thought that there is cure and the remaining did not know.

Compared to males, the knowledge regarding prevention was poor among females (Table 3).

To know the attitude of study population towards HIV/AIDS, first we enquired 'whether we should talk about HIV/AIDS with our family and friends?' For this, 97 (63.8%) females and all men agreed that we should discuss about HIV/AIDS openly and help in spreading the awareness among our friends and relatives. But the remaining women said that 'it is a sensitive issue', 'difficult to talk', 'feel shy about', 'not allowed to talk such things' and 'we ourselves are not aware of the disease'

Secondly, when we asked "what is your reaction if anybody known to you, either at work place or at home, has HIV/AIDS?", 69 (45.4%) females and 55 (85.9%) males replied that they will help them and will not discriminate against them at work place. But 33 (21.7%) of females and 6 (9.4%) males said that they will avoid them and will not talk to them.

When asked “why so?” They replied that “there may be chances of them getting the disease”; “Others may think that we are also bad people like them”. These are the replies from those who knew that HIV/AIDS

does not transmit by talking, shaking hands, sharing personal things etc. This shows the presence of social stigma and fear of this disease.

Table 1: Knowledge of modes of transmission

Parameter	Females (n=152)				Males (n=64)			
	Yes	(%)	No	(%)	Yes	(%)	No	(%)
Sharing needles & syringes	97	(63.8)	55	(36.2)	63	(98.40)	1	(01.6)
Sex with multiple partners	106	(69.7)	46	(30.3)	64	(100.0)	00	
Through Blood Transfusion	97	(63.8)	55	(36.2)	63	(98.40)	1	(01.6)
Mother to Child transmission	52	(34.2)	100	(65.8)	47	(73.40)	17	(26.6)

Table 2: Misconceptions regarding modes of transmission

Parameter	Females (n=152)			Males (n=64)		
	Yes	No	DK*	Yes	No	DK*
Sharing glasses, plates etc.,	28 (18.4)	60 (39.5)	64 (42.1)	5 (07.8)	55 (85.9)	4 (06.3)
Hugging, shaking hands, sitting etc	10 (06.6)	87 (57.2)	55 (36.2)	1 (01.6)	62 (96.9)	1 (01.6)
Mosquitoes bite	61 (40.1)	44 (28.9)	47 (30.9)	10 (15.6)	35 (54.7)	19 (29.7)

DK* = Don't know. Percentages are in parenthesis

Table 3: Knowledge of methods of prevention

Parameter	Females (n=152)		Males (n=64)	
	Yes	No	Yes	No
Using condom	48 (31.6)	104 (68.4)	61 (95.3)	3 (4.7)
Responsible Sexual behaviour	101 (66.4)	51 (33.6)	64 (100.0)	00
Using Disposable needles, syringes	97 (63.8)	55 (36.2)	63 (98.4)	1 (1.6)

High-risk Behavior Related to Hiv/Aids among Study Population

Among men: The questions were related to their habits like smoking, alcohol intake, chewing tobacco and injectable drug use. The personal questions included whether they have any girlfriends, any sexual experience, have seen condom and used condom etc.

Of the 64 men, 41(64.1%) were smokers and 27(42.2%) had used alcohol but none of them said they used injectable drug.

During the interview, many of the participants confided that many of their colleagues, both males and females have illicit relations for money and other favors. 39 of 64 males said that they have girlfriends and interestingly none of their girlfriends were working in the same factory. Of the remaining 25 men without girlfriends, 13 are against relationships and premarital sex and 10 of them said they are getting married shortly. A total of 7 men said that they have had sexual experience; of which 5 belonged to those 39 who had girl friends and 2 had sex with female sex worker (FSW). Reasons for the premarital sex is ‘for recreation’, ‘for

curiosity’, ‘friend’s influence’, ‘normal phenomenon between a couple once they are in love’,. The two men who visited FSW said that the reason for premarital sex was for getting some relaxation from work stress, boredom and to fulfill the normal physical need. About 19 (48.7%) males having girlfriends said that ‘it is just in the beginning phase of the relationship and they don’t know if their partners will allow it’; they just hold their girlfriend’s hand, give gifts, and take them to hotels and movies. They are worried about getting caught by their parents/relatives while with their girl friends. 6 boys who had little longer courtship had tried to kiss and hug their girl friends but were not successful, and were also threatened to be left by their girl friends. 9 men said they will not force their girlfriends for sex till marriage.

When asked about condom, all men said that they have seen it mainly in the gent’s toilets in the theatres and main bus terminals where condom vending machines are placed. Fortunately these men with girlfriends know that responsible sexual behaviour can prevent them from getting this deadly disease.

The mean age of sexual debut was 22 years. Out of this 7, five had single partners (their girlfriends whom they claimed to marry later) and 2 had visited FSW. These 2 men said they use condoms regularly, though not so when they first visited the FSWs. The 5 men also said that they have used condom, but not regularly, because 'they cannot keep condoms always with them for the fear of someone finding it, and sex is not always planned'. And when asked about pregnancy, they said 'the girl will take care of that, because she knows about the safe period', 'she takes some tablet' 'nothing has happened till now' and 'Only once we had sex'

When asked about the chances of getting infection from girlfriend, they replied that 'she is very good and faithful to me, and she is not that type of a girl'.

Interestingly 3 men said they have seen a person suffering from AIDS and later his death. From then on they are scared of this disease and they have no interest in premarital sexual experience.

Among women: Out of 152 females, 69 (45.4%) had boyfriends. 5 out of the 69 females admitted of having sexual experience. The mean age for sexual debut was 19 years. The reason for premarital sex was 'we love each other very much', 'we are going to marry anyways', 'if I don't agree he will become sad and I don't want him to be sad', 'he is very nice and many girls are after him and I don't want to lose him', 'it is one way of showing how much I love him'.

Out of this 69 females, 40.6%(28) said it was difficult to say no to sex, because of which they had arguments with their boyfriends, so they try not to go alone with them as much as possible. But some times they allowed their boyfriends to hold their hands. They were scared of becoming pregnant and also scared of other people noticing them. Some even said that they don't trust the boys. The remaining 60% said that their boyfriends never asked them to go out alone with them; they have never asked for sex or to touch their hands. The girls believed that they are well behaved and good boys. Even if the boys asked, the girls said that they would not obey them or talk to them and would leave them if they ever try forcing them.

Out of the 69 females having boyfriends, 21(30%) did not know that HIV spreads through sexual contact. Out of the 152 females, though 92 had heard of condom, only 6 had seen it. Out of the 69 girls having boyfriends, only 25(36%) knew that condom use can prevent the spread of HIV/AIDS. One of the 5 girls who had sexual experience said that her boyfriend uses condom. When

asked about the risk of pregnancy to these 5 girls, they said that 'we do not have sex frequently', 'once my boyfriend gave some tablets when my menstrual cycles delayed, from then on we stopped having a physical relationship', 'I know about safe period (she had read in one of the magazine her boyfriend had brought)', 'we use condom', and 'history of abortion at 3rd month, not seen that boy since then'.

DISCUSSION

According to National Family Health Survey III (NFHS III, 2005-06) among 15-24 year old age group, 19.9% women and 36.1% men had comprehensive knowledge about HIV/AIDS.

This study revealed a better knowledge among male participants regarding HIV/AIDS, the modes of transmission and prevention which might be as a result of open peer discussions.

Only 10.93% of the males and 3.29% of the females among the total participants, who were in a relationship, had revealed about their sexual encounter. The mean age of sexual debut was 22 years for men and 19 for women.

According to NFHS III^[5], among never married youth, 12 percent of men and 1 percent of women reported having sexual intercourse. Although relatively low, these statistics point to the fact that higher-risk sex and sex with multiple partners is not uncommon among youth in India. Further, the majority of youth who are having higher-risk sex are not using condoms which protect against both disease and unwanted pregnancy.

A similar study by Sayem and Popsi^[6] among female garment workers showed that their knowledge of HIV/AIDS was moderate with high rates of misperception regarding modes of transmission. Further, risky behaviour such as low use of condoms, multiple sex partners and drug abuse were also found.

Health education: Was given individually using IEC material, because managements of these factories had refused for mass health education due to time constraints.

CONCLUSION

The knowledge about causation and prevention is very poor, especially among women. They also had some misconceptions which resulted in negative attitude towards the HIV/AIDS patients. Though some of the participants came out with their sexual experience

boldly, there might have been many such people who did not wish to discuss these things. But given the proper awareness and counselling, we can reduce the high risk behaviours and help them have a healthy lifestyle. There should be a continuous awareness programme, which is possible only when the authorities of these factories take responsibility and participate voluntarily. The in-charge medical officers in such factories should take up the responsibility of educating the workers regarding the modes of transmission and preventive measures on HIV/AIDS.

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Breast Hamartoma - An Underdiagnosed Entity

Savitri Singh¹, Parul Singhal²

¹Associate Professor, Deptt. of Pathology, Saraswathi Medical College, Hapur, ²Associate Professor, Deptt of Pathology, Santosh Medical College, Ghaziabad

ABSTRACT

Hamartomas or fibroadenolipomas are benign breast lesions often misdiagnosed as Fibroadenomas on clinical examination and after fine needle aspiration cytology. The relevant investigation in these cases has come out to be radiological assessment, especially mammography. The following case shows how the histopathological and clinical correlation achieved the diagnosis of hamartoma and prevented its misdiagnosis as Fibroadenoma.

Keywords: Hamartoma, Mammography, Fibroadenoma

INTRODUCTION

Mammary hamartomas are benign, painless, well-circumscribed, mobile breast lesions composed of varying amounts of fat, glandular and fibrous tissue. Since they are asymptomatic and have no distinct pathological feature, a correlation with the clinical findings and imaging techniques, mainly mammography is necessary to reach to the correct diagnosis.

CASE REPORT

A 45 year old female presented with a well defined lump in the right breast (upper, outer quadrant), measuring 5 x 3 cm; firm, mobile, nontender noticed one month back. No history of trauma, skin changes or nipple discharge.

Provisional diagnosis of fibroadenoma was made.

Fine Needle Aspiration Cytology (FNAC) reported it to be benign breast disease ? cyst.

On Ultrasound, the report was a well defined lump ? Fibroadenoma.

Mammography was not done, considering it to be fibroadenoma.

Lumpectomy was done to reveal a capsulated mass measuring

4 x 3 x 2 cm with a smooth, glistening surface. On cutting, it had a variegated appearance with presence of yellow areas at most places.

On Histopathological examination, fibrocollagenous capsule was seen enclosing large fat lobules separated by collagenous septa. Irregularly distributed breast

lobules were seen, showing focal epitheliosis, apocrine changes, cystic changes and metaplasia. (Fig. 1 and 2).

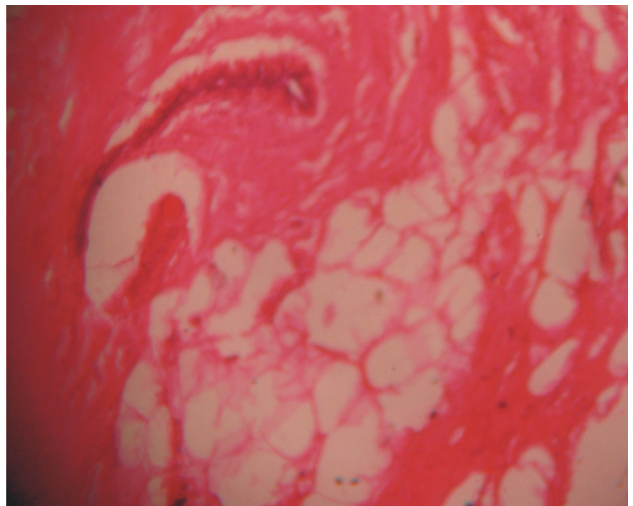


Fig. 1

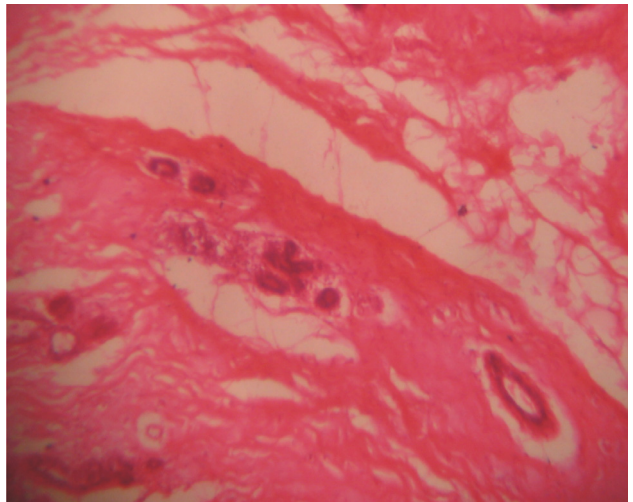


Fig. 2

A foci of pseudoangiomatous hyperplasia was also noted.

Some areas showed hyalinization and lymphoid aggregates.

Keeping in view the above findings, the final diagnosis of breast hamartoma was achieved.

DISCUSSION

Breast hamartoma also called fibroadenolipoma is a benign tumour with the mean age of 48 years. Hamartomas accounted for 1.2% of benign lesions and 4.8% of benign breast tumors.² It is important to recognise and diagnose this lesion because of coincidental epithelial malignancy and potential for recurrence. The management of hamartoma is complete surgical excision.

Mammary hamartoma has a reported incidence of 0.1% to 0.7%^{3,4,5} The true incidence is probably higher due to its underdiagnosis and misdiagnosis as fibroadenoma.

It contains sonolucent fat and echogenic fibrous components with a heterogeneous internal echo pattern.⁶ The MRI shows the presence of internal fat density in addition to the smooth well defined hypointense rim and internal heterogeneous enhancement, which are characteristic of breast hamartoma.

Diagnosis on mammography is considered to be conclusive. The lesion is completely separate from the breast having a circular configuration resembling a capsule with a radiolucent zone separating it from the normal breast tissue which it compresses.¹

Three category classification of the "fibrous", "fatty", and "fibro fatty" hamartoma has been put forward by McGuire and Cohn,⁷ and Jones *et al* suggested a four category classification of "encapsulated fibrocystic changes", "fibroadenoma with fibrous stroma", "fibroadenoma-like", and "circumscribed adenolipoma".⁸ Neither of these descriptive classification systems has been widely adopted. The current criteria used by practising pathologists have not been described in a detailed manner. The difference in lobular distribution and the presence of fat in hamartomas as the differentiating features against the more common fibroadenomas.

Adipose tissue within the stroma is commonly reported in hamartomas. Adipose tissue is present in

more than 90% of the cases, although the volume of adipose tissue generally accounts for 10–20% of the lesion volume.

Although hamartomas are benign, coincidental malignancy and potential recurrences may occur, emphasizing on the need of proper diagnosis and treatment.

Diagnosing hamartoma of the breast is difficult, especially in biopsy or FNAC. The pathologist who sees fibrous tissue within the lobules, or fibrous tissue and fat in the stroma with or without pseudoangiomatous changes, should be alerted to the possibility of a hamartoma.¹

CONCLUSION

With the awareness of this entity and good correlation of imaging findings, the clinical diagnosis of hamartoma of the breast should not be difficult. If careful attention is paid to the clinical information, histological underdiagnosis of hamartoma of the breast can be avoided.

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Clinico-Hematological Profile of Pancytopenia in North Karnataka-One Year Study

Seema Bijjaragi¹, Vardendra G Kulkarni¹, Satish L Belagatti¹, Sunil S Kadam²

¹Assistant Professor, Department of Pathology, ²Assistant Professor, Department of Forensic Medicine, J J M Medical College, Davangere, Karnataka

ABSTRACT

Pancytopenia is a common hematological problem in India. This study was carried out to identify the causes of pancytopenia. It was a prospective study conducted at the department of Pathology, KIMS, Hubli, India for a duration of one year. A total of 137 cases, which met the criteria for pancytopenia were included in the study. Complete hemogram, bone marrow examination and other investigations were done in these cases. Megaloblastic anemia, aplastic anemia and malaria are the major causes of pancytopenia in our study. As majority of causes for pancytopenia are treatable, a proper work-up to detect the underlying etiology should be attempted in all cases of pancytopenia.

Keywords: Pancytopenia, Megaloblastic Anemia, Aplastic Anemia

INTRODUCTION

Peripheral pancytopenia may be a manifestation of wide variety of disorders primarily or secondarily affecting the bone marrow.¹ Pancytopenia is the simultaneous presence of anemia, leucopenia and thrombocytopenia. Therefore it is diagnosed when hemoglobin is less than 13.5 g/dl in males, or 11.5g/dl in females; the leucocyte count is less than $4 \times 10^9/L$, and the platelet count is less than $150 \times 10^9/L$.² Pancytopenia has multiple causes, but the frequency of these causes has been reported in a limited number of studies. The etiology of pancytopenia varies in different populations depending on the differences in age patterns, nutritional status, climate and the prevalence of infections.³ Patients usually present with complaints ascribed to anemia, thrombocytopenia, and rarely leucopenia which in later stages is responsible for the downhill course.¹ The aim of the present study was to identify the clinical profile, etiological spectrum and bone marrow morphology of pancytopenic patients.

MATERIAL AND METHOD

The present study was carried out at the department of Pathology, Karnataka institute of Medical Sciences,

Hubli for a duration of one year from November 2005 to October 2006. A total of 1400 hospitalized patients, above the age of twelve years were found to be anemic on complete hemogram during this period and of these 137 cases met the criteria for the diagnosis of pancytopenia and were included in the present study. A detailed clinical history was taken and thorough physical examination was carried out in these patients. Bone marrow aspiration was performed in all the cases using Salah bone marrow aspiration needle at the posterior superior iliac spine. Bone marrow biopsy was done wherever required using a Jamshidi biopsy needle. Further investigations were carried out in the patients to arrive at the etiology of pancytopenia. The data was statistically analyzed using percentage test.

OBSERVATIONS

Total number of cases with pancytopenia in our study was 137 of which 73 cases were males and 64 cases were females and male to female ratio was 1.1: 1. The age distribution ranged from 14 to 84 years with mean age of 34.5 years.

Table 1: Age distribution in pancytopenia cases in the present study.

Age in years	No. of cases	Percentage
14-23	44	32.1
24-33	30	21.9
34-43	23	16.8
> 43	40	29.2
Total	137	100

Corresponding author:

Seema Bijjaragi

Assistant Professor

Department of Pathology

JJM Medical College, Davangere-577004, Karnataka

Mob: 9880610005

E-mail: drseema79@yahoo.co.in

In the present study majority of pancytopenia cases 44(32.1%) were seen in age group 14 to 23 years, followed by 40 (29.2%) cases above 43 years, 30(21.9%) cases in the age group 24 to 33 years and 23(16.8%) cases in the age group 34 to 43 years.

Table 2: Causes of pancytopenia in the present study.

Sl. no.	Cause of Pancytopenia	No. of cases	Percentage
1	Megaloblastic Anemia	78	56.9
2	Aplastic anemia	13	9.4
3	Malaria	12	8.7
4	Disseminated TB	7	5.1
5	Viral Hepatitis	7	5.1
6	Cirrhosis	5	3.6
7	Non Hodgkin Lymphoma	4	2.9
8	HIV	3	2.1
9	Subleukemic Leukemia	2	1.4
10	Multiple Myeloma	2	1.4
11	Myelofibrosis	1	0.7
12	Storage Disorder	1	0.7
13	Secondaries	1	0.7
14	MDS	1	0.7
	Total	137	100

In the present study the commonest cause of pancytopenia was Megaloblastic anemia seen in 78(56.9%) cases, followed by Aplastic anemia in 13(9.4%) cases, Malaria in 12(8.7%) cases, Disseminated Tuberculosis in 7(5.1%), Viral Hepatitis in 7(5.1%) cases, Cirrhosis in 5(3.6%) cases, Non Hodgkin lymphoma in 4(2.9%) cases, HIV in 3(2.1%), Subleukemic leukemia in 2(1.4%) cases, Multiple myeloma in 2(1.4%) cases, Myelofibrosis in 1(0.7%) case, Storage disorder in 1(0.7%) case, Secondaries in 1(0.7%) case and MDS in 1(0.7%) case.

Table 3: Hematological parameters in the present study.

Hemoglobin (gm/dl)	<5	5-7	7.1-10	>10
	76(55.5%)	33(24.1%)	23(16.8%)	5(3.6%)
MCV(fl)	<80	80-100	>100	
	29(21.2%)	54(39.4%)	54(39.4%)	
RDW(%)	11.5-14	14.1-24	>24	
	5(3.6%)	74(54%)	58(42.4%)	

In the present study, hemoglobin ranged from 1.9 to 10.9 gm/dl and mean hemoglobin was 5.1gm/dl. Majority of cases 76(55.5%) had hemoglobin less than 5gm/dl followed by 33(24.1%) cases between 5 to 7 gm/dl, 23(16.8%) cases 7.1 to 10 gm/dl and 5(3.6%) cases had more than 10gm/dl. Mean corpuscular volume (MCV) ranged from 58.4 to 141.9 fl and mean was 95.7 fl. Least number of cases had mean corpuscular volume less than 80 fl. In the present study Red cell distribution width ranged from 12.2 to 43.6 % and mean was 24 %. Majority of cases 74(54%) had 14.1 to 24%, 58 (42.4%) cases had more than 24% and 5(3.6%) cases had between 11.5 to 14%.

DISCUSSION

Pancytopenia is not an uncommon hematological problem encountered in our clinical practice and should be suspected on clinical grounds when a patient presents with unexplained anemia, prolonged fever and tendency to bleed.⁴

It is not a disease entity but a triad of findings that may result from a number of disease processes—primarily or secondarily involving the bone marrow. The severity of pancytopenia and the underlying pathology determine the management and prognosis of the patients.⁵ In India, the causes of pancytopenia are not well defined, so the present study would help in planning the therapeutic approach to the patients by providing an insight into the common etiologies of pancytopenia.

The causes of pancytopenia vary in different studies. The first two common causes of pancytopenia in different studies are compared in table 4. In the studies done by Tilak et al¹, Khunger et al² and Khodke et al⁶, megaloblastic anemia was the commonest cause of pancytopenia, followed by aplastic anemia, which is comparable to the results obtained in the present study.

Table 4: Comparison of the first and second most common causes of pancytopenia in different studies.

Study	Country	Year cases	No. of cause	Commonest common cause	Second most
International agranulocytosis and Aplastic anemia study group ⁷	Israel & Europe	1987	319	Hypoplastic anemia (52.7%)	MDS (4.5%)
Keisu and ost ⁸	Israel & Europe	1990	100	Neoplastic disease, r adiation (32%)	Hypoplastic anemia (19%)
Hossain et al ⁹	Bangladesh	1992	50	Hypoplastic anemia	Chronic malaria & chronic kala-azar

Table 4: Comparison of the first and second most common causes of pancytopenia in different studies. (Cont.)

Study	Country	Year cases	No. of cause	Commonest common cause	Second most
Varma and Dash ¹⁰	India	1992	202	Aplastic anemia (40.6%)	Megaloblasticanemia (23.26%)
Tilak et al ¹	India	1999	77	Megaloblastic anemia (68%)	Aplastic anemia (7.7%)
Kumar et al ¹¹	India	1999	166	Hypoplasticanemia (29.51%)	Megaloblasticanemia (22.3%)
Khodke et al ⁶	India	2000	50	Megaloblasticanemia (44%)	Aplastic anemia (14%)
Khunger et al ²	India	2002	200	Megaloblasticanemia (72%)	Aplastic anemia (14%)
Jha et al ¹²	Nepal	2007	148	Hypoplastic anemia (29.05%)	Megaloblasticanemia (23.64%)
Present study	India	2006	137	Megaloblasticanemia (56.9%)	Aplastic anemia (9.4%)

The incidence of megaloblastic anemia varies from 0.8-32.26% of all pancytopenia patients.² In the present study, megaloblastic anemia constituted 56.9% of cases and was the commonest cause of pancytopenia. This is in sharp contrast to the results of various studies from developed countries where aplastic anemia is the commonest cause of pancytopenia. This seems to reflect the higher prevalence of nutritional anemias in Indian subjects. Megaloblastic anemia causes substantial morbidity in patients with anemia and must be considered in the differential diagnosis of patients presenting with pancytopenia. Khanduri et al¹³ reported an incidence of pancytopenia in 62% cases of megaloblastic anemia.

Aplastic anemia is an acquired disorder in which bone marrow fails to produce and release sufficient blood cells, but in most cases the etiology is unknown.¹⁴ The incidence of aplastic anemia varies from 10-52.75% in pancytopenic patients.² In our series aplastic anemia accounted for 13 (9.4%) cases and was the second leading cause of pancytopenia. A secondary cause for bone marrow aplasia was elicited in three cases, which included drug history (chlorpromazine) and seropositivity for dengue fever.

Malaria may cause pancytopenia as a result of direct bone marrow invasion by the parasite, immune hemolysis, DIC, hypersplenism, bone marrow necrosis or hemophagocytosis.¹⁵

Ashraf et al suggested that hypersplenism is quite frequent in patients of chronic liver disease and most of the cases of pancytopenia in chronic liver disease patients are because of hypersplenism.¹⁶ Viral hepatitis was associated in seven cases of pancytopenia in our study. Hypoplasia of the bone marrow and hemophagocytosis are the underlying pathogenetic mechanisms for development of pancytopenia in viral hepatitis.

We reported seven cases of Tuberculosis with pancytopenia in our study. Basu et al¹⁷, Yadav et al¹⁸ and Singh et al¹⁹ have also reported varying incidence of pancytopenia in disseminated tuberculosis. The above studies prove the prevalence of TB in India, and it is necessary to be aware of its manifestation as pancytopenia. TB should be considered in the differential diagnosis of pancytopenia if fever or hepatosplenomegaly are associated.¹¹

We encountered three cases of HIV presenting with pancytopenia in our study. Bone marrow examination in these cases showed presence of epithelioid cell granulomas in one of the cases, whereas the other two cases showed erythroid hyperplasia with megaloblastoid change. Dikshit et al²⁰ found granulomas and hemophagocytosis as the commonest causes for pancytopenia in HIV patients.

Non Hodgkin lymphoma was detected in four cases of pancytopenia in our series. Bone marrow examination in these cases showed abnormal lymphoid cells diagnostic of NHL. Studies by Ma et al²¹ and Khunger et al² also noted pancytopenia in lymphoma cases. The other hematological malignancies presenting with pancytopenia were multiple myeloma, subleukemic leukemia and MDS, the frequencies of which were similar to the results obtained in other studies.

CONCLUSION

The physical examination, peripheral blood picture and bone marrow examination play an important role in planning therapeutic approach to pancytopenic patients. Megaloblastic anemia, aplastic anemia and malaria are the major causes of pancytopenia in our study. As majority of causes of pancytopenia are treatable, a proper work-up to detect the underlying etiology should be attempted in all cases of pancytopenia.

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Co-Relation between Chronic Periodontitis and Anemia - A Pilot Study

Kshitiz Parashar¹, Tarun Khera¹, Rani Somani¹, Pradeep Shukla²

¹PG Student, Department of Paedodontics and Preventive Dentistry, ²Prof. & HOD Department of Periodontics and Implantology, D J College of Dental Sciences and Research, Modinagar, Uttar Pradesh, India

ABSTRACT

Aim: Anemia of chronic disease, a cytokine-mediated anemia, is a frequent complication of many chronic inflammatory conditions. The present case control study was aimed to evaluate levels of systemic hematological markers indicative of anemia in patients with generalized, severe, chronic periodontitis.

Methods: A convenience quota sample of 110 systemically-healthy, urban, male patients of a town Modinagar district Ghaziabad (42 Kms from New Delhi), comprised two groups, based on full mouth periodontal examination: group A patients (n = 50) were diagnosed with generalized, severe, chronic periodontitis, and group B patients comprised the control group (n = 50), which included patients with a clinically-healthy periodontium. Out of these 10 patients were eliminated due to diagnosis of systemic diseases. Laboratory blood investigations included hemoglobin (g%), total number of erythrocytes (red blood cells), hematocrit/packed cell volume, erythrocyte sedimentation rate, mean corpuscular volume of erythrocytes, and mean corpuscular hemoglobin concentration. An analysis was done to compare the mean values of hematological parameters within groups.

The mean values of hemoglobin, red blood cells, packed cell volume, and mean corpuscular hemoglobin concentration were significantly lower, while the mean corpuscular volume of erythrocytes and erythrocyte sedimentation rate were significantly higher in group A patients compared to those in group B, indicating mild anemia.

Conclusions: Severe periodontal disease can be linked with anemic status.

Keywords: Anemia of Chronic disease, Periodontitis, Anemia

INTRODUCTION

The initiation and progression of gingivitis and periodontitis may be affected by certain systemic conditions. The converse side of the relationship between systemic health and oral health has also been demonstrated. This means that there may be potential effects of periodontal disease on a wide range of organ systems.¹ Anemia of chronic disease is defined as anemia occurring in chronic infections, inflammatory conditions or neoplastic disorders that are not due to marrow deficiencies or other diseases, and occurring despite presence of adequate iron stores and vitamins.² Recently, Hutter² has concluded that periodontitis, like other chronic conditions, lead to anemia.

Periodontitis, a chronic, infectious disease associated with gram-negative microorganisms that exist in a subgingival biofilm,³ is one of the most widespread diseases worldwide.⁴ The prevalence of

periodontitis is reported as affecting 30–50% of the population, with approximately 10% having a severe form, and it is more prevalent in developing countries.^{5–7}

Chronic periodontitis is the most common form of periodontal disease, which progresses relatively slowly and is more common in adults.

Anemia is defined as a state of reduced Hb concentration, reduced number of circulating erythrocytes in the blood, or both. Anemia is a common and serious health disorder among both sexes and all age groups, although it has a higher prevalence among women than men in India.⁸ Anemia of chronic disease (ACD) is a form of anemia that occurs in chronic infections and inflammatory conditions; it occurs in the presence of adequate iron stores and vitamins, and is not due to marrow deficiency.

Anemia of chronic disease (ACD) has been described in the literature, and seems to be one of the most common

forms of anemia observed in clinical medicine¹⁰⁻¹². ACD is defined as the anemia occurring in chronic infections, chronic inflammatory processes or tumor formation that is not due to dysfunction of bone marrow cells or other diseases, and occurring despite the presence of adequate iron stores and vitamins¹⁰⁻¹². A characteristic finding of the disorders associated with ACD was the increased production of the cytokines that mediate the immune or inflammatory response; such as tumor necrosis factor, interleukin-1, and the interferon. All the processes involved in the development of ACD can be attributed to these cytokines, including shortened red cell survival, blunted erythropoietin response to anemia, impaired erythroid colony formation in response to erythropoietin, and abnormal mobilization of reticuloendothelial iron stores¹³. These cytokines are also released by periodontal tissues in response to bacterial infection, which suggests that periodontitis like other chronic disease may cause ACD.

However, conflicting results have been reported regarding the association of periodontal disease and anaemia.¹⁴⁻¹⁷ The purpose of this pilot study was to compare the hematological parameters related to anemia in male patients with severe periodontal disease with that of periodontally healthy male patients, and thereby evaluate a possible association between severe periodontal disease and anemia.

MATERIALS AND METHOD

A convenience quota sample of 110 adult, male patients in the age range of 30–60 years, who reported to the, Department of Periodontics and Oral Implantology in D.J.College of Dental Science & Research, India, were enrolled in the study. Out of these 10 patients were excluded due to detection of systemic diseases. The study protocol was approved by the institutional ethical committee. Informed consent was obtained from patients. Demographic and clinical data were collected by means of a questionnaire, survey of any previous medical records, and oral examination.

Inclusion criteria included presence of at least 20 teeth, body mass index of 18.5–25, and self-reported consumption frequency of at least four times per week of food from the following groups: milk or curd; pulses; fruits; dark green, leafy vegetables; eggs; chicken or meat; and fish. Exclusion criteria were a self-reported intake of vitamins and iron supplementation or any anti-inflammatory or antimicrobial drug within the previous 3 months; a self-reported history of acute or chronic medical conditions, including diabetes or viral, fungal,

or bacterial infections; smokers or smokeless tobacco or betel (areca) nut and betel quid (paan) consumers; alcohol consumers; past periodontal treatment; or a recent history of trauma or tooth extractions. A full mouth periodontal examination was conducted (Figure1).



Figure 1: CPITN probe used for measuring the pocket depth and clinical attachment level at baseline

Clinical periodontal parameters were recorded with a Williams graduated probe at six sites on each tooth for both case and control groups. These were probing depth (PD), clinical attachment loss (CAL), and bleeding on probing (BOP), as recorded on visual examination after 30–60 sec of probing. Based on the clinical examination, selected patients were grouped into case and control groups.

Fifty patients with at least 30% of sites with a CAL of 5 mm or more, along with 10% or greater number of sites with a PD of 6 mm or more were diagnosed with generalized, severe, chronic periodontitis. These patients made up group A. Fifty patients with 0% of sites with CAL were considered periodontally healthy and made up the control group, group B.

BLOOD COLLECTION AND ANALYSIS

10 mL venous blood samples were collected by venepuncture under aseptic conditions in the antecubital fossa without excessive venous stasis between 9.00 and 12.00 hours for both case and control group patients. The blood was transferred into ethylenediaminetetraacetic acid containing bulbs. Centrifugation of blood using REMI R-8C laboratory centrifuge for measuring serum ferritin was assessed. (Figure 2)



Figure 2: Centrifugation of blood using REMI R-8C laboratory centrifuge for measuring serum ferritin



Figure 3: Symex cell counter used for measuring Hb, RBC and PCV



Figure 4: Wintrobe's tube method for detecting the mean corpuscular volume (MCV) (in cu mu), and mean corpuscular hemoglobin concentration (MCHC) of erythrocytes.

The hematological parameters assessed in the present study were hemoglobin (Hb) (in g% by Sahli's method),(Figure 2) total number of erythrocytes (red blood cells [RBC]) (in million/mm³ by a Neubauer counting chamber), hematocrit/packed cell volume (PCV) (in mm by Wintrobe's tube centrifuge method) (Figure 3), erythrocyte sedimentation rate (ESR) (in mm by Wintrobe's tube centrifuge method) mean corpuscular volume of erythrocytes (MCV) (in cu mu), and mean corpuscular hemoglobin concentration (MCHC) (in %)(Figure 4),. Student's t-test and an analysis of covariance for age adjustment were performed with appropriate Microsoft Excel software for a comparative analysis of outcome parameters between groups A and B.

RESULTS

The mean age of group A, which was 53.46 (± 7.4) years, was significantly higher than that of control group B, which was 42.13 (± 5.9) years. Thus, the analysis of covariance for age adjustment was applied to compare outcome parameters. The mean values of Hb and RBC were significantly lower in group A (11.19 ± 1.97 g/dL and 4.81 $\pm .392$ million/mm³) compared to group B (16 ± 1.8 g/dL and 6.09 $\pm .30$ million/ mm³) ($P < 0.001$). Similarly, the mean values for the PCV and MCHC were significantly lower in group A being 38.71 ± 4.22 % and 32.88 ± 2.1 %, respectively) compared to those recorded for group B 44.9 ± 3.7 % and 37.11 ± 1.2 %, respectively ($P < 0.001$). The mean MCV in group A 97.51 ± 7.29 cu mu) was significantly higher than that of group B 88.5 ± 3.03 cu mu). The mean value of ESR was also noted to be higher in group A (19.71 ± 9.82 mm) compared to group B [3.72 $\pm .921$ mm), which was statistically significant ($P < 0.001$) (Table 2). Even after adjusting for the age difference between both groups by the analysis of covariance, the differences between both groups remained statistically significant.

Table I: Mean & SD and student 't' test significance values for systemic Parameters within groups. (n=50)

PARAMETERS	GRP. (A) mean (\pm SD) (n= 50)	GRP. (B) mean (\pm SD) (n=50)	P-VALUE
Hemoglobin	11.19 ± 1.97	16 ± 1.8	.0007* ($P < .001$)
RBC	4.81 $\pm .392$	6.09 $\pm .30$.00002* ($P < .001$)
Packed cell volume	38.71 ± 4.22	44.9 ± 3.7	.00038* ($P < .001$)
Erythrocyte sedimentation rate	19.71 ± 9.82	3.72 $\pm .921$.00000* ($P < .001$)
Mean corpus volume	97.51 ± 7.29	88.5 ± 3.03	.00001* ($P < .001$)
Mean corpus hemoglobin concentration or (P<.05)	32.88 ± 2.1	37.11 ± 1.2	.0005* ($P < .001$)

* $P < .001$ shows a high significant different between group A & B

DISCUSSION

Anemia of chronic disease is the second most prevalent form of anemia after nutritional, iron-deficiency anemia, and can coexist together, causing additional anemic burden. ACD is a cytokine-mediated anemia characterized by hypoferrremia, with adequate reticuloendothelial iron stores and normal-to-elevated ferritin concentrations. It is a known, frequent complication of chronic inflammatory conditions^{18,19} such as rheumatoid arthritis. The pathogenesis is reported to be dysregulation of iron homeostasis, depressed erythropoiesis, and a blunted erythropoietin response caused by elevated levels of systemically-circulating pro-inflammatory cytokines resulting due to a local chronic inflammatory process.²⁰

Various studies have tried to evaluate the relationship between periodontitis and hemoglobin. Hutter et al.² and Thomas et al.²¹ found that periodontitis patients have lower hematocrit, lower numbers of erythrocytes, lower hemoglobin levels and higher erythrocyte sedimentation rates when compared to healthy controls. Rai and Kharb²² found an increased in hemoglobin and RBC levels in patients with severe periodontitis after scaling and root planning. Considering the relatively high prevalence of anemia, as well as periodontal disease, in Indians, determining the etiological contribution of periodontitis to the presence of an anemic status assumes clinical significance. Smoking tobacco alters systemic cytokine levels and contributes to anemia,²³ as well as increased periodontal destruction.²⁴

In our study, MCV levels in both groups were within the reference values,²⁵ indicating normocytic anemia in group A, as commonly seen in ACD. As MCV levels greater than 95 have been reported as less likely to indicate iron deficiency anemia, and are suggestive of ACD with high predictability^{26,27} we can attribute the anemia in group A as ACD. The normal range of MCHC is 28–33 g%, and the means for both groups fell within this range, although group A showed a significantly lower mean MCHC, indicating mildly hypochromic anemia. While hypochromia is commonly suggestive of iron deficiency anemia, a mildly hypochromic ACD has been reported in 30–40% of cases.⁹

Although the RBC indices noted in our study are suggestive of ACD, an analysis of serum ferritin levels and the soluble serum transferrin receptor concentration, or a bone marrow examination, would be necessary²⁸ to quantify iron stores and definitively

distinguish between ACD and iron-deficiency anemia in patients with periodontal disease. Within the limits of the study, our results indicate a possible effect of severe periodontal inflammation on the severity of anemia, and we suggest that periodontal therapy might have a potential role in improving anemic status in periodontally-diseased individuals.

Long term, multicenter, prospective studies are essential to verify the magnitude and clinical relevance of this potential therapeutic effect.

CONCLUSION

Generalized, severe, chronic periodontal disease is positively associated with decreased levels of Hb, hematocrit, and RBC counts, along with increased ESR and MCV levels, suggesting that mild ACD is induced by the systemic effects of periodontal inflammation in patients with severe periodontal disease.

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Non-invasive Facelift for Dentate Patients: A Prosthetic Device and Technique

Shruthi C¹, Poojya R²

¹Reader, Department of Prosthodontics, ²Senior Lecturer, Department of Prosthodontics, M R Ambedkar Dental College and Hospital, Bangalore.

ABSTRACT

Angellift is one of those unique devices and techniques, available for any adult to look younger and better. Angellift is a noninvasive, pain free, invisible and reversible facelift. Angellift can add volume, retrain facial muscles and remove the appearance of wrinkles below the nose and above the chin. This patented techno prosthetic device, which is a combination of silicone and nylon resin, is custom-fitted and removable.

Keywords: Face lift, Angellift

INTRODUCTION

We repair teeth, we whiten teeth, we create teeth, we sculpt them and augment them, but much of our beautiful work is hidden behind our patient's wrinkles, which we have been unable to address effectively. Angellift offers a solution to this problem.

In removable prosthodontics, we already know how dentures affect facial contour below the nose and above the chin. Where there is no support for lips and cheeks due to missing teeth, we add a border moulded flange to lift and support the face. This is what denture esthetics is all about. It is defined as the cosmetic effect produced by a dental prosthesis which effect the desirable beauty, attractiveness, character and dignity of the individual.¹ Complete dentures can make one look younger because there is almost no limit to what dentist can create with it.²

Building out restored teeth to the buccal and labial by bonding veneers and crowns was followed for years to reposition the muscles of facial expression. This helped to restore a youthful appearance.³

WHAT IS ANGELLIFT?

Angellift is one of those unique devices and techniques, available for any adult to look younger and better. It involves the use of a patented techno prosthetic device that is non-invasive, pain free, custom-fitted, and removable. The device is a combination of silicone and nylon resin which reduces and / or removes aging lines, hollow cheek, vertical marionette lines, witch chin

and frown lines around lip, chin and cheek areas. The main objective is to provide dentate patients with immediate and long lasting face lift effects without having surgery, shots, bruising or healing time associated with invasive procedures. (Figure 1)



Fig. 1. Angellift device

FACTORS IN FACIAL APPEARANCE

In dentate patients, the lips rely on two types of support: 1) Intrinsic support from muscles, fibrous connective tissue and glands 2) Support from underlying structures, such as the anterior teeth and associated alveolar bone.^{4,5} Normal facial appearance and skin tone depend on the proper position and functional length of the muscles that attach to the orbicularis oris.⁶ These include the quadratus labii superioris, quadratus labii inferioris, caninus, triangularis, buccinator, risorius, mentalis and zygomaticus.⁷ The loss of support of these muscles combined with laxity of subcutaneous connective

tissue, and fat atrophy result in an ageing facial appearance. There is deepening of nasolabial fold, drooping of corners of mouth, loss of vermillion border of lips with wrinkled appearance. Occlusal wear and loss of vertical dimension make the chin more prominent and contours of philtrum and mentolabial sulcus altered.⁸

HOW DOES ANGELLIFT WORK?

Angellift and Botox work on similar theory of muscle memory. Botox paralyzes the muscles to remove its memory⁹ and Angellift device restricts the muscles, removing muscle memory. Injectable fillers can also be used around the mouth as they fill the space between the skin and the muscles, temporarily removing the wrinkles. Ironically, the same way they remove the wrinkles, they increase the memory which in turn will cause larger and deeper facial wrinkles, once the filler dissipates.

CLINICAL INDICATIONS

This noninvasive device can serve all the people who simply wish to look younger. The Angellift device can help hemophiliacs who desire a face lift but have been unable to undergo invasive procedures. It can help patients affected with Bell's palsy who have unilateral drooping at the corner of the mouth and are unable to smile. Facial asymmetries from cancer surgery and even patients with angular cheilitis can benefit from facial support provided by these devices.

TECHNIQUE

The following is an outline of the steps involved for the fabrication of Angellift device. The dentist should consider completing any oral surgery in addition to any periodontal, orthodontic and restorative procedures. This is important for the overall fit and comfort of the intraoral device especially if any treatment will change the contours of the most distal teeth (where the clasps will be attached) and/or changes the contours of the vestibule. Take before and after photos for cosmetic preview. Make alginate impressions of both upper and lower arches making sure to record the vestibular roll, frenums and the distal most teeth on both the sides where the clasps will be located. A light cured platform is fabricated on the stone model. (Figure 2, 3)

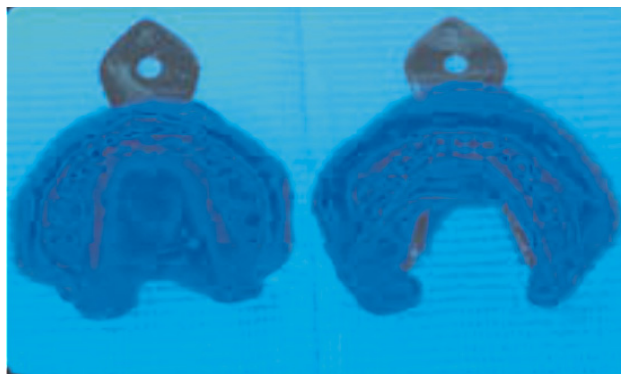


Fig. 2. Alginates with full vestibular roll, frenums, and last molars



Fig. 3. Upper Angellift platform

Place the platforms gently on each arch and be sure they feel comfortable. Place red rope wax on the platforms in designated areas for optimal lift. Place the red rope wax in the vestibule (usually behind the cuspids) especially, when there are any depressed areas on the face. The red rope wax will soften when it is in the mouth. For accuracy of fit, the wax should copy the frenums in functional movements. The waxed platforms are placed on the stone models and processed using a combination of silicone and nylon resin. (Figure 4,5)

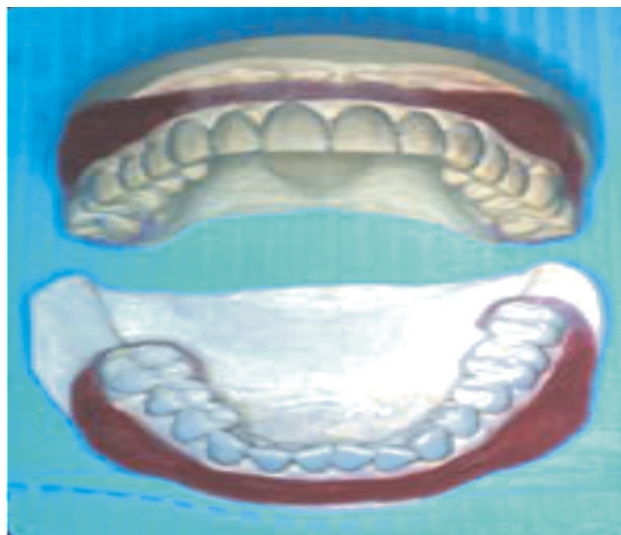


Fig. 4 Waxed-up Angellift platforms



Fig. 5. Angellift-FDA approved intraoral prosthetic device

The Angellift device is placed in the patient's mouth and any modifications are done using pressure indicating paste. It is important to note that, when the appliances are taken out of the mouth, the muscles and skin won't let the face fall immediately to its original form, which makes this transition less noticeable. For daily maintenance, rinse the device under cold water or in proprietary Angellift cleansing solution.

CONCLUSION

The demand for cosmetic procedures is unprecedented. Incorporating this technique into dental practice provides a noninvasive solution for many patients seeking improved facial appearance.

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Risk of Metabolic Syndrome among Children and Adolescents Residing in Mumbai

Subhadra Mandalika¹, Shirin Janoos²

¹Assistant Professor, Department of Foods, Nutrition & Dietetics, College of Home Science, Nirmala Niketan, 49-New Marine Lines, Mumbai, ²Chief Dietitian, Venky's Nutrition, Sr. No 22 Shubh Sanket Plot No 51, Laxman Nagar Balewadi, Baner, Pune

ABSTRACT

Metabolic Syndrome (MS) is defined as a constellation of metabolic disturbances including central obesity, insulin resistance, dyslipidemia and hypertension leading to type II diabetes and cardiovascular diseases. The objective of the present study is to assess the risk of MS among children (9-12yrs) and adolescents (13-15 years) residing in urban Mumbai. Out of 368 participants screened for BMI, WC and family history of lifestyle diseases, eighty nine including 49 children and 40 adolescents were identified to be at risk of developing MS. Information on anthropometry, body composition, biochemical and clinical markers of MS was obtained using suitable methodologies. Results showed normal BMI, but high WC, WHR and total body fat percent among the participants along with interesting gender and/or age specific differences. Boys had a significantly higher mean waist circumference as compared to girls ($\chi^2 = 10.913$, $p=0.001$) indicating a trend of abdominal obesity. The total body fat percent was higher among younger boys than adolescents where as girls showed an opposite trend. Varied trends in biochemical profile included higher TG levels in Girls (9-12 yrs) than boys and lower HDL cholesterol level in boys. Various clinical markers of MS such as Acanthosis Nigricans (90%), hirsutism (>50%) and rebound obesity were identified among the participants. Thus the study emphasizes a need for identification of MS early in life that would facilitate effective prevention strategies to ensure healthy future for youngsters.

Keywords: Metabolic Syndrome, WHR, WC, BMI, Acanthosis Nigricans, hirsutism

INTRODUCTION

Metabolic syndrome' is characterized by a clustering of metabolic abnormalities which lead to increased cardiovascular disease and all-causes mortality¹. The major features of metabolic syndrome include abdominal obesity, insulin resistance, elevated blood pressure, and lipid abnormalities including elevated levels of triglycerides and low levels of high-density lipoprotein [HDL] cholesterol². Among children and adolescents, metabolic syndrome is associated with subsequent risk of type 2 diabetes mellitus and cardiovascular diseases in adulthood³. However, the syndrome can be controlled with effective therapeutic lifestyle interventions if the presence of MS is detected in the earlier phases of life⁴. Thus, the aim of the present study was to identify the proneness of children (9-12yrs) and adolescents (13-15yrs) to metabolic syndrome.

MATERIALS AND METHOD

The study protocol was designed in compliance and approval by the board of management of both schools.

Written consent was obtained from all participants and from their parents/guardians.

A total of 89 participants including children (n=49; 9-12yrs) and adolescents (n=40; 13-15yrs) who satisfied any 2 of the conditions suggested by IDF (2007) (Table-1) were identified as 'at risk' of MS after screening 368 participants from two schools in Mumbai.

Table 1: Identification of children and adolescents at risk of MS⁵

1. BMI	>85 th percentile as per Age and Sex
2. Waist circumference	>90 th Percentile as per Age and Sex
3. Body Fat	Parents and /or Grandparents suffering from ≥ 1 lifestyle disease.

The 'at risk' participants were then assessed for anthropometric (BMI, waist circumference and WHR), clinical and biochemical markers of MS. The total body fat percent was estimated using Body fat analyser (Omron – Model.no: HBF-306).

Clinical markers of MS such as Acanthosis Nigricans (a darkening and thickening of the skin,

usually at skinfold areas), rebound obesity, Hirsutism (an excessive growth of body hair in women at androgen-dependent including lips, chin, chest, abdomen, back, and femoral region) etc. were identified among the participants by visual examination where as Blood Pressure was measured using sphygmomanometer and interpreted as per IDF (2007) guidelines.

Biochemical markers of MS including fasting blood sugar and serum lipids levels of 49 participants (who consented for biochemical analysis) were analysed using commercially available analytical kits.

Data obtained through various tools were analyzed using SPSS package (version 12).

Results & discussion

The various markers of MS recorded from the participants are discussed separately due to their individual and specific contribution to the development of lifestyle diseases.

Anthropometric Markers: The body mass index, waist circumference and waist to hip ratio of the participants showed age specific and gender specific differences as shown and discussed below.

BMI of the participants

BMI values have been given importance as a component for diagnosis of MS in children³. A trend of increasing BMI with age was observed in the sample. Girls were found to have higher BMI as compared to boys (Table No.2).

Table 2. BMI (Mean±SD) of the participants (n=89)

Parameters	Boys		Girls	
	9-12yrs (N=34)	13-15yrs (n=22)	9-12yrs (n=15)	13-15yrs (n=18)
Mean BMI	21.573± 2.445	22.442± 3.217	22.834±2.355	24.830±3.397
Normal values ⁶	14-21	15-24	14-22	15-24

However, CDC suggested that BMI alone should not be considered an effective diagnostic tool for obesity⁶. This necessitated the use of other markers in the assessment of overweight and / obesity in the participants.

Waist circumferences

The distribution of body fat was found to be an important determinant in the expression of risk factors for lifestyle diseases as early as in childhood ⁷. An increased waist circumference has been demonstrated to be a good predictor of cardiovascular disease⁸. Several

studies have considered waist circumference as a better tool for evaluation of MS ^{9,10,11}.

Table 3. Waist circumference (Mean±SD) of the participants (n=89)

Parameters	Boys		Girls	
	9-12yrs (n=34)	13-15yrs (n=22)	9-12yrs (n=15)	13-15yrs (n=18)
Mean Waist circ. (cm)	80.62 ±6.871*	86.18 ±7.042*	78.38 ±3.429†	84.65± 7.211†
Normal values ¹²	69 – 77	80 – 83	62 – 76	78 – 81

*= (p=0.005), †= (p=0.004)

All the participants had significantly higher WC and a highly significant difference in the waist circumferences was found between the age groups ($\chi^2=16.362$, $p=0.000$) (Table. No.3). Interestingly, adolescent boys had a significantly higher mean waist circumference as compared to girls ($\chi^2=10.913$, $p=0.001$) indicating increasing incidence of abdominal obesity (key criteria for pediatric MS, IDF, 2007) among them.

Waist Hip Ratio

The waist hip ratio of the adolescents (13-15yrs) was higher than that of children (9-12yrs), confirming the trends observed earlier for BMI and Waist circumference alone (Table No-4). Thus, inspite of having normal BMI participants of the study showed high lower body fat and thereby a trend towards obesity.

Table 4. WHR (Mean±SD) of the participants (n=89)

Parameters	Boys		Girls	
	9-12yrs (n=34)	13-15yrs (n=22)	9-12yrs (n=15)	13-15yrs (n=18)
Mean WHR	0.923 ±0.032	0.927 ±0.0423	0.865 ±0.028	0.864 ±0.043
Normal ⁶	<0.9	<0.9	<0.8	<0.8

Body fat percentage

A close relationship between body fat distribution and the occurrence of the metabolic syndrome has been established¹³.

Table 5. Body fat % (Mean±SD) of the participants (n=89)

Parameters	Boys		Girls	
	9-12yrs (n=34)	13-15yrs (n=22)	9-12yrs (n=15)	13-15yrs (n=18)
Mean Body fat %	28.232 ±4.329*	24.064 ±5.511*	30.908 ±2.751	33.3 ±4.444
Normal values ¹⁴	10-20%	10-20%	20-30%	20-30%

*= (p=0.003)

All the participants had higher body fat percentage than normal (Table No.5), interestingly, younger boys had significantly higher total body fat than the older ones (13-15 yrs) thus showing a decline in the body fat

with increasing age where as an opposite trend was seen among the girls with the adolescent girls possessing higher body fat than the younger ones, probably due to higher weight consciousness generally seen among adolescent girls.

BIOCHEMICAL MARKERS

Fasting blood sugar

In children, screening recommendations for impaired glucose metabolism have favoured fasting blood glucose (FBG) because of its low cost and greater convenience.

Table 7. Fasting Blood Sugar level (Mean±SD) of the participants

Age groups	Boys(mg/dL)	Girls(mg/dL)
9-12yrs (n=29)	72.25 ±5.25	73.75 ±4.787
13-15yrs(n=15)	72.78 ±6.18	75.00 ±4.082

Normal values ⁵ <100 <100

The fasting blood sugar values of participants were within the normal criteria (Table No.7). However the Expert Committee on the Diagnosis and Classification of Diabetes Mellitus¹⁵ suggested lowering of cut off value for the fasting glucose levels for children.

DYSLIPIDEMIA

Lipid abnormalities, particularly high triglycerides and low HDL-C, are strongly associated with insulin resistance¹⁶ and are criteria for MS in children and adolescents^{5, 17}.

Table 8. Serum lipid levels of the participants (Mean ± SD)

Parameters	Boys		Girls	
	9-12yrs (n=20)	13-15yrs(n=9)	9-12yrs (n=5)	13-15yrs(n=10)
Triglycerides (mg/dL)	98.325 ±31.671	107.144 ±37.484	135.375 ±45.213	107.5 ±24.810
Normal values ¹⁷	<110	<110	<110	<110
HDL Cholesterol (mg/dL)	38.4 ±4.751	40.06 ±6.023	43.75 ±6.292	42.7 ±6.378
Normal values ⁵	>40	>40	>40	>40
Total Cholesterol (mg/dL)	164.190±24.878	148.411±25.423	170.375± 14.545	161.080±27.2401
Normal values ¹⁸	<170	<170	<170	<170

Except the girls of 9-12yrs, all the other participants had normal TG levels in the study where as a trend of low HDL Cholesterol levels was observed among the boys. The WHR and HDL cholesterol of the participants showed significant negative correlation ($\chi^2=-.302^*$, $p=0.026$), reflecting the adverse effect of abdominal fat

on lipid profile and thereby the risk for the development of MS among them. These results fall in line with the findings of a study which reported low HDL cholesterol among obese children and adolescents aged 10–18 years from northern Mexico¹⁹.

Clinical markers/symptoms

A) Hypertension

Hypertension is an integral component in the evaluation of MS⁵ which might appear in adolescence and perhaps even in childhood²⁰. A strong association between childhood hypertension and adult MS was also reported²¹.

Table 9. Blood Pressure values of the participants (Mean±SD) (n=89)

Parameters	Boys		Girls	
	9-12yrs (n=34)	13-15yrs (n=22)	9-12yrs (n=15)	13-15yrs (n=18)
Mean systolic (mmHg)	109.18 ±10.449	111.81 ±10.6	109.08 ±12.433	114.11 ±8.871
Cut off values (mmHg) ⁵	>130	>130	>130	>130
Mean diastolic (mmHg)	76.41 ±6.597	74.95 ±6.576	76.54 ±8.432	80.39 ±6.581
Cut off values (mmHg) ⁵	>85	>85	>85	>85

The mean systolic and diastolic BP of the participants was found to be normal (Table.No.9). However, high systolic blood pressure was reported earlier among children with high BMI, bodyweight, triceps skin fold thickness and percent body fat²² thus implying that obesity might induce hypertension. Certain other clinical symptoms such as Acanthosis Nigrans, Hirsutism, Rebound obesity might also indicate susceptibility to MS²³.

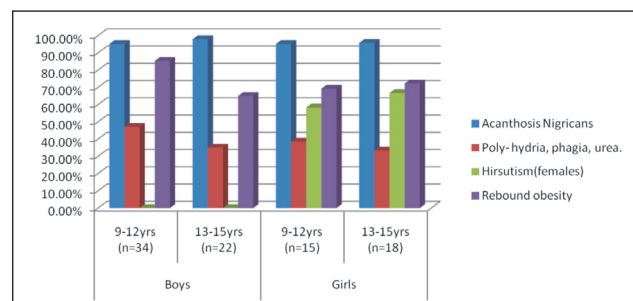


Fig. 1. Percentage depicting the presence of other clinical symptoms of metabolic syndrome in the participants (n=89)

More than 90 percent of the participants showed Acanthosis Nigrans which was also reported earlier among 90% of patients with type 2 diabetes mellitus²⁴ and in a subset of overweight children and adolescents²⁵. Insulin-resistance and polycystic ovary syndrome

may be responsible for hirsutism of gradual onset²⁶. More than half of the female participants showed hirsutism. The thrifty 'catch-up fat' phenotype or rebound obesity may have an impact on insulin sensitivity. Infants and children, who show catch-up growth, or adiposity rebound at a younger age, are predisposed to the development of obesity, type 2 diabetes and cardiovascular diseases later in life²⁷. More than half of the participants confirmed to having rebound obesity, with the same being higher among boys of 9-12yrs and adolescent girls (Figure -2). This might be due to weight consciousness and the temporary weight reduction measures adopted by youngsters in the study.

Family History of MS among the participants

Since CVD aggregates in families²⁸, parental history of CVD is accepted as a measure of the offspring's cardiovascular risk and has been used in prevention and intervention algorithms²⁹. It has been reported that the risk of adult obesity among children >10 years old to be more than double if one parent was obese³⁰.

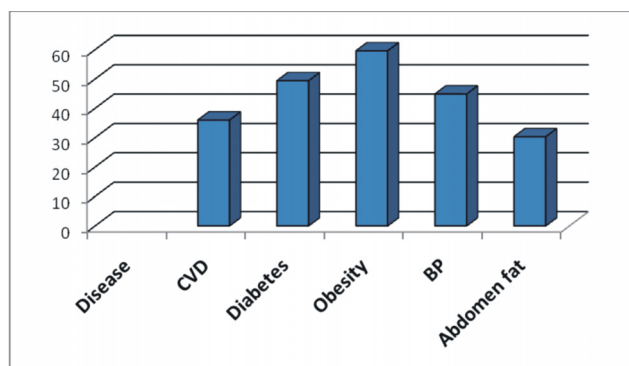


Fig. 2. Family history of lifestyle diseases among the participants selected for the Phase 2 of the study (n=89)

In the present study, only 12% of participants showed strong family history of lifestyle diseases (present in parents as well as grandparents) with majority of them having family history of obesity followed by diabetes and hypertension. Thus, apart from being overweight or obese, these participants had a higher risk for the development of MS in the future (Figure No.2)

CONCLUSION

Results of the present study revealed a possible risk of metabolic syndrome among children and adolescents. The study also indicates an urgent need for suitable strategies towards achievement and

maintenance of healthy body composition from early stages of life.

Conflict of Interest

We hereby declare that the study has been conducted with ethical and moral considerations and does not have any conflict of interest with any concerned party.

ACKNOWLEDGEMENT

We acknowledge the schools for permitting the authors to conduct the study, the enthusiastic children and adolescents for participating in the study, their parents for their the constant support and the CB Patel research institute for the technical support in the biochemical analysis.

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Seroprevalence of Hepatitis C Antibodies in Healthy Blood Donors in Western U.P India

Surabhi Tyagi¹, Geeta Deshmukh², Alok Tyagi³

¹Asst.Professor, Pathology, School of Medical Sciences & Research, Sharda Hospital Greater Noida, U.P., ²Professor, Pathology, School of Medical Sciences & Research, Sharda Hospital, Greater Noida .U.P., ³Consultant Pediatrician in Ghaziabad & Greater Noida

ABSTRACT

Blood transfusion is an effective mode of transmission of hepatitis C infection. In developed countries various measures have been taken to reduce the spread of infection through this route. In India, mandatory screening for HCV was introduced as late as 2002 though it was started in Japan & US in 1990. Still, the studies all over India suggest that despite testing of blood units HCV infection is still a significant problem.

HCV is transmitted by blood to blood contact. In developing countries about 90 % of persons with chronic HCV were infected through transfusion of unscreened blood or blood products or via intravenous drug abuse or sexual exposure. Also, in developing countries, the primary sources of HCV infection may be unsterilized injection equipment.

The present study was conducted to find out seroprevalence of hepatitis C in 6000 donors in greater noida. The screening was done by ELISA third generation microelisa kit.

Seroprevalence of anti HCV in 6000 donors was 1.28 % with the prevalence of 1.34 % in voluntary & of 1.28% in replacement donors.

Males show higher incidence of 1.29% & females 0.66 %.

Blood group B negative showed higher positivity (1.886%) followed by A positive (1.408%) closely followed by O positive (1.4008%).

Age group >51 yrs show positivity of 5.405% followed by age group of 31-40 yrs (1.745 %)

Keywords: HCV- hepatitis - C virus, seroprevalence, Blood Donors, ELISA

INTRODUCTION

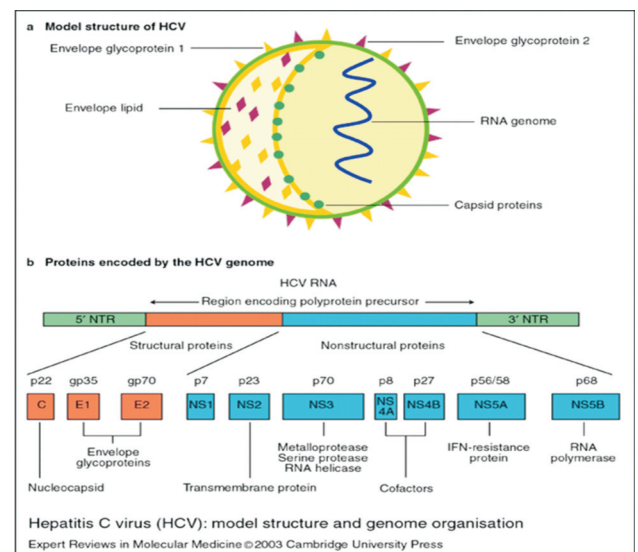
Hepatitis C is an emerging infection in India. It was first detected in 1989 using molecular biology techniques after extensive testing of serum from experimentally infected animals

It was later characterized to be an RNA virus that belongs to the flavi-viridae family & genus hepaci virus.

Ever since its discovery it became clear that it was a major cause of acute hepatitis after blood transfusion. Its association with hepatocellular CA underscores its public health importance.

Blood transfusion is an effective mode of transmission of HCV. After introduction of compulsory blood screening, its incidence has dropped.

Fig.1



Intravenous & percutaneous drug usage is also an emerging important concern.

Renal transplant patients, patients on hemodialysis, health care workers and jail inmates' kala azar patients in endemic areas are also at high risk.

STD's & HCV are expected to go hand in hand due to their similar modes of transmission.

MATERIAL & METHOD

The present study was conducted on 6000 blood donors in the School of Medical Sciences & Research, Sharda University, Greater Noida, National capital region.

The HCV antibodies were tested by ELISA technique using third generation HCV microelisa kit supplied by J.Mitra & Co.Ltd.

The seropositive samples were again tested on ELISA kits of RFCL &/or BIORAD for further confirmation & ruling out any false positive or false negative results.

OBSERVATIONS/FINDINGS

In the present study, anti HCV positivity among 6000 blood donors was 1.28% (77/6000).

Seroprevalence in voluntary donors was 1.34 % (4/297)

Seroprevalence in replacement donors was 1.28 % (73/5703)

Following tables show distribution of anti HCV positive blood donors based on age, sex, blood groups in this study –

Table 1: Distribution of anti –HCV positive blood donors based on sex

Sex	Voluntary			Replacement	
	Total donors	Anti – HCV positive	Total donors	Anti-HCV positive	Total %
Male	269	04	5581	72	1.29%
Female	28	00	122	01	0.66%
Total	297	04	5703	73	1.28%

Table 2: Distribution of anti –HCV positive blood donors based on blood groups

Blood group	Total blood donors	Anti –HCV positive	Total %
A positive	1349	19	1.408
A negative	93	00	00
B positive	1964	24	1.221
B negative	159	03	1.886
O positive	1856	26	1.4008
O negative	125	01	0.800
AB positive	429	04	0.9324
AB negative	25	00	00
Total	6000	77	

Table 3: Distribution of anti –HCV positive blood donors based on age

Voluntary						Replacement			
Age (yrs)	Total number of cases	%	No. of positive cases	%	Total number of cases	%	No. of positive cases	%	% of total positive cases
≤ 20	43	14.47	-	-	480	8.41	04	0.833	0.764
21 -30	129	43.43	02	1.55	3353	58.79	37	1.103	1.120
31-40	93	31.31	02	2.150	1511	26.49	26	1.720	1.745
41 – 50	26	8.75	-	-	328	5.75	04	1.219	1.299
≥ 51	06	2.02	-	-	31	0.54	02	6.451	5.405
Total	297		04		5703		73		

DISCUSSION

It is well documented that HCV is transmitted through blood. Main mode of infection is transfusion of unscreened blood or blood products, drugs, sexual exposure.

There are many studies all over the world indicating different prevalence rates of HCV antibody in blood donors.

Table 4 - Seroprevalence of Hepatitis C in blood donors in India

State	Year	% HCV	Author
North India	1992	2.50	Sood et al
North India	1993	2.20	Narang et al
Delhi	1995	1.5	Irshad et al
Delhi	1997	1.85	Panigrahi et al
Delhi	1999	0.53	Makroo et al
Delhi	1999	1.57	Jain et al
Delhi	1999	0.5	Singh et al
Ludhiana	2001	0.7	Kaur et al
Ludhiana	2001	1.50	Gupta & Kaur
Patiala	2003	0.88	Per meet et al
Punjab	2004	1.09	Gupta et al

In the present study prevalence of anti –HCV was 77 (1.28 %) out of 6000 blood donors.

This is in accordance with the previous studies in and around NCR.

The present study does not match with the high figures of 26.6% by Bassily et al¹ (1995) ,15.90% by Gosavi ²et al (1997).

Males show higher incidence of (1.29 %) than females (0.66 %) .

Makroo et al ³(1996) & Patino – Sarcinelli et al, 1994, concluded from their study that HCV seropositivity was strongly associated with male sex.

Maximum anti –HCV seropositivity was seen in donors belonging to ≥ 51 yrs (5.405%) , followed by 31- 40 yrs age group (1.745 %) .

With increasing age, anti – HCV positivity was found to increase significantly. Similar observations were made by Sirchia et al ⁴(1989) & Patino- Sarcinelli et al (1994)

It was also observed that blood group B negative showed higher positivity (1.886%) followed by A positive (1.408%), closely followed by O positive (1.4008%).

Seroprevalence in voluntary donors is slightly higher (1.34%) than in replacement donors

This may be due to the awareness of free screening facility associated with blood donation donors come for voluntary donation to remove their fear of infection when in doubt.

Mechave & Dhot ⁵(1999) did a similar comparative study in voluntary & replacement donors & showed that seropositivity was higher in replacement donors than in voluntary donors. This is different from this study.

Only one study was available for comparison, Per meet et al⁶ (2003) Patiala, which shows increased prevalence in blood group O. Difference may be due to regional variation.

However, no other earlier reports could be traced to access the preferential preference, if any, of HCV to any blood group.

CONCLUSION

Hepatitis C is an emerging infection in India whose long term implications will be felt in the decades to come.

As the incidence of post transfusion hepatitis C infection decreases considerably after screening the blood for anti –HCV, it should be a mandatory routine.

Though, the cases in their “window period” escape detection still, the risk is reduced considerably.

Stringent blood banking laws & public awareness to donate blood repeatedly & restrain based on self deferral are important.

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Blood Groups and Periodontal Disease- A Review

Surangama Debnath¹, Vijay Sunil Reddy²

¹Professor & HOD, Dept. of Periodontics, Navodaya Dental College, Raichur, ²Reader, Dept. of Periodontics, Navodaya Dental College, Raichur, Karnataka

ABSTRACT

Studies in the past have investigated the relationship between blood type and dental caries. Limited efforts have been made to investigate the relationship between ABO blood group and periodontal disease. Knowledge of the ABO blood groups of patients and their association with the severity of periodontal disease maybe important in the development of early treatment strategies, and it would help to target non-responding areas to periodontal therapy of highly susceptible individuals. This review aims to discuss the association between ABO blood group and the severity of chronic periodontitis.

INTRODUCTION

The first human blood group, that is, the ABO system discovered by Landsteiner, is the most commonly used blood system although many blood systems have been identified so far. The discovery of ABO system and findings of red cell agglutination in serum and recognition of blood groups laid the scientific basis for safe practice of blood transfusion. The other important blood group systems are the Rhesus (Rh) and the MN system. ABO and Rh systems have major clinical significance and they are determined by the nature of different proteins present on the surface of red blood cells. The antigens of the ABO system are an integral part of the red cell membrane and they are also found in plasma and other body fluids.^{3,5}

All human populations share the same blood systems, although they differ in the frequencies of specific types. The distribution patterns of ABO and Rh systems are complex around the world. Some variation may even occur in different areas within one small country. The blood group distribution also shows variety according to races. It was reported that the group A has a wider distribution in Eskimos, the group B in Chinese and Indians, the group O, on the other hand, in Americans and Canadian Indians and Czechoslovakians and those living in Kenya. When the rate of Rh+ is considered, it was reported to be about 85% in all the population. ABO blood groups are the most investigated erythrocyte antigen system and owing to ease of identifying their phenotypes, they have been used as genetic markers in studies of their associations with various diseases. Studies from the 1950s demonstrated that blood group O is associated with duodenal ulcer disease, while gastric ulcer and gastric carcinoma are associated with blood group A. During the last few decades several reports have suggested that

ABO blood groups, in particular non-O blood groups are associated with the risk of ischemic heart disease and of developing severe manifestation of atherosclerosis^{12,13}. Although several studies have been carried out to investigate relationships between the ABO blood groups and the incidence of certain diseases in medicine, little investigation has been made to explore the relationship between ABO blood groups and the incidence of oral and dental diseases.

SIGNIFICANT STUDIES AND FINDINGS

Pradhan et al¹⁷ studied the relationship between periodontal disease and blood groups and secretor status.

Demir et al⁹ conducted a study on 1351 subjects, 647 male and 704 female, aged 17 to 63. The selection criteria were the following:

- I. All subjects had at least 20 teeth and had received no periodontal treatment or antibiotic related therapy for medical or dental reasons 3 months prior to the studies.
- II. They had no history of systemic disease such as diabetes, leukaemia, metabolic bone disease or epilepsy.
- III. They were non smokers.
- IV. They had similar socio-economic status.
- V. The gingivitis subjects displayed less than 3mm of attachment loss, periodontal pocket depth less than 3 mm, no radiographic bone loss but displayed signs of gingivitis. Periodontitis subjects exhibited at least one site evidence of radiographic bone loss, attachment loss more than 3 mm, periodontal

pocket depth more than 4 mm. Healthy subjects displayed less than 3 mm of attachment loss, periodontal pockets depth less than 3 mm, no radiographic bone loss and no gingivitis sign.

The subjects were examined clinically for the presence of plaque, gingival bleeding, clinical attachment level, probing pocket depth. Demir et al⁹, divided the subjects into 3 groups according to the index scored. Then the subjects in all three groups were sent for determination of ABO blood subgroup. In the 1351 blood samples surveyed, the blood group A (48.5%) and the blood group O (30.3%) were more common, 89.9% had factor Rh positive and 10.1% had factor Rh negative.

From the data, one finds a higher frequency of periodontal diseases in subjects with group A and O. This is a relatively high percentage of blood group A patients (61.5%) in gingivitis and relatively high percentage of blood group O patients (41.5%) with periodontitis. This study found no significant difference regarding the distribution of Rh factor.

In another significant study by Ghamdi¹¹, data was collected from 161 patients with chronic periodontitis. Medical history, dental history, and periodontal parameters (such as probing depth, clinical attachment loss, and distance from cement-enamel junction to gingival margin, furcations, and mobility and missing teeth) were recorded. Blood samples were analyzed to determine blood group and Rhesus factor. The mean age of the study sample was 34.5 years. Significant relationships were determined between ABO blood type and the severity of chronic periodontitis. Patients with group B were found to be at greater risk of developing more severe form of periodontitis.

Gawrzewska¹⁰ found that individuals with blood group O have greater severity of periodontal disease, whereas individuals with blood group A have greater resistance to periodontal disease. Kaslick et al¹⁵ found that periodontitis patients were likely to have A or B blood groups.

Frias and Lopez²⁰ concluded that there is no association between secretor status of ABO blood group and juvenile periodontitis. However, Arowojolu et al⁸ found that all juvenile periodontitis patients had either blood group B or AB and all were Rhesus positive, whereas non-juvenile periodontitis patients included those with blood groups B or O who were Rh-positive or Rh-negative and those with blood groups AB were Rh-positive. The sample sizes in the latter studies were small and the results cannot be generalized.

Suk found out that ABO blood types had an increased effect on the risk for the development of oral

diseases. On the contrary, Barros and Witkop stated that there were no significant differences between subjects with or without periodontal disease regarding ABO blood group.¹¹

CONCLUSIONS

Significant relationships between ABO blood type and periodontal condition, Rh factor and gingivitis were determined. Patients with blood group B appear to be at greater risk of developing more severe forms of periodontitis. Thus it can be concluded that ABO blood subgroups and Rh factor could constitute a risk factor on the development of periodontal disease. However, long-term studies are needed to make a more comprehensive assessment of the effects of ABO group on periodontal diseases.

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Profile of Attendees for Voluntary Counselling and Testing in the VCTC, Tirupati, Chittoor District, Andhra Pradesh

N Swarnlatha

Associate Professor, Department of Community Medicine, Dhanalakshmi Srinivasan Medical College, Siruvachur, Perambalur (District), Tamil Nadu

ABSTRACT

Background: The growing menace created by the HIV/AIDS has alarmed not only the public health officials but also the general community. The Voluntary Counseling and Testing centre remodeled as Integrated Counseling and testing Centres are reversing the epidemic.

Objectives: To identify the socio-demographic profiles, HIV sero-status and risk behavior pattern of the attendees in the VCTC attached to a Medical College Hospital in Tirupati, A.P.,

Study Design: Cross-sectional observational study.

Setting: Voluntary Counseling and Testing Centre attached to Microbiology Department of the Medical College, Tirupati.

Participants: All the VCTC attendees between January 2011 and March 2011 were included in the study

Study variables: Age, sex, marital status, level of education, occupation, place of residence, HIV sero-status, pattern of risk behavior in relation to HIV/AIDS and the person referring.

Statistical Analysis: Proportions and chi-square test.

Results: It was found that out of 2863 individuals, 11.4% were sero-positives. Sero-positivity was high in 20-49 years age group (79.4%), illiterates (45.8%), unskilled workers (39.1%), rural areas (60.3%) and married (71.7%) individuals.

Keywords: *Integrated Counseling Testing Centres, Voluntary Counseling and Testing Attendees, HIV Sero Status, Socio-Demographic Profile*

INTRODUCTION

From a mysterious illness recognized in the early 1980s, HIV/AIDS has established itself into a global pandemic in less than 20 years. In 1986, the first known case of HIV was diagnosed by Dr. Suniti Solmon amongst female sex workers in Chennai¹. Despite being home to the world's second-largest population suffering from HIV/AIDS, the AIDS prevalence rate in India is lower than in many other countries. In 2007, India's AIDS prevalence rate stood at approximately 0.3% and 89th highest in the world². The spread of HIV in India is primarily restricted to the southern and north-eastern regions of the country and India has also been praised for its extensive anti-AIDS campaign³.

According to AIDS epidemic update, December 2009 released by UNAIDS and World Health Organization (WHO), there are approximately 33.4 million people living with HIV/AIDS worldwide contributing to the prevalence rate of 0.8%. In South East Asia, the prevalence is around 0.3% (AIDS Epidemic Update 2010)⁴. The total number of people living with HIV in Asia is thought to be almost 4.9 million⁴. Around half (2.4 million) of these are in India followed by China (740,000). Overall, the average prevalence rate of HIV in Indian adults (15 years and above) is approximately 0.34%. While this may seem low, because India's population is so large, it is third in the world in terms of greatest number of people living with HIV. With a population of around a billion,

a mere 0.1% increase in HIV prevalence would increase the estimated number of people living with HIV by over half a million⁶. As per the HIV Estimations 2010, in India it is estimated that adult HIV prevalence as 0.31%. Adult HIV prevalence among men is 0.36% while among women, it is 0.25%⁷. In Andhra Pradesh, the adult HIV prevalence among men is 1.07% while among women it is 0.73%⁸.

The Voluntary Counseling and Testing Centre now known as Integrated Counseling and Testing Centre provides a key entry point for the 'continuum of care in HIV/ADIS' in all segments of the population. It is a cost-effective intervention in preventing the spread of HIV transmission in resource poor countries⁹ which provides an opportunity to learn and accept the HIV status in a comfortable, convenient and confidential manner¹⁰.

The data collected in the present study from the ICTC of tertiary care hospital in Tirupati may provide important clues regarding the epidemiological profile of attendees and also those found positives. This information will be useful in planning the local interventions for preparing the local action plan and implementing the information, education and communication (IEC) and behavior change communication (BCC).

MATERIALS AND METHOD

The present study was conducted in the ICTC (general) of tertiary care hospital, Tirupati from January to March 2011. The socio-demographic data of all the attendees were collected (as per NACO guideline) on predesigned schedule under strict confidentiality. This information was recorded when the client visited the VCTC for the first time and most of them were unaware of their HIV status. After the pretest counseling and obtaining the consent from the attendees, blood samples were collected. As per the policy prescribed by NACO, HIV was confirmed by performing enzyme-linked immunosorbent assay (ELISA) by using two different antigens and a rapid test. The prior approval was taken from the appropriate authorities. Data was complied and analyzed in EPI INFO Package.

RESULTS

Majority of the attendees (62.6%) belonged to 20 – 49 years age group. Seropositivity was significantly highest in the age group of 20 – 49 years (78.9%) compared to other groups and the difference was statistically significant ($\chi^2=53.9$; $P<0.001$; S). 63.8% study subjects were males and the sero-positivity was also higher in males (61.5%) than that in females (38.5%) but the difference was however not statistically significant ($\chi^2 = 0.80$; $P > 0.37$ ns) (Table 1).

Table 1: Distribution of HIV positivity according to Age and Sex

Age Group	HIV Positivity (n=325)			HIV Negativity (n=2538)			Total (n= 2863)	
	Male	Female	Total	Male	Female	Total		
	No %	No %	No %	No %	No %	No %	No	%
< 14 years	7 *(2.2)	11 (3.4)	18 (5.5)	94(3.7)	60(2.4)	154(6.1)	172	6.0
15 – 19 years	1 (0.3)	3 (0.9)	4 (1.2)	55(2.1)	29(1.1)	84(3.3)	88	3.1
20 – 29 years	28 (8.6)	39 (12.0)	67 (20.6)	299(11.8)	210(8.3)	509(20.0)	576	20.1
30 – 49 years	130 (40.0)	61 (18.8)	191 (58.8)	641(25.3)	386(15.2)	1027(40.5)	1218	42.5
> 50 years	34 (10.4)	11 (3.4)	45 (13.8)	537(21.2)	227(8.9)	764(30.1)	809	28.3
Total	200 (61.5)	125 (38.5)	325 (100.0)	1626(64.1)	912(35.9)	2538(100.0)	2863	100.0

* Percentages are indicated in parenthesis

In the present study, 43.1% were illiterate. Seropositives were higher among those who were illiterate (45.8%) and those educated up to primary level of education (34.5%). There is inverse relationship among HIV positivity and literacy level. It is found that literacy is significantly associated with HIV positivity ($\chi^2= 10.13$; $P=0.02$ S).

It was found that 41.8% were engaged in unskilled occupation and the seroprevalence was also highest among unskilled workers (39.1%) followed by housewives (32.3%). The differences in relation to

occupation were also statistically significant ($\chi^2 = 31.53$; $P < 0.001$; S).

The Seropostivity was high among married individuals (71.7%) than those living singly (16.9%) and the difference was also significant ($\chi^2 = 13.86$; $P < 0.001$; S).

According to the place of residence 59.8% were from rural areas and the seropositivity was higher in rural background (60.3%) compared to urban area (39.7%) but the difference however is not significant ($\chi^2 = 0.06$; $P > 0.80$; NS) (Table 2).

Table 2: Social Profiles and HIV sero-status of the VCTC Attendees (n=2863)

Social Profile	HIV Status				Total(n=2863)	
	HIV Positive(n=325)		HIV Negative(n=2538)			
	No	%	No	%	No	%
HIV Sero-status by Education						
Illiterate	149	45.8	1086	42.8	1235	43.1
Primary	112	34.5	1010	39.8	1122	39.2
Secondary	34	10.5	303	11.9	337	11.8
College & Above	30	9.2	139	5.5	169	5.9
HIV Sero-status by Occupation						
Unskilled	127	39.1	1071	42.2	1198	41.8
Semi-skilled	12	3.7	101	4	113	3.9
Skilled	27	8.3	113	4.5	140	4.9
Housewife	105	32.3	688	27.1	793	27.7
Retired	1	0.3	12	0.5	13	0.5
Student	12	3.7	234	9.2	246	8.6
Agriculture	30	9.2	155	6.1	185	6.5
Others	11	3.4	164	6.5	175	6.1
HIV Sero-status by Marital Status						
Married	233	71.7	1885	74.3	2118	74
Single	55	16.9	483	19	538	18.8
Divorced/Separated	7	2.2	18	0.7	25	0.9
Widowed	30	9.2	152	6	182	6.3
HIV Sero-status by place of Residence						
Urban	129	39.7	1022	40.3	1151	40.2
Rural	196	60.3	1516	59.7	1712	59.8

It was found that 6.4% were migrants, 1.7% attendees were female sex workers. The Seropositivity was found to be highest among migrants (5.9%) and truckers (5.6%) (Table 3)

Table 3: Pattern of Risk Group and HIV Serostatus of the VCTC Attendees (n=2863)

Risk Group	HIV Status				Total(n=2863)	
	HIV Positive(n=325)		HIV Negative(n=2538)			
	No	%	No	%	No	%
TB (Pulmonary)	9	2.8	60	2.4	69	2.4
TB (Extra-pulmonary)	0	0.0	2	0.1	2	0.1
STI	3	0.9	18	0.7	21	0.7
MSM	1	0.3	1	0.0	2	0.0
FSW	0	0.0	49	1.9	49	1.7
IDU	0	0.0	13	0.5	13	0.5
Truckers	18	5.6	37	1.5	55	1.9
Migrant	19	5.9	163	6.4	182	6.4
Others	275	84.5	2195	86.5	2470	86.3

The study found that 17.6% attendees were heterosexuals and parent to child transmission being 2.6%. It was found that in 79.0% cases, risk behaviour was not specified. HIV seropositivity was high in heterosexuals (36.9%) (Table 4)

Table 4: Pattern of Risk Behaviour and HIV Serostatus of the VCTC Attendees (n=2863)

Risk Behaviour	HIV Status				Total(n=2863)	
	HIV Positive(n=325)		HIV Negative(n=2538)			
	No	%	No	%	No	%
Heterosexual	120	36.9	382	15.1	502	17.6
Homosexual	0	0.0	3	0.1	3	0.1
H/O Blood transfusion	0	0.0	1	0.0	1	0.0
Parent to child	11	3.4	64	2.5	75	2.6
Injecting Drug users	0	0.0	20	0.8	20	0.7
Not Specified	194	59.7	2068	81.5	2262	79.0

It was found that 76.0% attendees were referred by Govt. health facility, 12.3% came directly. Among these attendees, the HIV seropositivity was 56.0% in those referred from Govt. health facility (Table 5).

Table 5: VCTC Attendees by Referral

Referred by	HIV Status				Total(n=2863)	
	HIV Positive(n=325)		HIV Negative(n=2538)			
	No	%	No	%	No	%
Non-TI NGO	17	5.2	245	9.7	262	9.2
Govt Health Facility	182	56.0	1994	78.6	2176	76.0
Private Health facility	62	19.1	9	0.4	71	2.5
Self	64	19.7	290	11.3	354	12.3

DISCUSSION

The HIV prevalence in the present study (11.4%) was found to be higher compared to studies from Southern Karnataka (9.6%) in 2007¹¹ and Ahmedabad (4.8%)¹² in 2007 but lesser than the study from West Bengal (17.1%)¹³ in 2003. Higher prevalence reported in this study may be due to the fact that Tirupati is a pilgrimage centre where migrants and truckers population is significantly high.

According to the study, 65.7% of the subjects belonged to the age group of 15 – 49 years which is lower than the national figure (90.0%) and from another study (79.7%) conducted at a VCTC in Ahmedabad¹². An alarming fact was observed in this study that the prevalence is catching up in 20 – 29 years of age group (20.6%) though it is still highest in 30 – 49 years age (58.8%) indicating that AIDS still threatens the most productive segment of society in the prime of their working life. It emphasizes the need of some youth specific interventions or some school or college based interventions whereby these people can be prepared beforehand.

Males (63.8%) accessed the services more than the females (36.2%) in this study which is in accordance to the national figures and indicates the existence of some barriers preventing the access of females even now. The present study highlights the fact that males

contributed to 61.5% of the case load in VCTC with 38.5% being the females which is in accordance to the national figures (38.4% for females). Such a high proportion of infection rate in females is a cause of concern since this will lead to a proportionate increase in the children being infected due to transmission from mother to child. Infection rates among women/newborns are rising mainly due to women's inability to negotiate for safe sex and their pushing into the early marriages.

Everyone, whether male or female, who was counseled underwent the testing, which indicates the effectiveness of counseling. Education and job status showed inverse relationship with the prevalence. There is a decrease in HIV prevalence as the educational level is increasing (Illiterates 45.8% vs College and above 9.2%). Since sex education is not included in school curriculum, anyone who is illiterate or educated up to secondary level will not have adequate knowledge for protecting himself/herself from STDs including HIV/AIDS. A substantial number HIV positives were contributed by males, married and living with their families. These people, if not informed, will soon be infecting their spouse and enhancing the risk of parents to child transmission resulting in more and more "AIDS orphans".

With regard to occupation, 39.1% unskilled workers are seropositive because their literacy level may be low

and thereby awareness may also be low regarding mode of transmission and prevention of HIV/AIDS. Seropositivity is also high among housewives (32.3%) possibly due to lower awareness among women. High number of seropositives among the housewives is a matter of great concern and it might be an indication of increased HIV transmission in the area. Creation of awareness should be enhanced among rural population especially among females and adolescent girls.

In the current study, 60.3% HIV positives are from rural areas compared to 39.7% in urban areas. This may be due to lack of knowledge about mode of spread and prevention aspect of HIV/AIDS. In general, it is observed that awareness and knowledge of HIV/AIDS remains low in rural areas and among women¹⁴. As per 2001 census, 47% of people in India and 13.1% in Andhra Pradesh were aware that HIV/AIDS could be prevented by consistent condom use and having a faithful uninfected partner.

Present study found 17.6% attendees had history of heterosexual contact, 2.6% had parent to child transmission, which is supported by the findings of another study from eastern India¹⁵. It was found that 59.7% of seropositives did not specify any risk behavior. This can be attributed to the fear of discrimination or punishment, which still prevails in the society toward HIV-infected individuals which can be overcome by creating increase awareness and adaptation of safe behavioral practices by planning and designing the IEC activities keeping in mind the specific situations of the area.

12.3% of subjects (19.7% of HIV Positives) coming to VCTC on their own without being referred by someone else. This was in contrast to the figures reported from a study in Chennai (2004-05) where only 3 of the total 89 HIV positive patients had visited voluntarily for testing¹⁶.

Referral from TI –NGOs was low in this study because of the fact that no TI is operating in the nearby areas. Yield of positives among those who attended directly was higher than those who were referred by doctors. Arrival of such clients at ICTC depends upon the IEC activities in the catchment areas carried out by general system or by the staff at ICTC itself.

CONCLUSION

In this study it was found that HIV positivity was high in 20 – 49 years age group and main mode of

transmission was heterosexual. Health education regarding safe sexual practice, avoidance of extramarital sex would go a long way in preventing the spread of HIV infection in the community. In the present study, it is shown that literacy is significantly associated with the spread of HIV positivity. It is difficult to literate them but it is possible to interrupt the transmission by giving them proper health education with the help of video films, charts and posters. To prevent mother to child transmission it is necessary to educate mothers and adolescent females regarding benefits of antenatal care and making HIV testing mandatory in antenatal clinics

RECOMMENDATIONS

Improvement of IEC and HIV/AIDS awareness is one of the most effective strategies to control HIV/AIDS. A successful communication program helps to promote behavioural change and increases the knowledge regarding the disease. Such programs will be more effective if conducted in local languages and using the locally derived data. Such intensive IEC will improve the uptake of VCT services by the target population.

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Prevalence of Postural Pain among School Going Children in Meerut, India- A Cross Sectional Study

Ujjawal Singh Tomar¹, Nalina Gupta²

¹MPT Student, ²Head, Department of Physiotherapy, College of Applied Education and Health Sciences, Meerut, India

ABSTRACT

Background: The study was conducted to find out the prevalence of MSD (Musculoskeletal disorder) among school going children and also to find out its association with BMI (Body Mass Index), number of sitting hours and weight of back packs.

Method: It's a cross sectional study. The total of 195 students was taken in the study. The study was done by means of Questionnaire. Questionnaire was distributed to class XI and XII students of Public school in Meerut. Data was analyzed using descriptive statistics.

Results: 19.5% of students complained of postural pain. out of those students who complained of pain, 39.5% (15) complained of back pain, 34.2 % (13) complained of neck pain & 26.3%(10) complained of pain in other areas. The students having no pain were 79% (154), and 15.4% (3) did not mention about pain.

Conclusion: There is prevalence of neck pain and back pain among school going children and postural pain was also related to weight of back-pack, number of sitting hours and Body Mass Index (BMI)

Keywords: Neck Pain, Back Pain, School Children, Postural Pain

INTRODUCTION

In recent times parents have concern about the weight of children's school bags and consequences of carrying such loads.¹Epidemiological studies over the last 20 years reported mounting non specific back pain prevalence among youngsters. The evidences related to spinal loading suggest that biomechanical factors might also be related to back pain at young age. The limited literature supports the presumption that the school environment exposes the children to possible limited factors related to prolonged poor sitting, absence of appropriate furniture and back pack use.²

The spinal structures are quite different from those of adults. As the growth of spinal structures continues over the long period of time than the other skeletal

structures, there are dissimilarities in the rate of tissue development, which can pose a threat to postural integrity. It is also reported that with the load placed posterior to body in the form of back pack and alteration in the COG, it causes the change in posture. These alterations may lead to back pain and injury by stressing the ligaments or muscles in the back or by changing the forces applied to IV discs.³

Nowadays due to underlying physical condition and type of work also affecting the younger people/ generation, specially the school children and university students. Although educational institutions are increasingly looking to IT for new models of teaching and learning. The sequel of poor posture when using computers for eg. may be particularly detrimental to rapidly developing spines and ligaments of children who usually spend around one-third of their waking hours in.⁴

In Switzerland, Gierlach found that physicians often treat children 10 years and younger for back pain possibly a reflection of the increasing proportion of sedentary and static activities among their demographic.

Corresponding author:

Ujjawal Singh Tomar

Department of Physiotherapy,
College of Applied Education and Health Sciences,
Gangotri, Roorkee Road, Meerut-250001, India
Mobile number: 91 9458609776
Email id: ujjawalsinghtomar@gmail.com

Murphy S. et al in his study found that there is a significant association between flexed postures and low back pain. Static posture and neck and upper back pain were also associated. In case of school children, schools are a part of environment and their environment, as they spend at least 5 hours daily in school, among these were the classroom furniture as well as school bags.⁵

Population based studies had demonstrated that the lifetime prevalence of musculoskeletal disorders in children and adolescents varies between 7 and 63% suggested that the spine and MSD should be considered as 3 distinct entities (the neck, upper back and low back pain). As thoracic pain is more common in younger children.⁶

But there is scant literature available in India regarding the musculoskeletal disorders among school children. Thus the aim of study was to find out the prevalence of MSD (Musculoskeletal disorder) in school going children and also to find out its association with BMI (Body Mass Index), number of sitting hours and weight of back packs.

METHOD

Study design - Cross sectional study

Study population was taken from Public School, Meerut. Approval to conduct the study was taken from the school principal. Students who were studying in class XI & XII were included in the study (n=195).

The study was done by means of Questionnaire which was drafted by guides & was checked for its comprehensibility. This Questionnaire consisted of three sections-

Section 1: Demographic information like name, age, gender, class, address and any relevant medical history, **Section 2-** It consisted of questions regarding number of sitting hours, weight of back pack & site of pain and **Section 3-** Consisted of measurement of height, weight & calculation of BMI (Body Mass Index).

DATA ANALYSIS

Data was analyzed using descriptive statistics.

RESULTS

Demographic characteristics are shown in table 1.

Table No.1 Demographic Details N = 195 students

Demographic Details	Percentage%
AGE(in yrs)	
14yrs	0.51%
15 yrs	6.67%
16 yrs	27.20%
17yrs	51.30%
18yrs	11.30%
19yrs	0.51%
NM	2.05%
GENDER	
MALE	66.60%
FEMALE	33.30%
CLASS	
XI	13.30%
XII	86.70%
HEIGHT(in ft)	
4 – 4.9"	4.10%
5 – 5.9"	91.80%
6 – 6.9"	4.10%
WEIGHT(in kgs)	
30 – 39	2.05%
40 – 49	35.40%
50 – 59	37.40%
60 – 69	19%
70 – 79	5.10%
80 – 89	1%

DEMOGRAPHIC DETAILS

AGE

Out of 195 subjects 0.51%(1) were 14 years of age, 6.67%(13) were 15 years of age, 27.2%(53) were 16 years of age, 51.3%(100) were 17 years of age, 11.3%(22) were of 18 years of age, .51%(1) were 19 years of age & those who not mentioned were 2.05%(4).

GENDER

66.6% (130) of subjects were male & 33.3% (65) of subjects were females.

CLASS

The students participated in the study were from class XI (13.3%, 26) & XII (86.7%, 169).

HEIGHT (in feet).

The students participated in the study were of different heights, 4.1% (8) were between 4ft - 4.9", 91.8% (179) were between 5ft-5.9" & 4.1%(8) were between 6ft-6.9".

WEIGHT (in kilograms)

2.05% (4) of students had body weight between 30-39kgs, 35.4% (73) of students had body weight between 40-49kgs, 37.4% (73) of students had body weight between 50-59kgs, 19% (37) of students had body weight between 60-69kgs, 5.1% (10) of students had body weight between 70-79kgs and 1% (2) of students had body weight between 80-89kgs (as seen in table 1).

POSTURAL PAIN

19.5% of students complained of postural pain. out of those students who complained of pain, 39.5% (15) complained of back pain, 34.2% (13) complained of neck pain & 26.3% (10) complained of pain in other areas. The students having no pain were 79% (154), and 15.4% (3) did not mention about pain, as depicted in table 2.

Table 2. Pain and its Relation with other factors

Postural Pain	Percentage (%)
Yes	19.50%
Back Pain	39.50%
Neck Pain	34.20%
Others	26.30%
No	79%
Nm (Not Mentioned)	15.40%
No. of Sitting Hours	
2- 4hrs	3.10%
4- 6hrs	62%
6- 8hrs	34.40%
>8hrs	1%
Weight of Back Pack	
1 - 5 Kg	63.60%
5 - 10 Kg	38.20%
>10 Kg	1.50%
Nm	6.70%
Body Mass Index(bmi)	
Underweight	47.20%
Normal	48.20%
Overweight	4.60%

NO. OF SITTING HOURS

Number of sitting hours was 2-4 hrs. for 3.1% (6) of students, 4-6hrs for 62% (120) of students, 6-8hrs for 34.4% (67) of students and more than 8hrs for 1% (02) of students, as depicted in table 2.

WEIGHT OF BACK PACK

63.6% (124) of students were carrying back pack

of 1-5kgs of weight, 28.2% (55) of students were carrying back-pack of 5-10kgs of weight, 1.5% (3) of students were carrying back pack of more than 10 kgs of weight and 6.7% (13) did not mention anything, as depicted in table 2.

BODY MASS INDEX (BMI)

47.2% (92) of students were underweight, 48.2% (94) of students had normal weight and 4.6% (9) of students were overweight (as seen in table.2)

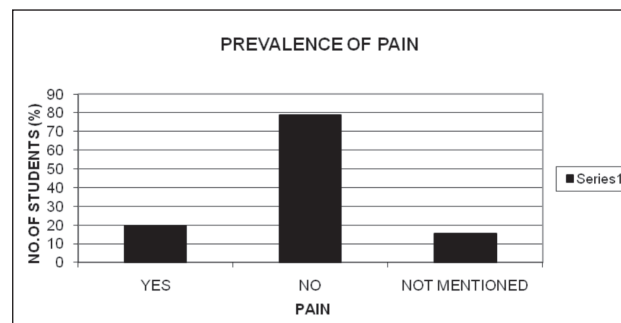
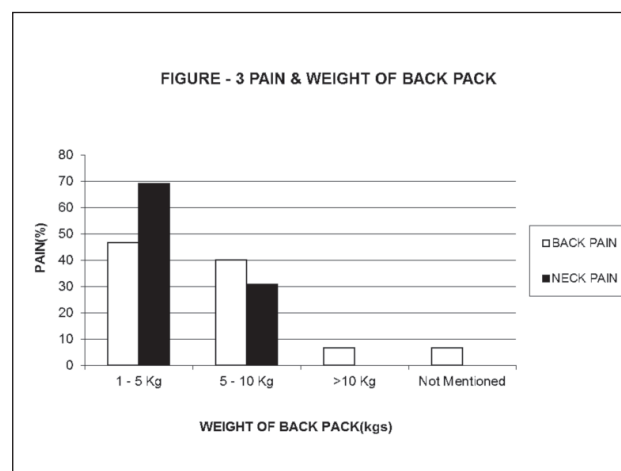
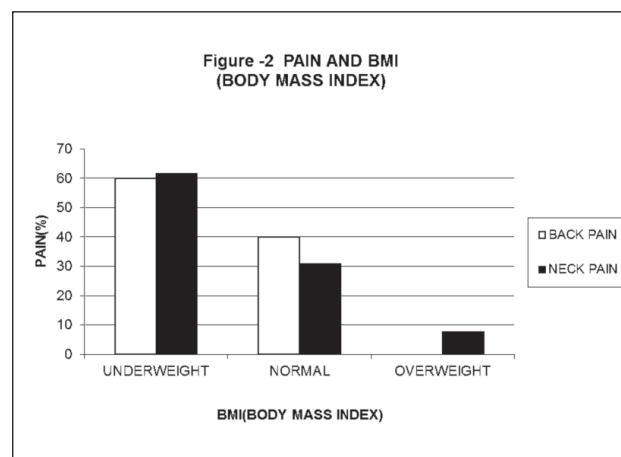
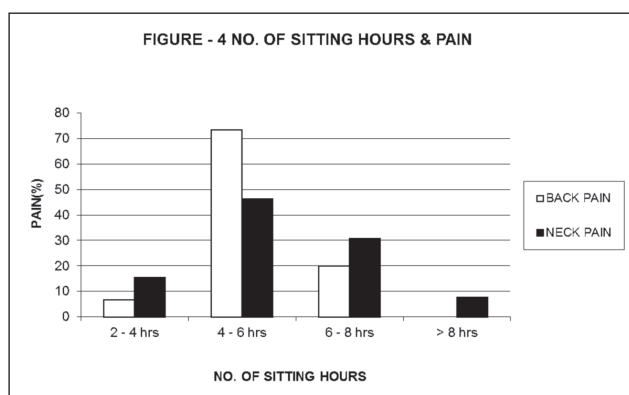


Fig. 1. Prevalence of postural pain among school going children





DISCUSSION

A Cross sectional study was conducted to find out the prevalence of musculoskeletal disorders among school going children in Meerut. A total of 195 subjects were surveyed using a questionnaire, 19.5 % of the students complained of pain. Out of which 39.5% students complained of back pain, 34.2% complained of neck pain and 26.3 % did not specify the site of pain. For the ease of understanding we will discuss under following headings

Back pain

Majority of students who complained of back pain were underweight (60%), they were sitting for 4 to 6 hours (73.3%) and they were carrying back pack of 1 to 5 kg (46.7%). Shyamal koley et al concluded in their study that backpack weight has some strong association with postural habits in the studied samples.³ Knight G.& noyes reported that high incidence of back pain significantly related to the frequency of non-standard sitting, they also suggested that children should be given more choice in their seating and better guidance should be given to individuals involved in education in order to inform their decision – making about classroom furniture and the postural anthropometric and orthopaedics aspects of sitting and related activities⁷ because it can also affect the posture of a school going children during the sitting hours but on the contrary Scoffer B in his study concluded that the different types of school furniture might not be the causative or preventive factor for LBP but the school bag in an asymmetric manner may play a role.⁸ supporting the same and explaining the physiology Korovesis et al in his study found that backpack carrying, particularly asymmetrically, results in shift of upper trunk and shoulder and cervical lordosis, which further more seem to increase back pain in school period and

holidays. Symmetric backpack carrying is recommended.⁹

Youlian Hong et al in his study concluded that there is no significant effect on gait pattern was found, and significant changes in trunk posture were observed only when the loads were increased from 15-20% of body weight. The effects of adaption of trunk posture under the experiment condition on musculoskeletal strain of the low back muscles need to be studied. It has been suggested that discomfort, pain, and musculoskeletal disorders can be reduced through the prevention of postural deviation. Caution should be raised when children carry backpack loads that exceed 15% body weight for their daily schooling.¹⁰

Neck pain

Majority of students who complained of neck pain were underweight (61.5%), they were sitting for 4 to 6 hours (46.2%) and they were carrying back pack of 1 to 5 kg (69.2%). Ash gee among the students who spent 5 or fewer hours using a computer each week, about 16% reported of neck pain, among students reporting 25 – 30 hrs of computer use a week, nearly 48% reported neck pain.¹¹

LIMITATION OF THE STUDY

Small sample size

Observation of class environment like furniture of class, sitting arrangement, distance from black board etc. was not done.

IMPLICATIONS FOR SCHOOL HEALTH

The mean weight of school bag should be within the recommended standards for load carried that is 10% of body weight as recommended by Saunder.¹⁰

Four main types of tables and chairs can be used as used at junior secondary schools in Vietnam. The first set includes a table for two with two single chairs attached. The second type is a double table with two separate single chair. The third is a table for two with a separate chair for two While the fourth type is the four seater table and chair set that has been used at schools for long time but is now being phased out schools across the nation mainly use the second and third type of furniture sets in classrooms. Some education experts say that double chairs are advantageous to learning, as students who have to

share seats will benefit in group based learning activities.¹¹

Prolong sitting can affect the posture of the school children so the length of the teaching lectures need to be monitored.

FUTURE STUDY

Large sample size should be taken for future studies.

We should incorporate the class environment in the study.

CONCLUSION

There is a prevalence of neck pain & back pain among school going children & postural pain was also related to weight of back pack, number of sitting hours & Body Mass Index (BMI).

APPROVAL STATEMENT

The study was approved by the research committee of the college as well as by the principal of the respective school.

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Definitive Antenatal Diagnosis of Tuberous Sclerosis in Fetus -A Case Report

Veerendrakumar CM¹, Suyajna D Joshi²

¹Associate Professor, Dept of Obstetrics & Gynecology, ²Professor and Unit Chief, Dept of Obstetrics & Gynecology, Vijayanagara institute of Medical Sciences, Bellary, Karnataka

ABSTRACT

Tuberous sclerosis (TSC) is a rare genetic disease that causes benign tumors to grow in the brain and on other vital organs. It commonly affects the central nervous system (CNS). In addition to the benign tumors that frequently occur in TSC, other common symptoms include seizures, mental retardation, behavioral problems and skin abnormalities. TSC may present at birth, but signs can be subtle and full symptoms may take some time to develop. Definitive antenatal diagnosis is very rare.

Keywords: Tuberous Sclerosis Complex, Bourneville Disease, Epiloia

INTRODUCTION

Mrs. BS a 24 yr old G3P1L1A1 (gravida 3 para 1 living 1 abortion 1) presented for antenatal care with 9 months of amenorrhea. Her general & physical examination findings were normal. Uterus was term size with single live fetus in longitudinal lie with cephalic presentation. Routine level II ultrasound examination revealed normal fetal biometry with presence of multiple focal hyper echoic cardiac lesions involving right ventricle & right atrium of the fetus (picture 1). Diagnostic consideration of rhabdomyoma of the heart was made. She was referred for level III fetal ultrasound. It showed borderline symmetric macrosomia, unilateral left lateral ventriculomegaly & fetal color duplex Doppler echocardiography revealed normal fetal chambers with normal function & showed the presence of a 1.7 X 1.1 cm hyper echoic, solid space occupying lesion in the apex of the right ventricle. Possibility of tuberous sclerosis was considered with these findings. Fetal / neonatal magnetic resonance imaging (MRI) was suggested. After taking informed consent from the patient & relatives fetal brain MRI was done. Multiple different sized circumscribed discoid areas of hypo intensities were noted outlining the lateral

ventricles & projected into them from their lateral ependymal silhouettes (picture 3&4). A solitary focal lesion across the left fronto parietal sub cortical region was also noted. The cerebrum was otherwise normal. Final diagnosis of Tuberous sclerosis was made based on the USG & MRI findings. Mrs. BS underwent emergency Lower segment cesarean section (LSCS) for cephalo pelvic disproportion (CPD). A live term male weighing 3.5 kg was extracted on 14/11/06 (picture 2). Baby cried well after birth. Baby was seen both by pediatric cardiologist & neurosurgeon who advised regular follow up of the baby. Baby was doing fine till 9 months with normal milestones. Baby developed generalized tonic clonic seizures at 10 months. MRI brain was done which showed the same findings as that of antenatal MRI of fetal brain. Baby died at the age of 13 months.

Corresponding author:

Veerendrakumar CM

Associate Professor

Obstetrics & Gynecology

Vijayanagara institute of medical sciences (VIMS)

Bellary 583104 Karnataka

veerendrakumarc@gmail.com,

Mob. 09886275656, Fax -08392-275730



Fig. 1. USG showing rhabdomyoma in the apex of Rt ventricle



Fig. 2. New born fetus without any cutaneous TSC stigmata



Fig. 3. MRI fetal brain showing subependymal nodules

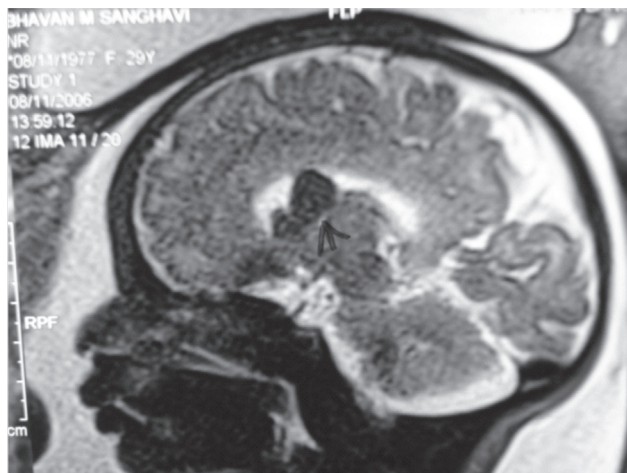


Fig. 4. Sagittal fetal MRI brain showing lateral ventriculomegaly with nodules

DISCUSSION

Tuberous sclerosis is a genetic disorder with an autosomal dominant pattern of inheritance, and penetrance is variable. A 1998 study estimated total population prevalence between about 7 and 12 cases per 100,000. More than half of these cases go undetected.¹ So far it has been mapped to two genetic loci, TSC1 and TSC2. TSC1 encodes for the protein hamartin located on chromosome 9q34 and was discovered in 1997.² TSC2 encoding for the protein tuberlin is located on chromosome 16p13.3 and was discovered in 1993.³ TSC2 has been associated with a more severe form of TSC.⁴ It affects cellular differentiation and proliferation, which results in hamartoma formation in many organs (eg, brain, skin, eye, kidney, heart). Von Recklinghausen first described tuberous sclerosis in 1862. Bourneville coined the term *sclerose tuberuse*. It commonly affects the CNS. In addition to frequently occurring benign tumors, other common symptoms include seizures, mental retardation, behavior problems and skin abnormalities. The term tuberous sclerosis complex (TSC) is now widely used, emphasizing the variegated nature of its manifestations. TSC may be present at birth, but signs of the disorder can be subtle & full symptoms may take some time to develop. Some individuals are severely affected & some have very few features. No racial & sex predilection has been noted. Most patients are diagnosed between 2 & 6 years of age. Most individuals present with parental concern about small raised tumors on the child's face.

The criteria for diagnosing TSC have recently been revised. Diagnostic Criteria for Tuberous Sclerosis Complex⁵ - Major features are facial angiofibroma, non traumatic ungula/periungual fibromas, hypomelanotic macules, shagreen patch, multiple retinal nodular hamartoma, cortical tubers, subependymal nodule, giant cell astrocytoma, cardiac rhabdomyoma, lymphangiomyomatosis & renal angiomyolipoma. Minor features are multiple randomly distributed pits in dental enamel, hamartomatous rectal polyps, bone cysts, cerebral white matter radial migration lines, gingival fibromas, non renal hamartoma, retinal achromic patch, confetti skin lesions & multiple renal cysts. The definite TSC is diagnosed by the presence of 2 major features or 1 major plus 2 minor features. Preimplantation diagnosis is not widely available.

There is no cure for TSC. Treatment is mainly symptomatic. The prognosis for individuals with TSC

depends on the severity of symptoms, which range from mild skin abnormalities to varying degrees of learning disabilities and epilepsy to severe mental retardation, uncontrollable seizures, and kidney failure. However, with appropriate medical care, most individuals with the disorder can look forward to normal life expectancy.⁶ In 2002, treatment with rapamycin was found to be effective at shrinking tumours in animals. This has led to human trials of rapamycin as a drug to treat several of the tumors associated with Tuberous Sclerosis. It has shown to decrease the size of astrocytomas associated with TSC⁷. It is hoped current research will improve the genetic test for TSC and lead to new avenues of treatment, methods of prevention, and ultimately, a cure. This case is reported as Tuberous Sclerosis Complex is rare & very rarely definitive antenatal diagnosis of TSC is made.

We acknowledge the help of our resident Dr. Ravikumar in preparing this case report. There is no conflict of interest and no funding is involved in preparation of this case report. Ethical clearance has been obtained.

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Improving Cause of Death Information for Infant Deaths by Application of Verbal Autopsy Tool in India

Vijay Kumar¹, B S Garg²

¹Associate Professor, Department of Community Medicine, Dr. SMCSI Medical College & Hospital Karakonam, Kerala, ²Professor & Dean, Department of Community Medicine, Mahatma Gandhi Institute of Medical Sciences, Sewagram, Maharashtra

ABSTRACT

Objective: To see the usefulness of verbal autopsy and in assessing the cause of deaths among infants and identify gaps in reporting system in 4 PHCs in India.

Methodology: The study incorporated all the infant deaths, which occurred in a one-year period from 2nd Jan 2004 to 1st Jan 2005 in Yavatmal district (rural India). This data was compared with the corresponding district data and the gaps in reporting were identified site-wise.

Results: Among the 4 health centers under reporting was more than 50% in 2 health centers. The IMR was found to be 59 per 1000 live births in contrast to 38 per 1000, given by the district authorities. Medical certification of cause of death was done in only 12% of deaths. Of all the 90 infant deaths studied, majority (73%) were delivered at home and were attended by unskilled personnel (72%). There were 63% deaths which occurred in the early neonatal period, 13% in late neonatal period and 23% in post neonatal period. In early neonatal period 47% were contributed by both Prematurity and LBW. In post neonatal period mostly infectious causes like ARI contributed for 35% followed by CNS infections (12%).

Conclusions: It was seen that the verbal autopsy can be used for two purposes. Firstly, it can help to give information for the health planners to prioritize health services based on the mortality pattern of an area. Secondly the VA can be used for collecting information for action at the local level.

Keywords: Infant Mortality, Low Birth Weight, Neonatal Period, Prematurity, Verbal Autopsy

INTRODUCTION

Information on causes of death is extremely important for policy-making, planning, monitoring and evaluation of health programmes, as well as being necessary for field research, comparisons and epidemic awareness. In developing countries, where most deaths are neither attended by doctors nor medically certified, this crucial information is often incomplete and of poor quality. Since this situation is not likely to change in the near future, there is an urgent need to search for alternative methods of obtaining information on causes of deaths. This is particularly important for childhood deaths, which constitute a major portion of all deaths, and which many intervention programmes are currently attempting to reduce¹.

Specific targets for reducing the infant mortality rate (IMR) have been set by many governments and international organizations. The Millennium Development Goal is to reduce infant mortality rate to

35 per 1000 and under-five mortality to 45 per 1000 live births by 2015². The goal of National Health Policy-2002 is to reduce IMR to 30 per 1000 live births by 2010³ and the Tenth Plan goal is to reduce IMR to 45 per 1000 live births by 2007 and to 28 per 1000 live births by 2012.⁴ Since 1996, India's IMR has stagnated at 72, which is far above the "Health For All" goal set by the government of India of an IMR of 60 per 1000 live births by the year 2000⁵. India faces considerable challenge in the vital registration and cause of death (COD) reporting. Overall, about one in two of all births and deaths are registered in India. More reliable medically certified cause of death is available in only about one in 30 of all deaths⁶.

MATERIALS AND METHOD

The verbal autopsy technique, which involves questioning the family of a dead infant about the features of the child's final illness provides a means of obtaining information on the cause of death.

We set up a verbal autopsy system in the study areas of 4 health centers where the deaths occurring at the village level are identified by the Anganwadi workers (Dept. of women and child development). They will inform the infant deaths to the Auxiliary nurse midwife (Dept of health & family welfare) who conducts the verbal autopsy and then the deaths will be discussed in detail during the monthly meetings along with the Medical officer and the research investigator. The study was a prospective, observational study, combining both the qualitative and quantitative methods undertaken to find out the causes of infant deaths and to study the feasibility of infant mortality audit at the PHC level.

Duration and Study Site: The study was undertaken in four PHC areas of Dhanora, Waradh, Dahegaon and Mardi of Yavatmal District in 2005. The populations catered to by these PHCs were 22,449, 21,259, 28,530 and 25,494 respectively.

STUDY SUBJECTS

The study incorporated all the infant deaths, which occurred in a one-year period from 2nd Jan 2004 to 1st Jan 2005. This data was compared with the corresponding district data which was available in 2005 and the gaps in reporting were identified site-wise.

The cases eligible for inclusion were those which

1. Qualified to be classified as infant death according to WHO ICD – 10 classification
2. The deaths must have occurred within the above-mentioned four PHC areas.
3. All the deaths occurred in any health facility (hospital, health center or dispensary), in the community or en route to a health facility.
4. The deaths must have occurred between the above mentioned period

Exclusion criteria used were:

1. Still births were excluded.
2. Deaths of infant not resident of the study area.

The study was conducted in 3 phases which are listed below

Phase I – Includes Consent of appropriate authorities, development of verbal autopsy questionnaire and piloting.

Phase II - Training of Anganwadi workers for case identification and reporting and training of ANMs in the art of conducting verbal autopsy

Phase III -Investigation of the Infant deaths using verbal autopsy, ensuring Quality assurance, checking the Operational feasibility and finally analysis and report writing.

CONSENT OF APPROPRIATE AUTHORITIES

Permission was obtained well in advance prior to the beginning of the study from the appropriate district authorities to train the ANMs at DTO (District Training Office) and to attend the monthly meetings at PHCs. Co-operation with the ICDS and District Health System was ensured. Individual informed consent was taken from the respondents prior to interview.

DEVELOPMENT OF VERBAL AUTOPSY QUESTIONNAIRE

Suitable verbal autopsy questionnaire was developed for the Auxiliary Nurse Midwife and LHV (Lady Health Visitor) with the help of standard verbal autopsy by WHO (WHO 1996), the Verbal Autopsy Method and Criteria developed by SEARCH (Hill 1992), Gadchiroli, the Verbal Autopsy Questionnaire used in the SRS (Hill 1999) and the verbal autopsy from the Primary Health Care Management Advancement Programme (PHC MAP) published by Aga Khan Foundation

RESULTS

It was observed that from four health centers in the district, there was underreporting of 17 infant deaths during the year 2003-04. Among the 4 health centers it was found that the under reporting was more than 50% in Dhanora and Dahegaon. The reported IMR for these PHCs are 19 and 25 per 1000 live births respectively but it was found to be 39 and 59 per 1000 live births from the study there by leading to different IMR values from various sources as documented in Table 1 below.

Table 1 Disparities of infant deaths reporting among the 4 PHCs

Name of PHC	Live births	Infant Deaths				Difference	
		MOH data		Study data			
		No	IMR	No	IMR	No	IMR
Dhanora	463	9	19	18	39	9	20
Waradh	328	19	58	23	70	4	12
Dahegaon	322	8	25	19	59	11	24
Mardi	406	27	66	30	74	3	8
TOTAL	1519	63	41	90	59	17	18

Out of the total of 90 deaths, 59 (65.6%) were males while 31 (34.4%) were females.

More than three-fourths of the infant deaths 74, (82.2%) were not medically certified

Out of the total 90 deaths investigated, where age at death was recorded, 57 (63.3%) were early neonatal deaths (0-7 days), 12 (13.3%) were late neonatal deaths (8-28 days) and 21 (23.3%) deaths occurred in the post neonatal period as shown in table 2 below.

Table 2 Distribution of Infant deaths according to age from various sources

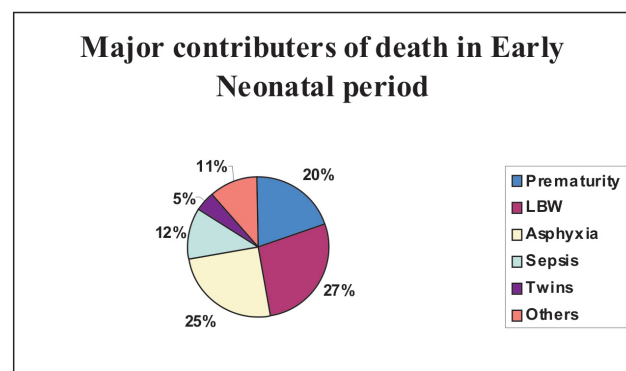
Age	District level (N=1462)			MIS from 4 PHCs (N= 63)			Verbal autopsy (N=90)		
	No	%	Rate	No	%	Rate	No	%	Rate
0-7 days	746	51	22	42	67	28	57	63	38
8-28 days	351	24	10	9	14	6	12	13	8
0-28 days	1097	75	32	51	81	34	69	77	45
28 days- 1 yr	365	25	11	12	19	8	21	23	14

Among the total infant deaths investigated, in 66 (73.3%) cases delivery took place at home. In 23 (25.6%) cases, deliveries were institutional. In 1 (1.1%) case delivery took place during transport.

Among the 90 infant deaths, 57 occurred in the early neonatal period and nearly half of the deaths i.e. 47% were contributed by both Prematurity and LBW followed by Asphyxia with 25% which shows the lack of skilled person during delivery as shown below in Fig 2.

especially acute respiratory infections with 35% followed by CNS infections (12%). LBW contributes to another 20% of the deaths that occurred in post natal period.

It is seen that the deaths due to LBW and Prematurity contributed to 75% of all deaths in the study, whereas it was only around 49% as per the district data. Even though asphyxia contributed to 34%, of the cases, it was under reported as only 10% by management information system of health system.

**Figure 2 Major contributors of death in early neonatal period**

As depicted below in Fig 3 in contrast to the early neonatal period, in post neonatal period the majority of deaths were contributed mainly by the infectious causes

DISCUSSION

Infant mortality rate (IMR) is considered as one of the most sensitive indicators of health status and development of a community⁵. Each year, a total of 25 million infants are born in India and at the present neonatal mortality rate of 45 per 1000 live-births.⁶ The objective of RCH – II Programme and the Tenth Plan is to decrease the prevailing IMR to 45/1000 by 2007 and 28/1000 live births by 2012⁷.

The choice of Respondent is crucial for the accuracy of information. In the LSHTM workshop⁸, it was suggested that the interviewer should ask which members from the household were present at the time of death, were close to the deceased and are available

for the interview. In the present study, out of the 90 infant deaths investigated, in the majority of deaths (66, 73.3%) the mother was the respondent while the father was the respondent in 18 (20.0%) deaths. The same is also supported by the findings of a previous study by Kalter et al, 1990⁹ involving verbal autopsy. Though their methodology was quite different, Garrene and Fontaine, 1990¹⁰ also found that mothers could provide accurate diagnostic information upto one year after the death of the child. In a review of 35 studies, which had used verbal autopsy for assigning causes of death, Chandramohan et al, 1994¹¹ concluded that mothers are the principal respondents for childhood deaths.

In case of the 57 (63.3%) early neonatal deaths, 41 (72%) were males and 16 (28.1%) were females. Out of the 12 (13.3%) late neonatal deaths, 7 (58.4%) were males whereas 5 (41.6%) were females. In the remaining 21 (23.3%) post neonatal deaths, 12 (57.1%) deaths were males while 9 (42.9%) were females. But when the total mortality rate is split into neonatal and post neonatal deaths, the picture gets reversed, i.e. neonatal death rate is higher for males than for females while post neonatal death rate is higher for female infants than male infants¹². The reverse findings in the study area could be attributed to the fact that gender bias is not yet as severe a problem as in the other parts of the country as depicted by the relatively better sex ratio of Maharashtra State (933 females per 1000 males)¹³.

Out of the 90 deaths investigated, more than half of the infant deaths (69, 76.7%) occurred at home. There are 10 (11%) deaths occurred at private health facilities while 9 (10%) deaths occurred at government health facilities and 2 (2.2%) deaths occurred during transport. This is consistent with the findings of previous studies in rural areas which have demonstrated the unwillingness of parents to move ill infants from home because of traditional beliefs and practical difficulties⁽¹⁴⁻¹⁶⁾ due to which most of the neonatal deaths occur at home.

Out of the 90 deaths investigated, more than three-fourths of the infant deaths (74, 82.2%) were not medically certified. This is consistent with the reported low levels of medical certification in the country.⁽¹⁷⁾ The low levels of medical certification along with the low registration of childhood deaths in Maharashtra (28.2% in age group 0 – 4 years) and other states in India⁽¹⁸⁾ results in the total lack of good quality data on infant deaths.

The encouraging aspect of the study was the

identification of Low Birth Weight (LBW) and Neonatal Sepsis as important causes of neonatal and infant deaths. LBW was identified as a cause of death in 47.77% of infant deaths and 52.17% of neonatal deaths. This is in concordance with the high incidence of low birth weight reported in developing countries like India (26% of all live births).⁽²²⁾

Neonatal sepsis was identified as a cause of death in 26.08% of neonatal deaths. This was consistent with the findings from various studies in India, which have shown that Neonatal sepsis is responsible for 20-27.5% of neonatal deaths.⁽²³⁻²⁵⁾ The algorithm used in the present study was adopted from the verbal autopsy questionnaire used at SEARCH, Gadchiroli⁽²⁶⁾

In the light of the above, it is clear that verbal autopsy conducted by ANMs can serve as a viable alternative to improve the infant mortality data. The level of education of the ANMs is similar to the level of education of lay reporters who have conducted verbal autopsy in various studies. A study in Chandigarh⁽¹⁹⁾ trained field assistants (PHC worker equivalent) with high school education to investigate infant deaths using verbal autopsy technique. In the study by Kalter et al. 1990,⁽²⁰⁾ mothers were interviewed by professional interviewers who were Filipino women with undergraduate college degrees. For studies involved in verbal autopsies of adult deaths, workers with higher levels of education were used. Chandramohan et al. 1998⁽²¹⁾ utilized interviewers with at least 12 years of formal education. In the present study, the ANMs conducted the verbal autopsy and also assigned the causes of death, which were later reviewed by the PHC Medical Officer.

RECOMMENDATIONS

Inter sectoral Collaboration for the complete reporting of infant deaths in MIS. In spite of the civil registration system, the health and family welfare department must record all births and deaths. The functionaries of the department should be encouraged to make complete reporting.

Accountability for under-reporting of deaths must be established in the Health and Family Welfare department at every level. Establishing a channel between the workers of Dept of women and child development i.e. the Anganwadi workers and the ANMs of Health and Family welfare, which was done in this study would be a better alternative not to miss the cases from the community.

Improving the factors contributing to infant deaths

Strengthening of First line health services

To provide a good infrastructure and the necessary equipment at the health centers like the resuscitation kit, delivery kits etc to promote safe deliveries and prevent the asphyxial deaths.

Human resources

Most of the sub centers and primary health centers are over burdened with work and they are understaffed. Good perinatal care will be achieved only if these centers are staffed optimally so as to continue the services to the target population especially pregnant women and infants.

Capacity building

Capacity building of staff members at the primary and secondary referral levels by providing skills and knowledge regarding the risk concept and appropriate technologies to promote and expand principles and methodology of IMCI.

Health Education

Provide health education to families, monitor the neonates for high risk or sicknesses and improve the health seeking behaviour, and increase utilization of health facilities.

Community Participation:

The aim is

- i) To organize village referral teams with the involvement of community members.
- ii) To establish community funds to pay for emergency referrals.
- iii) To identify a means of transport in each community that could be made available in an emergency.

Strengthening of Referral Services

Strengthening of health facilities by provision of essential medicines, equipment, vaccines and also improving maternal records for pregnancy, delivery and newborn care.

Regular supervisory visits of the referral level staff members (e.g. Medical Officer of PHC, Lady Health Visitor) will support the TBAs, ANMs and mothers in caring for the newborns at home to provide adequate qualified medical care (quality, accessibility & guarantee) for all population groups.

CONCLUSIONS

It was seen that the verbal autopsy can be used for two purposes. Firstly, it can, help to give information for the health planners to prioritize health services based on the mortality pattern of an area. Secondly, health workers can also get a feedback of the information that they have collected; and not merely a meaningless piece of information that they collect and forget. In other words, the VA can be used for collecting information for action at the local level.

The results of this exercise were also shared with the workers. However, as was noted in the study, there was a problem of not getting the records of the infant deaths data. This is a usual problem faced in any routine activity. This can be improved only if the health workers realize that finding about the causes of death in their own area is going to help them in providing better health care. We also noted during the group discussions in monthly meetings the need for regular training of the workers, emphasizing the need to fill the verbal autopsy forms properly, get accurate information thus making it easier to arrive at a definite cause of death.

The results suggest that there should be a shift in child survival programmes to give greater emphasis to maternal and neonatal health, in particular to safe delivery and cord care.

In conclusion, the use of the verbal autopsy tool by health workers to find out the cause of death is feasible. It can also provide information for local action by health authorities to reduce the infant mortality rate, according to area-specific causes of death.

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Ethical clearance: The study got ethical clearance from the College Ethical Board and all the participants were included only after their consent to participate in this research as mentioned in methodology section.

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Tuberculosis an Important Global Health Issue in this Era -A Cross Sectional Study of Epidemiology of TB among South Asian Workers in Saudi Arabia

Vijay Kumar Chattu¹, A Mohammad²

¹(PhD) Researcher- Global Health Governance, Department of Public Health, College of Health Sciences, University of Buraimi, Al Buraimi, Oman, ²Associate Professor, Department of Medical Laboratories, College of Applied Medical Sciences, Qassim University, Buraidah, Saudi Arabia

ABSTRACT

Objective: A cross sectional study was carried out to assess prevalence of tuberculosis among migrant worker in Qassim region, Saudi Arabia.

Methods: Retrospective study based on the secondary data pertaining to the patients registered in hospital from Jan 2005 to December 2009. A total of 165 migrant form neighboring countries were included.

Results: The majority of subjects (72, 44%) were from Indonesia, India with (38, 21%) cases followed by Nepal (12, 7%). Out of 165 patients, 95 (58%) were female compared to 70 (42%) males with housemaid being the highest (45.5%) with regard to occupational category. Majority of the cases were of middle age and low socio economic status. Fever, loss of appetite, loss of weight, and cough were the chief clinical presentations. Among the total cases, 9 cases (6%) were suffering from Diabetes.

Conclusion: Prevalence of TB among migrant is relatively high. Preventive measures for early diagnosis should be performed especially in migrant worker from high-prevalence countries.

Keywords: Prevalence, Tuberculosis, Migrant, Buraidah, Cross Sectional Study

INTRODUCTION

Tuberculosis (TB) is an ancient disease that has affected mankind for more than 4,000 years. It is a chronic disease caused by the bacillus *Mycobacterium tuberculosis* and spreads from person to person through air. TB usually affects the lungs but it can also affect other parts of the body, such as brain, intestines, kidneys, or the spine. Although a declining trend was observed in most developed countries, this was not evident in many developing countries. Global health is now considered important for national and international security, domestic and global economic well-being.

Tuberculosis has troubled humankind throughout history. It is estimated that almost a third of the world's population is infected with *M. tuberculosis*, causing roughly more than two million deaths annually [1]. *M. tuberculosis* is known to be the leading cause of death due to a single infectious species [2,3,4]. The worldwide annual incidence continues to increase in Africa with

85% new cases because of the HIV epidemic, whereas it is stable or falling in all other regions [5]. Although the majority of infected individuals don't exhibit overt signs of disease, they represent a large pool of infection that allows for new cases to arise and have a risk of reactivation at a later time in their lives [6]. The risk increases significantly when the immune system of infected individual becomes suppressed, such as individuals infected with human immune deficiency virus HIV [7,8].

In Saudi Arabia the total number of cases of tuberculosis (TB) in 2006 (pulmonary and extra-pulmonary) was 3646. The incidence rate was 15.4/100,000, with an increase of 0.53/100,000 in comparison with the same rate recorded in the previous year. Cases of pulmonary TB constituted 70.6% while the extra-pulmonary TB cases constituted 29.4% of the total cases in this year [10]. In addition, Saudi Arabia in general with its developmental projects is known to attract a lot of international work force from Asian and African countries where

infections might be dominant. Therefore, this study was carried out aiming to determine epidemiological and clinical characteristics of TB cases among migrant worker in Qassim region, Saudi Arabia between January 2005 and December 2009.

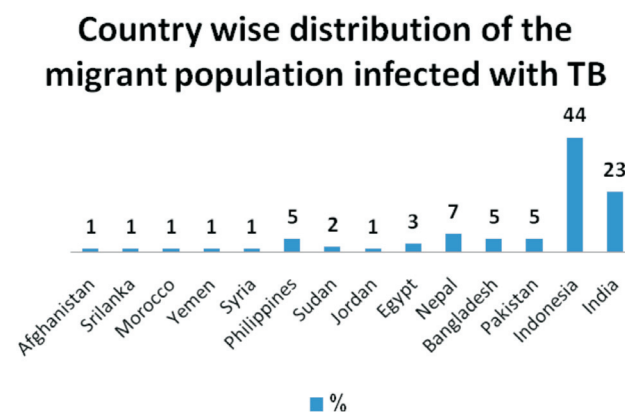
MATERIALS AND METHOD

This study was conducted in a regional TB center in Qassim region that lies approximately at the centre of the Arabian Peninsula. It was conducted as a retrospective study based on the secondary data pertaining to the patients registered in hospital from Jan 2005 to December 2009. A total of 165 patients registered at the hospital were included in the study. Patients' case sheets were used as source of data. Findings were cross-checked with TB-Lab register, TB register, and TB cards of patients. Apart from demographic profile of the patients, the presenting symptoms, co-morbid conditions, diagnostic methods used and treatment regimen were also assessed. The study was approved by the Ethics and Research Committee of Qassim University. Data collected is entered and analyzed using Epi_info software.

RESULTS

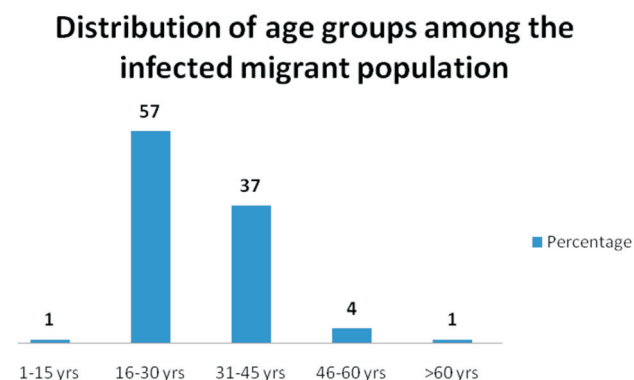
The study comprised of all the migrants population with confirmed TB registered during 2005-09. There were a total of 165 migrant attracted to Qassim various developmental projects from the neighboring countries mainly from South East Asia accessing the TB services at Regional TB center at Qassim. Out of the total 165 migrant patients, the majority 72 (44%) of the patients registered were from Indonesia, India with 38 (21%) cases followed by Nepal 12 (7%), Philippines 9 (5.5%), Bangladesh 9 (5.5%) and Pakistan 8 (5%). The remaining patients were from other countries like Sudan, Egypt, Jordan, Srilanka, Syria, Afghanistan and Morocco as shown below.

Figure 1:



There were more female patients 95 (58%) compared to males 70 (42%) among the total 165 cases diagnosed with either pulmonary or extra pulmonary cases of TB. The majority of subjects 94 (57%) were in the age group of 16-30 yrs followed by 61 cases (37%) in the age group of 31-45 years indicating 94% of cases under 45 yrs of age as shown below in Fig 2.

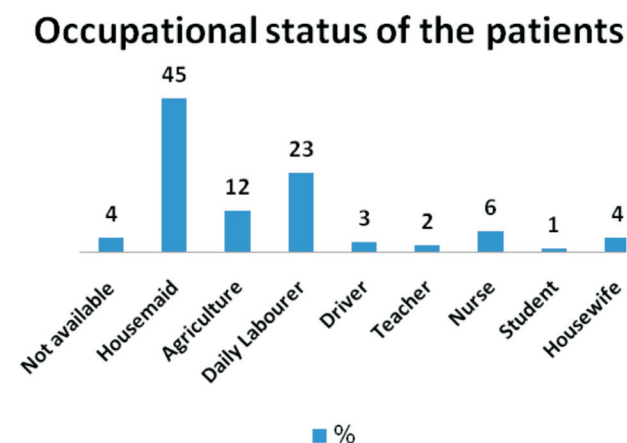
Figure 2:



A total of 125 (76%) patients were married while only 40 cases (24%) were unmarried or with single status.

Out of 165 cases included in the study the details about occupation were studied and distribution of the occupational categories is shown in the chart below. It was observed that housemaids category were 75 (45.5%), daily laborers contributed to 38 (23%) cases followed by people involved in agricultural work with 20 cases (12%) as expressed in figure 3.

Figure 3:



Patients with both pulmonary and extra pulmonary TB had various clinical presentations but they had complaints similar to the typical TB case presentation. The majority 132 (80%) were admitted with Fever, 122 cases (74%) had Loss of appetite, 119 patients (72 %) had loss of weight, 91 (55.2%) complaining of cough with expectoration and 61 (37 %) were presenting with chest pain as shown in Table 1.

Table 1: Distribution of patients by presenting complaints

Presenting complaint	Number (%)
Fever	132 (80)
Loss of Appetite	122 (74)
Loss of weight	119 (72)
Cough	99 (60)
Night sweats	98 (60)
Chest pain	61 (37)
Lymph node involvement	37 (22)

It was observed that in few patients there were other co-morbid conditions associated like Diabetes mellitus in 9 (6%) cases, 2 patients (1.2 %) were also suffering from chronic lung disease and 2 cases (1.2%) on immunosuppressive therapy.

For the purpose of diagnosis, sputum microscopy, CXR, Tuberculin test and FNAC (those with LN involvement) were conducted on patients. It was observed that out of 91 cases (55%) who had sputum, 68 (75%) patients were sputum positive for AFB. The CXR examination was done for all patients and it showed positive signs on 101 (61.2%) of cases. Out of total 165 Tuberculin skin tests 134 (81.2%) showed the positive reaction.

Of the total 165 TB cases, 160 (97%) were new cases and 4 (2.4%) were relapse cases and one default case. The majority of them 84 (51%) cases are extra pulmonary and 78 (47%) were pulmonary cases followed by 3 (1.8%) cases with both pulmonary and extra-pulmonary involvement.

All the cases were treated with DOTS regimen. Of the 165 patients, 80 (48.6%) patients were put under CAT I, 2 cases (1.2%) on CAT II, and 84 cases (50.2%) on CAT III as shown below in Table 2.

Table 2: Distribution of TB patients as per the DOTS regimen

DOTS Regimen	Number (%)
CAT I	80 (48.6)
CAT II	2 (1.2)
CAT III	83 (50.2)

DISCUSSION

Previous studies have indicated that importation of TB cases from other communities is part of the TB burden ^[11] where migration from countries endemic for TB account for a significant proportion of tuberculosis cases in some countries ^[12,13]. Immigrants usually develop active TB mainly as the result of reactivation of latent infection yet increased incidence of primary TB has also been reported ^[14] However, only limited number of studies addressing this issue with regard to tuberculosis in migrant worker in Saudi Arabia. The impact of this concept can be seen clearly in Saudi Arabia where African and Asian mycobacterial variants were isolated from Saudi and non-Saudi patients ^[15]. Thus the national guidelines recommend screening recent immigrants from countries with a high TB prevalence for better border control ^[16].

Tuberculosis is very highly infectious disease particularly when the smear positive for Acid fast bacilli ^[17]. According to data presented in this study, almost half of the TB cases in Qassim regional TB center are non Saudi indicating the important role they could play in spreading TB infection. The majority of subjects tested in this study were from Indonesia followed by India and Nepal. It is thus valuable to screen this high risk population in order to identify latent infection with TB which pose a threat to the receiving communities.

Tuberculosis is still a disease of economically productive age group among the low socio-economic strata of the society. About (94%) of TB patients belonged to the age group of 16-45 years. Similar results were reported previously in a study conducted in Jammu & Kashmir, majority (76%) of the in patients were in middle age ^[16]. All patients attend the TB center with TB chief clinical presentations including fever, loss of appetite, loss of weight, and cough with expectoration. WHO-DOTS regimen remains the standard of treatment of TB cases with 100% of cases treated according to the WHO-DOTS regimen for the diagnosis and treatment. Findings of this study revealed an important facts that sputum microscopy which is cost effective proved to be a successful tool for the diagnosis where it showed a positive rate of 75% among those with productive sputum.

In summery, findings of this study confirmed that prevalence of TB among migrant is relatively high which contribute to the prevalence of TB mainly those coming from South East Asian countries. This study suggests that preventive measures for early diagnosis should be incorporated in the migration process particularly persons from countries endemic for TB for better control.

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Conflict of Interest: The Authors declare that there is no conflict of interest

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Ethical Clearance: The study got ethical clearance from the Ethics & Research Committee of Qassim University.

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Challenges of Tuberculosis Control through Private Practitioners

Vinay Garg¹, J K Das², Manish Chaturvedi³

¹Assistant Professor, Department of Community Medicine, Sharda Hospital, SMS & R, Greater Noida, ²Professor, Department Medical Care & Hospital Administration, NIHFV, Munirka, New Delhi, ³Associate Professor, Department of Community Medicine, Sharda Hospital, SMS & R, Greater Noida, Uttar Pradesh

ABSTRACT

Setting: Privately practicing doctors trained in modern system of medicine in East Delhi area

Objective: To ascertain the practices pertaining to diagnosis and treatment of tuberculosis & utilization of RNTCP by private practitioners

Method: Quantitative data were obtained using a semi-structured interview schedule administered to 102 private practitioners trained in modern system of medicine, while qualitative data were obtained from key informant interviews (government functionaries) that focused on experiences regarding PPP in RNTCP.

Results: Data reveal that patients are started on ATT without baseline laboratory confirmations, record keeping is scanty & lack of trust in government run PPP schemes

Conclusion: To improve private participation, network of accredited TB laboratory laboratories is needed along with bi directional treatment referrals.

Keywords: *Tuberculosis, Private Public Partnership (Ppp)*

INTRODUCTION

Since the discovery of Mycobacterium Bacillus in March 1882 by Dr. Robert Koch in Germany, Tuberculosis has remained as the oldest and the most widespread killer disease of mankind. Worldwide, more people die of tuberculosis than any other curable infectious disease. Every day, more than 20,000 people develop active TB, and 5000 die of it. One-third of the world's population is infected with tuberculosis bacillus. Untreated, a person with active TB can infect 10-15 people a year on average. Eight to nine million new cases of tuberculosis occur in the world each year and nearly two million deaths due to this disease.

TB control programme in India

In 1943 the central government appointed a health survey and development committee ("Bhore committee") to review the country's health problems and recommend measures for their management. The recommendation for tuberculosis control consisted of establishing 100000 tuberculosis beds (1 bed for every 5 deaths), one main TB clinic at district headquarters town, and sub clinics at taluq towns, one mobile clinic per district. BCG

vaccination was accepted by the Planning commission for prevention of TB and was started in 1951 with WHO assistance. The National Tuberculosis Control Programme was started in 1962 with the aim to detect cases earliest and to treat them. A study from the Tuberculosis Research Centre (TRC), Chennai, India, states that more than 50% of individuals with chest symptoms approach

Private practitioners for diagnosis treatment of tuberculosis as per The Directorate Of Health Services , Government of India ,it is estimated that almost an equal number of TB cases i.e. about 1.1 million, report to the physicians practicing in private sector ². Public sector care is free in India, yet three quarters of India's medical expenditure takes place in the private sector ²

The RNTCP was formally launched in 1997, following a pilot test phase from 1993-96, and by March 2006 the entire country was covered under the programme.

The market for private patients is lucrative and most general practitioners are in private practice. The high use of the private sector is partly due to the

inaccessibility of public services, but in urban areas, it might be because of perceptions of greater privacy, speed of service, and quality of diagnosis, prescribing and doctor behaviour. The high use of the private sector is partly due to the inaccessibility of public services, but in urban areas, it might be because of perceptions of greater privacy, speed of service, and quality of diagnosis, prescribing and doctor behaviour. The profits to be made from out-of-pocket payment for primary care services are encouraging the formation of private companies aiming to compete with general practices by running clinics with higher standards of patient care at a comparable charge. Patients attending these clinics have to pay a fee per visit for drugs, laboratory tests, and X-rays until they are covered by any medical insurance schemes. The private practitioner is the first contact window for health services to majority of patients ^{3,4} & so the complete and whole hearted voluntary participation by such doctors becomes imperative.

MATERIAL AND METHOD

The directory of doctors (5th edition) published by East Delhi Branch of IMA (Indian Medical Association) was used to obtain the list of doctors practicing in East Delhi Area. The sample was drawn using systematic random sampling technique. Data was collected from the short listed practitioners (by way of sampling) using a semi structured interview schedule. The doctors listed in the latest directory of Indian Medical Association (5th Edition) were considered. Only those private doctors who were actually treating the cases of pulmonary tuberculosis were included in the study. The data was collected from the month of October 2004 to February 2005 and analyzed using the SPSS 10.5. An analysis of the frequency distribution with respect to

preferred diagnostic modalities, treatment initiation/cessation criteria, treatment regimens, record keeping etc were generated.

Limitations of The Study: Record keeping at the level of private practitioners was very minimal and insufficient to confirm the information provided.

FINDINGS

It was found that nearly 50% of private doctors considered sputum examination for acid fast bacilli (AFB) for a period of three consecutive days, as their most reliable criteria to diagnose pulmonary tuberculosis but this was actually carried out on only 38% of the patients. Various contributing factors cited being, inadequacy of lab services in terms of number as well as reliability, poor patient paying capabilities. Data seems to suggest there is extreme reliance on chest X-ray as a diagnostic method, being done by nearly 40% of the respondents as their first investigation.. As many as 31 treatment regimens were found in use among 101 doctors, which were mostly non-recommended and irrational. Also, their patients were less likely to complete treatment as the practitioners completely lack in the system of recording, reporting or retrieval of defaulting cases. All of the respondents prescribed a daily dose regime for their patients. Only about 50% of the respondents reported that more than 80% of their tuberculosis patients completed their full duration of treatment. Although awareness of private doctors w.r.t. DOTS was nearly universal, their knowledge about its efficacy and desirability was minimal. 50% of the private doctors were found unaware of provisions for private practitioners within DOTS. When asked, following suggestions were given by Private Practitioners to increase their participation in DOTS

Suggestions	Percent respondents
Increase awareness in doctors about schemes in DOTS	26.7
Increase awareness in patients/general public	15.8
Provide manpower support to trace defaulting cases	6.0
Do not allow OTC sale of ATT	2.0
Relax residence proof formalities so that more patients can get treatment privately.	7.9
Stop DOTS	2.0
Make local organizations more involved.	5.0
Take only referrals from PPs,	5.9
ensure drug supply	1.0
Establish nodal centers in private clinics for DOTS	5.0
Make DOTS a paid service	2.0
Establish good coordination between Govt & PPs	9.9
Augment lab services	1.0
Reserve DOTS only for poor patients	2.0
Involve only full time general practitioners for the purpose of DOTS	3.0
No suggestions	5.0

CONCLUSION

As is evident from the responses, most effective tool for better participation would be increasing awareness among practitioners. This can either be through residential trainings linked to re-registration for medical practice, clubbing with other CMEs, incentive linked initiatives. Patients should also be educated about their rights & responsibilities whenever they initiate treatment.

Policy Implications : Strengthening of IEC services, for private doctors as well as general public with focus on option of getting free DOTS from private. Legislative measures in the form of regulating the operations of private doctors by making tuberculosis compulsorily notifiable so as to bring accountability. For long-term sustainability, there needs to be equality and respect between partners. The government functionaries must not try to dominate, although they clearly have a bigger role. Private – public partnerships take time and patience to develop, as mutual trust is to be created. These relationships can be extrapolated further for use in other programmes of public health. As in any partnership, particularly in an area, which is both new and complex, the two main principles that must be followed are Confidence and Clarity. There must be confidence on both sides that what each side contributes is respected and will not be diverted from its principle purpose; each side is responsible for its decisions. There must be clarity both in lines of responsibility and accountability and in specific areas of collaboration, here tuberculosis. These activities can go a long way in building up mutual trust and interdependence between the private and the public sector health functionaries. Following structural & procedural improvements are imperative

- Augmentation of lab services, both in terms of quality as well as quantity, perhaps through collaboration with private labs.
- Development of a feedback system in the form of a referral link as a medium of mutual exchange of information.
- Implementing an effective continuing medical education programme for practicing doctors, and linking it with their registration and continuation of their license to practice.

Also, a significantly large network of labs that provide quality microscopic examination must be established. Apart from increasing the number of microscopy centers under the RNTCP, private operators should also be encouraged to set up their own facilities. These private labs should seek accreditation, which enables the NTP to introduce quality control to confirm that the labs carry out their work according to international guidelines. These labs can be re-imbursed their costs incurred on sputum testing and/or chest X-ray and other investigations by the government. The findings of the study indicate that the inclusion of the private sector in the National TB Control Programme is the need of the hour. It emphasizes that the Private sector needs to deliver good TB care (DOTS/Non DOTS) as per the guidelines of RNTCP, including maintaining treatments cards and informing the public sector about any deviations in delivery of DOTS.

On the other hand, the programme managers should pay due attention to the problems convenience and comfort of practicing doctors while planning TB control activities. It is imperative that financial gains of private practitioners are given due consideration. The practitioners in turn should be encouraged to be actively involved in case finding and case holding activities in their areas of practice and be provided with subsidized sputum examination/chest X ray facilities and free drugs.

The following remark by a practitioner representing the fraternity of private doctors is full of enthusiasm and hope:

RNTCP is yet the friendliest face of the Government to the private healthcare delivery system. The success of RNTCP in Public-Private partnership is due to the human bonds built by its dedicated team. They have overcome many a challenge to build these bridges. Now, the doctors in the private sector have to stand shoulder to shoulder in this Kurukshetra.

It remains to be seen what happens of this fight against tuberculosis.....if lost, the miserable sufferer shall be mankind.

Private –public partnerships are feasible and can be effective in this context. Private-Public Mix (PPM) can contribute positively to the performance of RNTCP. RNTCP should be seen as the first step towards a direction in engaging private sector in public health programmes.

Conflict of Interest : None

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The Cost Analysis of Sonography at SBH Govt. Medical College and Hospital, Dhule

Vinod Mundada¹, Sunil Gite²

¹Assistant Professor, Department of Community Medicine Government Medical College, Aurangabad, Maharashtra, India, ²Assistant Director, Regional Office of Health and Family Welfare, Raipur, Chhattisgarh, India

ABSTRACT

Objectives:

- 1) Estimate the cost of each Sonography patient.
- 2) Compare the estimated cost with the existing user fee.

Type of study: Cross sectional, non- participatory observational study.

Study period: April 2009 to March 2010.

Participants: Work analysis of all the working Departmental staff and analysis of existing records

Methodology: The data was retrieved from the records available with the Department of Radiology and the administrative section of the hospital. The data was corroborated with the personal observation by the investigator. The observation includes the number of Sonography performed each day. The actual cost estimation was based on the economic principles. Cost of the infrastructure was estimated and confirmed through the available records. Necessary depreciation for all the equipment was calculated adjusting the cost of the building according to the prevailing market prices was carried out. Recurring expenditure was calculated on weekly basis. A manpower cost was based on hourly charges for the salaried employees.

Result and discussion and conclusion: Total 4756 patients were visited for Sonography. Analysis indicates that the cost incurred is more than the charges fixed by the government. The prevailing cost for the examination is exuberantly high compared to the estimated cost.

Keywords: Cost Analysis, Sonography , Cost Estimation

INTRODUCTION

In developed countries the concern about the high cost of health care in light of scarce national and government resources has resulted in the close examination of the hospital sector of the health system¹. There is also interest in dealing with the cost of operating and investigative procedures in the hospitals amid

indication of widespread wastage within health sector. Studies indicated that estimated wastage accounts for as much as 40% of the available resources for health services.²The cost functions are commonly utilized for the unit of cost estimated.

A hospital laboratory and investigative services is an economic asset to the hospital since it is income generation service.³ All the public hospitals collect the user fee for this investigative procedure. The amount to be collected as user fee has been fixed by the Government of Maharashtra. However, estimation of the actual cost incurred to these investigations would be able to suggest revision in the user fee if necessary. The information obtained from a cost analysis also help the organizations operate more cost effectively.

Corresponding author:

Vinod Mundada
Assistant Professor,
Department of Community Medicine, Government
Medical College, Aurangabad, Maharashtra, India
Tel (Mobile): 919422289312
E mail: vdmundada@gmail.com

The objectives of this study were to estimate the actual cost incurred by the hospital for one Sonography investigation and to assess the adequacy of fee structure thereby estimating the subsidy provided by the public hospital. The cost has also been compared with the prevailing market price.

MATERIAL AND METHOD

The present study has been carried out analyzing the available records between April 2009 to March 2010. The type of study was cross sectional record based study intervened with staff interview has been carried out at SBH Government Medical College and Hospital.

The data was retrieved from the records available with the Department of Imagiology and the administrative section of the hospital. The data was corroborated with the personal observation by the investigator. The observation includes the number of Sonography performed each day. The actual cost estimation was based on the economic principles. Cost of the infrastructure was estimated and confirmed through the available records. Necessary depreciation by diminishing balance method for all the equipment was calculated. Adjusting the cost of the building according to the prevailing market prices was carried out. The direct labor cost is calculated on the basis of the salary of qualified radiologist, registrars, interns and laboratory technician and number of hours of their work in the department. The number of hours spends in the teaching and training of medical graduates has been calculated separately and is not included in the cost estimation.

As there is separate sub meter for radiology department and the different section of it, electricity bill were calculated based on actual payments made. The recurring administrative and general expenses are taken from the book of account for financial year 2009-2010.

The total estimated cost was divided in two types as per definition⁴. The Capital costs are those for resources that last more than one year (e.g. buildings, Sonography, furniture etc), Capital inputs are purchased at a point in time, but are used for a period; therefore their costs need to be spread over that period. Whereas recurrent costs refer to the input which last less than one year and are regularly purchased.

FINDINGS

Table I. Detail costing about the Particulars of Sonography centre

Particulars	Cost (rupees)	Percentage
Machine	12,87900	81.79
Salary	1,67235.43	10.62
Stationary	600	0.04
Material	38500	2.45
Building	36,000	2.29
Furniture	9,502.68	0.60
Electricity	34,343.5	2.18
House keeping services	487	0.03
Total		15,74,568.61
Cost of one patient		331.07

Table II. Showing the costing of the each Sonography Patient

Particulars	Rupees
Machine	270.79
Salary	35.16
Stationary	0.13
Material	8.10
Building	7.57
Furniture	2.00
Electricity	7.22
House keeping services	0.10
Total cost of each sonography	331.07

Table III showing the capital and recurrent cost

Type of Cost	Rupees	Percentage
Capital cost	1287900	81.79
Recurrent cost	286668.61	18.21
Total	1574568.61	

The above table number I, II, and III shows the following things

Sonography machine: There was single Sonography machine. The capital cost of the machine was calculated by diminishing balancing depreciation method and it contributed about 81.79% of the total cost. There was no maintenance from the date of purchase to the study period. The 4756 patients were visited to the Sonography unit during study period.

Salary: the actual working hourly salary of the staff engaged in Sonography unit was taking during study

period. The amount of salary was Rupees 1, 67,235.43. The salary amount contribute about 10.62%.

Electricity: Electricity reading and unit cost information were taken from electricity department of the Hospital. The total electricity bill for imagiology during study period was Rs 34,343.5 and it contributes 2.18% of the total cost. If we divide this amount by number of Sonography during study period, the electricity cost of each Sonography was Rs 7.22.

Furniture: The cost of furniture was taken from the RC book and administrative section of the college. The furniture which is concerned to the Sonography were included. The present cost of furniture was calculated as per diminishing balanced depreciation method. The capital cost of the Furniture was Rs 9,502.68.

House keeping services and Stationary: The House keeping services were includes water and cleanliness material used in the Sonography unit. The cost of house keeping services was Rs 487. The stationary includes patients, attendance register and papers for the reporting. So the cost of the stationary was Rs 600.

Sonography material: The Material was jelly and Sonography rolls. The total cost of these materials during study period was Rs 38,500. It contributes about the 2.45% of the total amount.

Fees structure: The fee that charged by the government for each Sonography investigation is 50 rupees for above poverty line patients while free for all below poverty line patient. While in private sector 350 rupees is charged for each Sonography investigation. There is much wider gap between Government and private sector regarding the fee structure.

Hypothetical Situation: If the number of patient increases, then how much increase or decrease in the cost of the sonography investigation occurs? For current situation, the cost of each investigation was 331.06

rupees, if the number of patient were 4756. If the number of patients gets doubled then the cost of the investigation reduces from 331.06 to 190.84 rupees. There was increase in the recurrent cost while capital cost remains same or slightly increasing.

CONCLUSION

The cost of the Sonography per patient as per economic principle in Government Hospital is Rs 331.06 rupees. This analysis indicates that the cost incurred is more than the charges fixed by the government. The prevailing cost for the examination is exuberantly high compared to the estimated cost.

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Conflict of Interest: NIL

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Management of Ocular Defect by Maxillofacial Prosthesis - A Case Report

Vivek Choukse¹, Manoj Upadhyay², Amrit Tandan³

¹Reader, Department of Prosthodontics, Modern Dental College & Research Centre, Gandhi Nagar Indore, (MP) India,

²Reader, ³Professor, Department of Prosthodontics, Prof. Department of Prosthodontics, U.P. Dental College And Research Centre, Lucknow, (U.P) India.

ABSTRACT

Eye defects constitute a major portion of maxillofacial defects which require prosthetic correction for esthetic and social rehabilitation of the afflicted patient. Treatment modalities include implant and acrylic prosthesis. Although implant eye prosthesis offer superior results, they may not be economically viable for all patients. A custom made ocular acrylic prosthesis is a good alternative. A case report of patient with acquired ocular defect who was treated with a custom made ocular acrylic prosthesis which had enhanced fit, retention and facial esthetics to a greater degree.

Keywords: Eye Defect, Ocular acrylic prosthesis, Retention

INTRODUCTION

A considerable number of people have various maxillofacial defects as a result of malignancy, trauma, congenital deformities and infection. Among these, eye defects are common and seen in younger age group. The eye is a vital organ not only in terms of vision but also in being an important component of facial expression. Defects of the eye, thus pose a serious setback to the patient in terms of facial esthetics, social acceptance and psychological well being. Thus ocular prosthesis should be provided as soon as possible to raise the spirit and ease the mind of the afflicted. These patients can be treated with custom made ocular prosthesis that has been adapted to accommodate the specific situation. One such case, reported to Government Dental College, Indore to seek maxillofacial rehabilitation.

CASE REPORT

A 9 years old female patient having defect in the right eye reported to College of Dentistry, Indore. On taking detailed history it was found that patient lost his right eye due to infection (differential diagnosis –

Sympathetic Ophthalmitis, Panophthalmitis, Congenital Glaucoma, Retinoblastoma) when she was 3 years old. Since then patient was having defect in the right eye. The patient was unaware of custom made ocular prosthesis and she has been put up with a lot of psychological trauma due to eye defect. The patient was made aware of custom made ocular prosthesis, its advantages of exact fit and improved esthetics.

HISTORY – REVIEW OF LITERATURE

The art of making artificial eye has been known to man from the days of the early Egyptian and the Peruvian Indian, but not until the time of World War II, and the development of the refined plastics which came then, has there been a satisfactory esthetic ocular prosthesis.

The origin of maxillofacial prosthesis is difficult to trace, but it may be assumed that the prosthetic restoration of missing part of the face was practiced before surgical procedures became feasible. According to Popp (1939), artificial eye, nose, and ear were found on Egyptian Mummies. Dating from very early times in Egypt (i.e. pre dynastic period, before 3000 B.C.) simple inlaid eyes consisting usually of whitish shell beads, have been found and human figures bearing such eyes are to be seen in Cairo Museum.

Ambroise Pare, a Frenchman (1510-1570) was the first medical writer on the subject of the maxillofacial prosthesis. He suggested the use of prosthesis as valid

Corresponding author:

Vivek Choukse

FH-82, Scheme No. 54, Vijay Nagar, Indore (MP) 452010

Ph. No - +91731-2551945

Mob: +919826034340

Email: vivc_12@yahoo.com

alternative to surgical reconstruction. He was the first to use both glass and porcelain eyes and was first to use an obturator to close palatal clefts.

The physiologic ocular prosthesis as fabricated in the dental corps of United States Navy and by others was documented by Murphy et al (1944) and by Niiramen (1947). Two acrylic ocular prostheses were made by Sykes L.M. (1966).

CLINICAL AND LABORATORY PROCEDURES

Patient's Examination

At the first appointment the patient was seated in the dental chair. Eye socket was examined for degree of healing, tonicity of ocular muscles and need for surgery. His medical records were inspected at this time and his psychological attitude towards wearing ocular prosthesis was evaluated. The patient was reassured about the esthetic results and was convinced there will be no pain and discomfort in the procedure.

FABRICATION OF STOCK TRAY FOR ANATOMIC IMPRESSION

A hollowed needle cover was used as a handle. Auto polymerising resin was mixed in adequate consistency and given approximate shape of the eye and was attached to one end of the hollow needle cover.

ANATOMIC OCULAR IMPRESSION

Patient was positioned upright in the chair and trained in maintaining a fixed gaze on a point directly in front of him and in midline position. A piece of a tape placed on the wall at the desired spot will aid the patient in maintaining correct line of vision. Anaesthesia was not considered necessary in this case and was not used.

KY jelly was used as surface lubricant to reduce the irritation and facilitate lubrication while taking impression.

A modified impression technique, where an impression tray is in the shape of an ocular prosthesis. The impression tray was placed within the socket to support the eyelid and provide a normal contour. The tray adhesive was applied over the surface that will carry impression so that it flows easily and was injected into the socket with a syringe through the hollow handle of the impression tray. The socket may be momentarily overfilled with the thin mix of impression material, but the tissues pressed the excess out through both the hollowed handle and periphery and allowed only the

optimally needed volume to remain. The operator stabilized the tray throughout the impression procedure. This allowed the impression material to flow over the underlying muscle bed and the anatomic details to be recorded accurately. Once the impression material was set the patient was instructed to blink the eyes to break the air seal and impression was carefully removed from the socket and visualized for any void or other defects. Trimming of the excess impression material was done.



Fig. 1. Impression of ocular defect.

Fabrication of custom tray for functional impression

The split two piece dental stone mould was prepared. The dental stone was poured to immerse the lower half of impression after boxing. Once the stone sets keyholes were cut, separating medium was applied and the mould was completed with a second mix of stone. The prepared mould was used in construction of custom tray.

Self cure is mixed in dough consistency and inserted into the base part of the mould and then counter part of the mould is lubricated and then resin is inserted in it. Then both the base part and counter part of the mould were approximated then excess resin material was removed. The prepared custom tray was removed from mould and finished.

FUNCTIONAL OCULAR IMPRESSION

All the pre procedures were applied as like primary impression. Then tray adhesive was painted over the custom tray to carry the impression material. Light body silicon impression material applied on the tray and gently inserted into the socket. The operator stabilized the tray throughout the impression procedure at that time the patient was instructed to blink the eye and right and left movements of eyeball.



Fig. 2: Functional ocular impression

STONE MOULD FABRICATION

The split two piece dental stone mould was prepared in a manner discussed previously. The prepared mould was used in the construction of wax conformer. The stone mould was lubricated with petrolatum and a medium hard dental wax was poured to prepare the wax conformer.



Fig. 3. Stone mould.

ALTERED WAX CONFORMER FABRICATION

Altered wax conformer is now tried in eye and lid contour was evaluated and addition and reduction of the wax was done till the satisfactory lid contour was achieved and then iris is located.



Fig. 4. Wax conformer try in

IRIS LOCATION

Patient was instructed to stand in a relax position and to look at a distant point during this procedure patient's right eye with wax conformer in it was compared with patient's left natural eye. The central of the pupil of the conformer was located and marked with pointed applicator stick dipped in waterproof ink. Iris corneal button from commercial available stock shell eye was selected to match the diameter and colour of the natural eye. The wax inside the circle was removed to the depth of 2-3 mm and iris corneal button was inserted in this circle. Iris corneal button was waxed in position and was inserted to the socket to verify its position. This wax conformer with iris button was tried and checked for its accuracy in term of position and all the possible movements in comparison to the left eye and the necessary corrections were done till satisfactory results are achieved.

PREPARATION OF MONO-POLY

Mono-poly is made by combining 10 parts heat-cure acrylic monomer to one part clear acrylic polymer by weight to combine the monomer and the polymer a pan of water is heated and brought to a light boil. The monomer is then poured into a Pyrex beaker. The beaker is placed in the pan of boiling water and when the monomer is warm, the polymer is sifted slowly into the monomer while stirring continuously with a glass rod until it reached the medium viscosity.

REPLICATION IN SCLERAL COLOURED ACRYLIC RESIN

White acrylic resin was selected the wax conformer was flaked and dewaxed in conventional manner. Iris corneal button was removed and placed back in the stone mold. When white acrylic resin reached in dough stage then packed in mold. Trial pack was taken and excess flash was removed. After heat curing, ocular prosthesis was removed from mold and finished.

From this ocular prosthesis 0.5-1 mm acrylic was reduced in the anterior scleral region around the iris corneal button then the monopoly was given colour according to the patient's left eye sclera. The acrylic ocular prosthesis was fitted on the tissue side mold with reduced position upward and the prepared monopoly was applied on the reduced surface. Red fibers of the veined acrylic powder were added to give vein effect of sclera. This layer of monopoly applied over reduced surface is cured partially with the help of

light cure gun. Then the mold with ocular prosthesis was packed over the counter part and processed.

DELIVERING THE OCULAR PROSTHESIS

Properly finished and polished ocular prosthesis was inserted in the eye socket and examined for aesthetics and degree of various movements. Minor corrections were done as required and the ocular prosthesis was again finished and polished before insertion.

PATIENT INSTRUCTION

Method of inserting and removing the prosthesis and its care are demonstrated to the patient. The prosthesis should be removed at least once a day for cleaning. The prosthesis should not be allowed to come in contact with alcohol or solvent of any kind as this would cause crazing of the acrylic resin. It should be washed with mild soap once every 1 or 2 weeks. More frequent cleansing would be indicated if particularly or dirty conditions were encountered. With the prosthesis removed, the soft tissues of the socket are rinsed with an ophthalmic irrigation solution.



Fig. 5. Pre operative

DISCUSSION

Till date health practitioners especially ophthalmologists are not successful in restoring the function of the lost eye and we satisfy the patient and try to rehabilitate him only esthetically and psychologically. But this is a great challenge to the skills of the prosthodontists and material available. The eye defects especially ocular, present some limitations to the rehabilitation abilities. Ocular defects can be managed wonderfully along with appreciable movement of prosthetic simulating natural eye.



Fig. 6. Post operative

Best prosthesis would be one, which is not recognizable by anybody. Orientation of correct gaze and camouflaging the borders of the prosthesis and achieving perfect or near perfect texture and colour helps to offer better results to the patients.

CONCLUSION

The use of stock ocular prosthesis of an appropriate size and colour adapted by selective grinding or addition of acrylic resin in tissue contact surface is advocated to facilitate seating of prosthesis. Standard technique can produce excellent results for most patients provided the operator has done an appropriate selection of the prefabricated eye. However, because of extreme individual variation and diverse nature of ocular injuries certain patients would benefit more from custom made ocular prosthesis that are modified to individual needs. The aesthetic and functional results justify the extra effort fabricating custom made ocular prosthesis.

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A Study of Knowledge & Awareness Regarding HIV / AIDS among Nursing Students

K P Joshi¹, M Robins², Debjani Mitra Sen³, KM Mallikarjunaih⁴

¹Associate Professor, Department of Community Medicine, ²Prof. & HOD, Dept. of Community Medicine, ³Tutor, Dept. of Community Medicine, ⁴Asst. Prof. Statistics, Dept. of Community Medicine SVS. Medical College, Yenugonda, Mahabubnagar (A.P.)

ABSTRACT

Background: HIV/AIDS can be called our modern pandemic, affecting both industrialized and developing countries. According to UNAIDS estimates, there are 33.3 million people living with HIV in which 30.8 millions are adult (15.5 millions are women) and around 2.5 millions are children. During 2009 some 2.6 million people newly infected with HIV and an estimated 1.5 million people died from AIDS. So HIV today is a threat to men, women and children of all continents. Due to frequent and prolonged contact with the patients, nursing students are being identified as a potential high risk group for the HIV/AIDS spread so keeping this thing in mind we have selected the nursing students for the study to assess their level of knowledge & awareness regarding HIV/AIDS.

Research Question: What is the level of knowledge and awareness among Nursing students regarding various aspects of HIV/AIDS?

Objective: To assess the level of knowledge and their awareness regarding HIV/AIDS

Study Design: Cross Sectional Study

Setting and Participants: All Nursing Students of SVS Nursing College, Mahabubnagar.

Methodology: After the ethical clearance, the Present study was carried out in the last week of November 2011, with the aim to assess the status of knowledge and awareness regarding HIV/AIDS among 2nd, 3rd, & final year nursing students of SVS college of nursing, Mahabubnagar A.P. For collection of data a pre designed, pre tested questionnaire were given to all the participants to fill up during the class in the lecture gallery who were present on that day. The data was collected and analyzed in descriptive statistical method.

Results: Out of total 190 nursing students, 168 (88.42%) students participated in this study, in which 83% were female & 17% were male. Most of the students (96%) were in the age group of 18-24 years. The full form of HIV and AIDS were not known to 48% & 17% participants respectively. Around 83% participants said that sexual route is the most common route for HIV transmission. Around 3.58% participants were having the misconception that HIV transmission is possible through hugging, sharing toilet seats, towels, utensils, shaking hands with HIV infected patients. Most of students (95.23%) were aware regarding the various preventive measures for HIV/AIDS. Around 86.90% participants were aware that most commonly immune System is affected by HIV. Some 14.88% participants said that Vaccine is available for HIV/AIDS & 15.47% said that it is curable. Around 31% participants were afraid of cross infection in giving nursing care to HIV/AIDS. Around 44.50% participants said that ART in PEP for HIV/AIDS is not useful.

Keywords: HIV/AIDS, Nursing, PEP, ART, etc

INTRODUCTION

Acquired Immuno Deficiency Syndrome (AIDS) is a fatal illness caused by a Retrovirus –Human Immuno-Deficiency Virus (HIV) that breaks down the body's Immune System leading to a host of life

threatening opportunistic infections and other complications¹. Among the special features of HIV infection are that once infected, it is probable that a person will be infected for whole life. Strictly speaking that term AIDS refers only to the last stage of HIV infection. AIDS can be called our Modern Pandemic

,affecting both industrialized and developing countries². During 2009 some 2.6 million people newly infected with HIV and an estimated 1.5 million people died from AIDS³. So HIV today is a threat to men, women and children of all continents. Amongst the health care professionals, nurses and nursing students are an important component of the health care delivery system & very important part of health team. Since they are the one who are responsible for the constant care of out and in-patients and thus, they come in close contact with blood and other body fluids of patients. Due to frequent and prolonged contact, they are being identified as a potential high risk group for the HIV/AIDS spread. To reduce the transmission among this group, adequate knowledge regarding epidemiology of disease & awareness about the disease and practice of safety measures are of great importance and can play crucial role in prevention of HIV spread. Keeping this thing in mind we have selected the Nursing students for the study to assess their level of knowledge & awareness regarding HIV/AIDS.

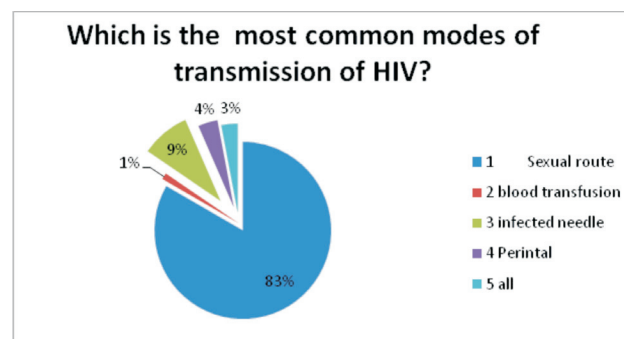
METHODOLOGY

Present study was carried out in the department of Community Medicine SVSMC, Mahabubnagar, AP during last week of November 2011, with the aim to assess the status of knowledge and awareness regarding HIV/AIDS among 2nd, 3rd, & final year nursing students of SVS college of nursing, Mahabubnagar A.P. Permission from ethical committee of the SVS Medical college were taken before conducting the study. In present study any intervention or any drug/vaccine trial was not done. Informed consent was taken by all the participants.

The study was designed as cross-sectional study. All 168 students who were present on that day were included as participants. For collection of data a pre designed, pre tested questionnaire were given to the participants to fill up during the class in the lecture gallery. Around 25 open ended questions were asked in the questionnaire regarding the basic general information, magnitude, modes of transmission, wrong concepts, treatment and prevention of HIV/AIDS. 30 minutes time was given the students to fill up the questionnaire. During this period invigilation was done by Faculty members of community medicine. Questionnaires were collected and analyzed in descriptive statistical method.

RESULTS

Out of total 190 nursing students, 168 (88.42%) student participated in this study, in which 139 (83%) were female & 29 (17%) were male participants. Around 47% students came to know about HIV/AIDS first time after entering in nursing course only. Around 3.58% students believed that HIV can be transmitted through hugging, sharing toilet seats, towels, utensils, & shaking hands with AIDS patients & 13% students were having misconception that it can transmit through mosquito bite also. Knowledge regarding the Magnitude of HIV/AIDS in India was poor as only 14% students could answer correctly. Around 19% participants were not having the knowledge of common symptoms of AIDS disease.



Above graph shows that 83% students said that sexual route is most common mode of HIV transmission.

Around 87% participants were having correct knowledge that HIV attacks on immune system of human body but 2.97% said that it affect respiratory system, 1.78% said digestive system & 8.33% cardiac system mainly. 61% of participants were having the correct knowledge regarding high risk groups for HIV/AIDS transmission. Only 67% nursing students were known to universal precautions. 15.47% participants said that complete cure of AIDS is available & Some 14.88% participants said that there is Vaccine available for HIV/AIDS. Around 44.50% participants did not know that Post Exposure Prophylaxis of ART can be useful in accidental HIV infection. Around 97.61% participants were aware that World AIDS day is celebrated every year on 1st December & 69% were aware regarding Red Ribbon Club. Around 72.62% participants said that Behavioral change Communication (BCC) can help in prevention of HIV/AIDS.

TABLE 1. From where do you gather all this knowledge & information regarding HIV/AIDS?-

1. Study(books)	137	81.54%
2. TV	09	5.36%
3. News papers	10	5.95%
4. Friends & peer group	12	7.15%
5. Total	168	100%

TABLE 2. According to you which is the best method for creating awareness regarding HIV/AIDS among general population?

1. TV	145	86.31%
2. News papers	09	5.36%
3. Drama/folk play	05	2.97%
4. Announcement	02	1.19%
5. Posters& Pamphlets	07	4.17
6 Total	168	100%

Above table 1 shows that most of the students (81.54%) gathered the information regarding HIV/AIDS from study by books, 7.15% from friends & peer groups, from TV -5.36% and 5.95% participants got information from news papers. On other hand TV (86.31%) was considered best method for creating awareness regarding HIV/AIDS among general population. In last when we asked that in future will you nurse HIV/AIDS patients knowingly? Around 69% said yes they will nurse and 31% said they are afraid of nursing HIV/AIDS patients because of risk of transmission.

DISCUSSION

HIV infection is not only a significant health problem but also one of the most important social issues of the twenty-first century⁴. Every HIV positive patient is a potential candidate for disease transmission to the Attending health care workers. Amongst the health care professionals, nurses and nursing students are an important component of the health care delivery system. Since they are the one who are responsible for the constant care of in-patients and thus, they come in close contact with blood and other body fluids of patients. Due to frequent and prolonged contact, they are being identified as a potential risk group for the HIV/AIDS spread. While the basic information about the disease like causative agent, modes of transmission, etc. were known to most of the participants, deficiencies in their knowledge and awareness in many critical areas of the disease were noticed. These deficiencies in knowledge influence their behavior thus, exposing them to the risk of transmission.

As it can be seen from the present study that misconceptions regarding transmission of the disease

are high which can further lead to discrimination in patient care or apprehensions and stress amongst the healthcare providers while dealing with such patients. An awareness study on HIV/AIDS on nursing students of Delhi by Kumar et al⁵ also revealed a high level of popular misconceptions. Similar misconceptions have also been reported among medical school faculty and students⁶.

Students awareness and opinion about HIV/AIDS in the current study was fairly good which is similar to study findings by Dutta et al⁷ in Kolkata and Kumar et al⁵ in Delhi among the nursing staff. In present study the Students' attitude with regard to receiving unscreened blood looks to be quite a casual one, only 13% of them were ready to accept unscreened blood during any emergency. Quite similar observation was found in Naveen K. Goel et al⁸ study where Fifteen per cent of student were ready to receive unscreened blood in case of emergency. This finding is also similar to the findings of another study conducted among staff nurses of Banaras Hindu University⁹. Perhaps they were not aware of the fact that the probability of contacting the disease through blood or blood product is more than 90 per cent. They require proper knowledge in this regard as they are cornerstones of our health delivery system.

In the present study, study from books appears to be the main source of knowledge & information on HIV/AIDS (81%) but Television comes first as main source for creating awareness (86%). This suggests that this mass media tool has reached to most of the population and may be utilized properly to create awareness. Similar findings were found in a study conducted by Naveen K. Goel et al, HIMC, Dehradun, UK.⁸

In present study it is very encouraging to see that 98 per cent of the students are eager to participate in campaigns against HIV/AIDS which indicates that new generation is prepared mentally to equip themselves with the correct knowledge this finding is also similar findings were found in a study conducted by Naveen K. Goel et al, HIMC, Dehradun, UK⁸.

The present study reflects that around 67% students are aware regarding various methods of universal Precautions to protect themselves as well as their patients from the dreadful disease. Steirborg¹⁰ found positive correlation between knowledge and attitudes. He also observed that nursing students having HIV/AIDS care experience had significantly more positive attitude than those without such experiences.

Continuous & periodic training & awareness programs are required to sustain the effect of these activities so that it could enable them to overcome fear, tension, discomfort and anxieties about HIV/AIDS.

CONCLUSIONS

The overall general knowledge & awareness about the diseases was considered to be good among the study participants. Some misconceptions about HIV/AIDS were found and immediately corrected through the health education intervention, as detected by the improved correct response rates. However, a small proportion still exists and needs to be addressed by repeated & periodic health education programs. Television was found to be the most important source of knowledge & awareness among our study participants that shows impact of mass media on younger generation. Based on review of the reported literatures from our country on this topic till now and the outcomes of the present study, it is clear that our efforts in the last two decades in spreading the knowledge about the disease have met with some limited success. The fact that increasing number of cases of HIV/AIDS are being reported from various parts of the world coupled with increased incidences and prevalence of the disease in the bridge population, it is imperative for the health care policy makers to review and reorient the ongoing training programmes¹¹. Apart from this group discussions and various other innovative methods of teaching practices can be included in the curriculum of nursing course with emphasis on more on training and counseling for HIV/AIDS to enable them to act as a counselor.

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Conflict of interest: In the present study the presence of a conflict of interest is independent from the execution of impropriety. In the present research study primary interest which refers to the principal goals of the profession or activity, such as the protection of subjects, the health of participants, the integrity of

research, and the duties of public office were maintained without any failure. There was no hazards for environment or human or animal life in this study. This Secondary interest like any financial gain or any wish to do favors for family and friends or colleagues was not done by this study. This study was conducted mainly for research, learning & professional advancement.

Source of support: The present study was conducted in minimum expenditure and whatever fund & support was required, it was fully given by the management of SVS Medical college, Mahabubnagar (SVS Educational Society). No other funding agency is involved in this study.

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Rehabilitation of Mandibulectomy Patient with an Overdenture - A Case Report

Y Sravanthi¹, Asha Rathod², K Lakshmi Deepa³, Indira Priyadarshini³

¹Senior Lecturer, Department of Prosthodontics, Leonara Institute of Dental Sciences, Rajahmundry, Andhra Pradesh,

²Professor, Department of Prosthodontics, D.Y. Patil College of Dental Sciences And health, Navi Mumbai, India,

³Senior Lecturer, Department of Endodontics and Conservative Dentistry, Leonara Institute of Dental Sciences, Rajahmundry, Andhra Pradesh

ABSTRACT

Mandibular defects caused by surgical intervention to eradicate or control disease like carcinoma frequently involves jaw resection. Loss of continuity of the mandible, destroys the balance of the lower face and leads to decreased mandibular function, by deviation of the residual segment towards the surgical site. The amount of deviation depends on the amount of hard and soft tissue involvement, the method of surgical site closure, the degree of impaired tongue function, the number of remaining teeth and the extent of loss of sensory and motor innervations. The most challenging thing in maxillofacial cases is attaining retention and stability along with esthetics and function. This clinical report describes the use of over denture to provide better retention for a hemi mandibulectomy patient.

Keywords: Over Denture, Retention, Hemi Mandibulectomy

INTRODUCTION

Tumours in the mandible usually require surgical removal with or without resection of normal bone at the margins of the lesion. Smaller lesions removed without discontinuity of the bone are relatively simple to restore with prosthesis, while larger lesions may be more difficult to restore even though the continuity of the mandible is maintained¹.

The presence or absence of natural teeth in a resected mandible often determines the approach to prosthetic rehabilitation. Cantor and Curtis (1971) classified edentulous mandibular resection patients by the amount of mandible that remains after resection and surgical reconstruction. Although the classification was suggested for edentulous patients, it is also applicable to partially edentulous patients (Firtell and Curtis, 2002).

Cantor and Curtis (1971) devised a prosthetic classification as follows:²

In class I mandibular resection, there is radical alveolar resection and the continuity of the mandible is preserved. The class I patient functions well with removable partial denture.

In class II mandibular resection, the total mandible has been resected distal to the canine. In this class there is associated loss of function of the attached muscle resulting in deviation of the remaining mandible toward the surgical defect. When compare to class I patient, there is more difficulty in rehabilitating with prosthesis.

In class III mandibular resection, the mandible is resected to the midline or possibly beyond. The patient in this class presents with increased problems with mandibular deviation and denture instability.

In Class IV mandibular resection, there is a lateral resection and subsequent bone augmentation to form a pseudo articulation of bone and soft tissue in the region of the ascending ramus. In this class of patients there is less mandibular deviation.

In class V mandibular resection, there is anterior resection that crosses the midline but bilateral mandibular articulation has been maintained and the continuity of the mandible has been restored surgically by placing an autogenous bone graft.

The class VI mandibular resection patient is similar to class V patient but the continuity of the mandible

has not been restored surgically. Because each lateral fragment moves individually, the prognosis for removable prosthesis is poor.

CASE REPORT

A patient named Ganapath Belse of age 72 years came to the Department of Prosthodontics, Leonara college of dental sciences, with the chief complaint of disfigured face and inability to speak properly and unable to chew.

Patient gave history of carcinoma on right side of the face due to the habit of tobacco chewing. He underwent resection of the left half of the mandible and maxilla two years back and had completed the radiation therapy dosage.

FINDINGS

Extraoral examination

1. Ovoid face with mandible deviating towards the left side.
2. Mouth opening was only two fingers opening (Fig.1).



Fig.1.Pre treatment facial view

Intraoral examination

1. Resected maxilla on the left side distal to the canine region with teeth present in relation to 11, 12, 13, 14, 15, 21 (Fig.2).
2. Mandible resected upto the midline region on the left side with teeth present in relation to 41, 42, and 43.
3. The buccal mucosa on the left side was taught due to scar formation.

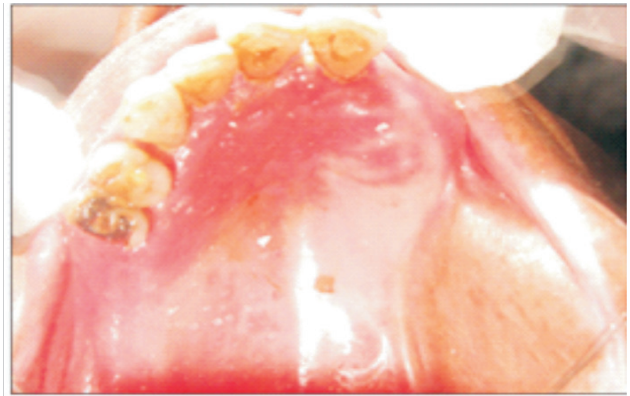


Fig.2. Intra oral view- Maxilla

4. Patients mouth was dry and the teeth present were having a high caries index.

The treatment plan was to give a definitive prosthesis. Since retention and stability are very compromised in such cases the teeth present were decided to be conserved even though they had a high caries index to improve the retention and stability. A removable partial denture in the upper and an over denture in the lower were planned for the patient.

Pre Prosthetic management

The patient was instructed for frequent intake of water, to prevent dry mouth and to prevent the teeth from getting caries any further. He was also advised some physical exercises to improve the opening of the mandible.

Necessary root canal treatments were done for all the carious teeth and pre fabricated posts were given to increase the strength of the teeth in the maxilla. In the mandible root canal treatment was done to the teeth and preparation was done in relation to 41 and 42 to receive an over denture coping with root extension. 43 cannot be given an over denture coping because it did not had sufficient ferrule effect, hence it was rounded and smoothened, so that it does not hinder in the subsequent procedures (Fig.3).



Fig. 3. Intra oral view- Mandible with over denture copings

Prosthetic management

The mouth opening of the patient was very less, so segmental trays were taken and build with impression compound upto the areas which have to be recorded. After the build up was done the impressions were taken in alginate and poured with dental stone (Fig.4, 5). For mandible the impressions were taken after the over denture copings were cemented (Fig.6,7).

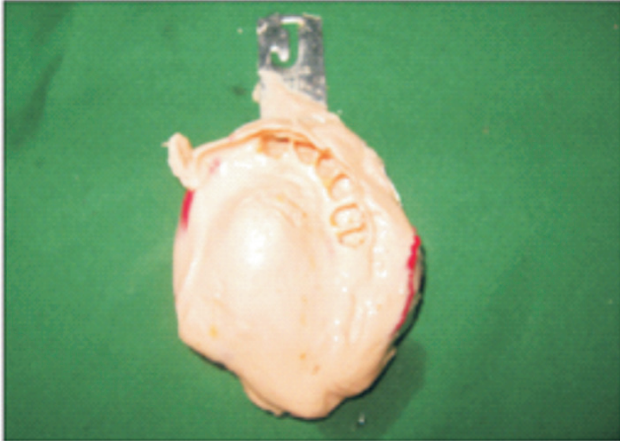


Fig.4. Maxillary impression



Fig.5. Maxillary cast



Fig.6. Mandibular impression



Fig.7. Mandibular cast



Fig.8. Post operative facial view

Jaw relations were recorded using self cure record bases and modelling wax. Vertical jaw relation was taken by Niswongers clinical rest position method, phonetics and aesthetics. The centric relation was recorded by pressureless method using Stapler pins. It was decided to use ovoid shaped anterior teeth depending on the form of the patients face. Since, there is deviation of the mandible, non anatomic posterior teeth were used so as to provide freedom of movement in the lateral direction³. A wax set-up was tried in the mouth and was checked for esthetics, phonetics, occlusal vertical dimension and occlusion. The dentures were characterised processed and then the occlusion was adjusted. Any interference in normal movements was corrected. The patient was given routine post insertion instructions and was motivated to make efforts to learn to adapt to the new dentures. The patient was satisfied with the dentures and his facial appearance was considerably improved. (Fig.8).

DISCUSSION

Most important factors that affect rehabilitation in Mandibulectomy as listed by Cantor and Curtis are location, extent of surgery, effect of radiation therapy, the presence or absence of teeth and psychosocial factors⁴.

Loss of facial structure, sensory and motor innervations complicates the control factor and together with the reduced denture base, contributes to a difficult complete-denture situation. The maxillo-mandibular relation cannot be recorded with any degree of accuracy in a deviated position to achieve a satisfactory occlusion. The occlusion is usually developed in a static centric position area.^{5,6,7} This position is achieved by the patients comfort, though it is not truly repeatable as a centric relation⁸.

As described, with the loss of the buccal and lingual sulcus and the presence of scar tissue, denture stability was extremely difficult to achieve in this case. Moreover, the mandibular deviation to the resected side is a hindrance in obtaining denture stability and occlusion. According to Devan 'Preservation of the remaining is of utmost importance than the meticulous replacement of which is lost'. So, all the remaining teeth were conserved by the necessary treatment which helped in improving the retention and stability of the maxillary denture. The non anatomic teeth used for restoring the missing teeth helped in minimising the lateral forces and improved the stability of the denture. The Over denture in the mandible not only improved the retention and stability but also preserved the proprioceptive sense of the patient which helped in guiding the patients mandible to the static centric position. The patient was instructed for frequent intake of water, to prevent any further caries of the remaining teeth, and frequent visits for maintenance.

CONCLUSION

Certain basic principles of construction of conventional dentures should be modified for mandibular resection patients because of many

restrictive physical factors. In this case successful rehabilitation has been achieved by preserving the remaining teeth which provided good retention, support and proprioception. The non anatomic teeth used also increased the stability of the dentures by decreasing the lateral forces.

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