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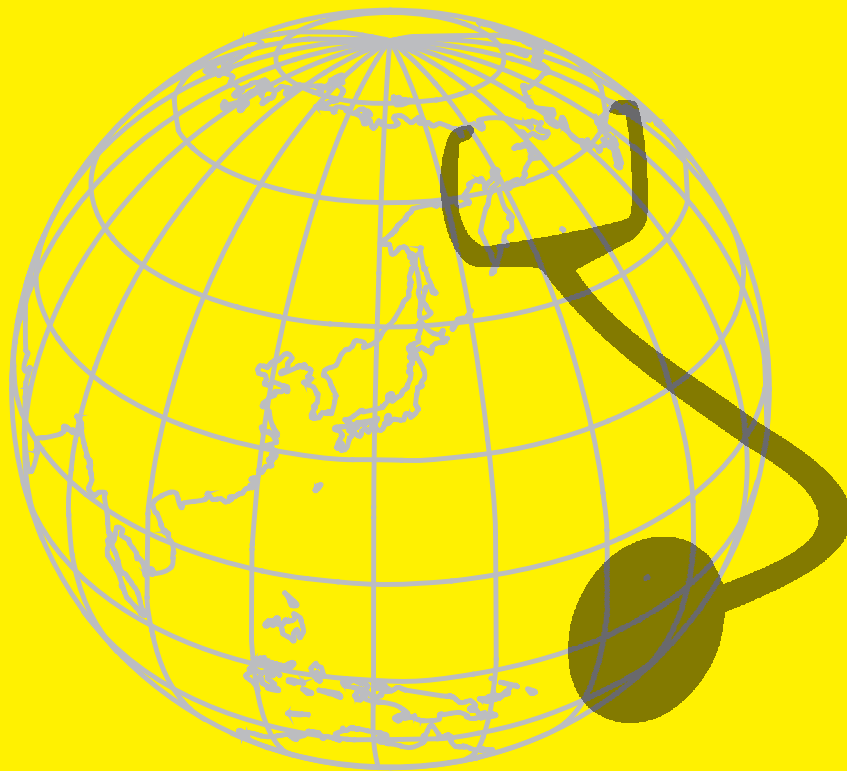
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# Epidemiology of Road Traffic Accident Cases in a Tribal District of Andhra Pradesh

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## ABSTRACT

Road Traffic Accident (RTA) is becoming a modern pandemic due to increase in population, vehicular density and meager infrastructure facilities. By 2020 road traffic injuries are expected to be the third leading cause of death and disability.

**Objective:** To investigate the various epidemiological factors related to RTA.

**Study design:** Descriptive study

**Participants:** 744 RTA cases reported during one year period from May 2009 to April 2010.

**Study variable:** Demographic characteristics of the RTA victims, time, month of accident, mode of accident and vehicles involved in accidents etc.

**Statistical analysis:** Percentages.

**Results:** Out of 744 RTA cases 612(82.26%) were males while 132(17.74%) were females. Agricultural workers were the 461(61.96%) highest among the victims by profession. Most of the victims 267(35.89%) were in the age group 21-30 years. The highest number of accidents 83(11.15%) took place in the month of December and 291(39.11%) RTA occurred between 12pm -6pm. Motorized two wheelers and three wheelers were most common vehicles involved in RTA. Amongst the drivers and occupants of different vehicles, drivers of motorized two wheelers 143 (61.27%) and occupants of motorized two wheelers 119(34.29%) were most involved victims. 115 (15.45%) RTA cases driving motorized two wheelers were under influence of alcohol and 35 cases occurred due to hit of two wheelers with animals at night hours. Thus, several epidemiological factors are found to be associated with RTA.

**Keywords:** *Epidemiology, Road traffic accident.*

## INTRODUCTION

There has been rapid growth of motorization in the last decade in India. This is associated with the concomitant increase in the Road Traffic Accident (RTA) related morbidity and mortality. The first reported case of road traffic fatality was Henry Bliss who was Pedestrian & was run over by a cab on 13 September 1899. According to the Global burden of disease project,

road traffic crashes caused over 1.27 million deaths in 2004. It is the top three causes of death for people aged between 5 – 44 years.<sup>1</sup> In India 84,430 persons were killed in RTA in 2003.<sup>2</sup>

Various causes are responsible for the occurrence of vehicular accidents. It can be human and environmental factors.<sup>2</sup> The human factor could be alcohol consumption while driving or casual attitude towards traffic rules & regulations. Moreover rapid unplanned urbanization has its own impact resulting in steep increase in vehicular accidents. Vehicle design & functional capacity is also a significant factor.

Adilabad is the northern tribal district located in Telangana region of Andhra Pradesh (A.P). Its rural population is 73% and forest area is 42.8% of the total geographical area according to 2001 census.<sup>3</sup>

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With this background, the present study was planned to evaluate the various epidemiological factors associated with road traffic accidents occurring in Adilabad.

**MATERIAL & METHOD**

Road traffic accident cases of all age groups that reported were included in the study. Road traffic injury was defined as an injury resulting from road traffic crash irrespective of the severity and outcome. The exclusion criteria included the injuries that do not involve any vehicle e.g. any individual who sustain injury due to fall on the road or person getting injured during washing or loading of a vehicle. A total number of 744 RTA cases reported during the one year period from May 2009 to April 2010 comprised the material for the present study. Various demographic and epidemiological characters related to the victim were gathered from either the victim or from the relatives or attender where the condition of the victim is not conducive. The medicolegal records & case sheets of the victim were also referred. All the data thus collected was analyzed statistically.

**RESULTS**

A total of 744 RTA cases formed the study population. Out of this, 612 (82.26%) were males and 132 (17.74%) female RTA victims (Table-1). It is seen that most of the RTA victims 267 (35.89%) were between 21-30 years followed by 193 (25.94%) RTA victims of 31-40 age groups. There were 37 (4.97%) children and 18 (2.42%) above 60 years (Table-2). Agriculture workers 461(61.96%) were most of the RTA victims by profession whereas 35(4.70 %) were unemployed (Table-3).

**Table-1. Distribution of RTA cases according to sex and residential area**

Sex	Frequency		Residential area	Frequency	
	No.	%		No.	%
Male	612	82.26	Rural	512	68.82
Female	132	17.74	Urban	232	31.18
Total	744	100%	Total	744	100%

**Table- 2. Distribution of RTA cases according to age**

Age Group	RTA cases	Percentage
0 -10	37	4.97
11-20	104	13.98
21-30	267	35.89
31-40	193	25.94
41-50	87	11.69
51-60	38	5.11
> 60	18	2.42
<b>Total</b>	<b>744</b>	<b>100%</b>

**Table-3. Distribution of RTA cases according to occupation**

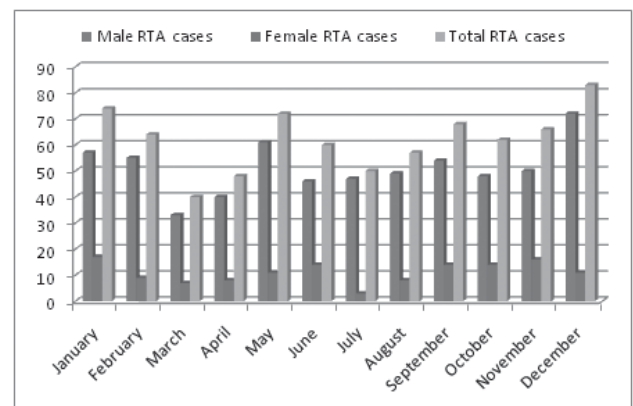
Occupation	RTA cases	Percentage
Agriculture	461	61.96
Government Job	90	12.09
Private Job	85	11.42
Business	73	9.81
Unemployed	35	4.70
<b>Total</b>	<b>744</b>	<b>100%</b>

The RTA cases were divided according to the time of accidents. It was found that maximum 291 (39.11%) RTA cases occurred between 12PM-6 PM followed by 277 (37.23%) cases between 6 PM -12 AM. The least cases 53 (7.12%) were seen between 12AM-6AM (Table-4).

**Table-4. Distribution of RTA cases according to time of accident**

Time of accident	RTA cases	Percentage
12 AM - 6 AM	53	7.12
6 AM-12 PM	123	16.53
12 PM -6 PM	291	39.11
6 PM-12 AM	277	37.23
<b>Total</b>	<b>744</b>	<b>100%</b>

The RTA cases were categorized according to months. It was observed that most of the RTA cases 83 (11.15%) occurred in the month of December and the least cases 40 (5.37%) occurred in the month of March (Figure- 1).



**Fig. 1. Distribution of RTA cases in different months**

In the present study 154 (20.69%) RTA cases were under the influence of alcohol. 115 (15.45%) RTA cases that were under the influence of alcohol were driving motorized two wheelers. Amongst the RTA cases which involved motorized two wheelers, 35 cases occurred due to hit with animals like wild pig at night hours and 21 due to hit to tree. In RTA cases due to three wheelers, overturning of autorickshaw was responsible for RTA in 19 cases.



The road users involved in these accidents were drivers 233 (31.32%), occupants 347 (46.64%) and pedestrians 164 (22.04%). Amongst the drivers of different types of vehicles 143 (61.27%) were motorized two wheeler drivers followed by drivers of three wheelers 32 (13.73%). The least involved were drivers of bus. The occupants of motorized two wheelers 119 (34.29%) were the highest number of victims involved in RTA followed by occupants of three wheelers 103 (29.68%). The least involved were occupants of bicycle. The total numbers of vehicles involved in RTA were 970, since in RTA more than one vehicle may be involved. There were 328 (33.81%) motorized two wheelers involved and the least were bullock cart 23 (2.37%) (Table- 5).

**Table-5. Different types of drivers, occupants and vehicles involved in RTA**

Type of vehicles	Drivers		Occupants		Vehicles	
	No.	%	No.	%	No.	%
Bicycle	30	12.88	0	0	33	3.40
Motorized two wheelers	143	61.27	119	34.29	328	33.81
Three wheelers	32	13.73	103	29.68	208	21.44
Bus	0	0	9	2.59	48	4.95
Truck	1	0.43	23	6.63	108	11.13
Car, Jeep, Van	9	3.86	44	12.68	140	14.43
Tractor	12	5.15	32	9.22	82	8.45
Bullock cart	6	2.58	17	4.90	23	2.37
Total	233	100%	347	100%	970	100%

## DISCUSSION

In the present epidemiological study males are commonly involved RTA victims as compared to females. Moreover, most of the RTA victims were in the age group 21-30 and 31-40. The age group 21-40 is more active, mobile and productive age group. Hence more commonly involved in RTA whereas less than 10 years and above 50 years age group is least affected due to less mobility and less use of vehicles. The males are more exposed to RTA than female as the accident rates were 4.6 times higher in males than in females in the present study and this might be due to increase exposure and risk taking behavior in males whereas females are more commonly confined to their houses. The predominance of males was also observed by others. Esiyok et al.<sup>4</sup> in a study conducted in Turkey reported that 65% of males were RTA victims and mean age of the cases was 33.11 year .The maximum number of RTA cases occurred between 20-30 years of age and 85% of victims were male in study conducted in Mangalore and in another study done in western Maharashtra.<sup>5,6</sup>

People from rural areas were more exposed to RTA than urban area. Rural population with agriculture as

the occupation is more in the present study and these peoples are mostly illiterate, unaware about the traffic rules and in addition to this infrastructure facility is poorly built. These peoples are more mobile in the village setup. They have to travel for the works related to agriculture hence more likely to meet with accidents. Similar finding is seen in a study conducted by Khan MH<sup>7</sup> in Pakistan who found that 93(62%) of the victims belong to rural area and 57(38%) from urban area. Jha et al.<sup>8</sup> in a study conducted in Nepal reported that laborers 28% and students 24% were RTA victims whereas peasant farmer group 16% were RTA cases by occupation in study done in Kampala Uganda.<sup>9</sup>

It was found that the peak time of RTA cases occurred during 12PM- 6PM and 6PM-12AM. These may be due to increase activity on road during day time and drinking of alcohol in night hours. Study by Harnam singh<sup>10</sup> reported that peak time of occurrence of accident was 8-10 AM in the urban setup of Rohtak.

In the present study most of the RTA cases reported mainly in the month of December and least cases in the month of March. The climatic condition of Adilabad is such that winters are cold and summers are extremely hot and December is the coldest month.<sup>3</sup> The foggy condition in the village side may lead to obstruction of vision during winters resulting in increased RTA cases whereas due to excessive increase in the temperature people avoid travel in summers. In one of the study conducted in Mangalore maximum number of cases occurred in rainy season whereas in another study conducted in Rohtak Haryana most cases reported in winter season.<sup>5,10</sup> Jha et al.<sup>8</sup> found that RTA cases in Nepal were more in July.

In the present study pedestrians were the most to get involved in RTA followed by motorized two wheeler drivers .Motorized two wheeler and three wheelers were the vehicles to get commonly involved in RTA. This could be attributed to the less stability of the vehicle and higher speed which can be achieved over shorter distance. The increase RTA cases amongst two wheelers and three wheelers in the present study could be due to the fact that moped, motorcycles and autorickshaw is the most commonly used mode of transportation in rural setup. These being due to dearth of public transportation in villages hence rural people prefer to have their own vehicles. Secondly most of the unemployed youth from villages had owned three wheelers like autorickshaws to earn their livelihood. Moreover the common mode of sustaining accidents was fall from bike since these peoples are less aware of traffic rules and they have casual attitude towards obtaining license. The susceptible young RTA victims driving during night hours were under alcohol influence. It is easy to obtain handmade or country

liquor in villages. The association between alcohol and causation of vehicular accidents both fatal and non fatal is well established.<sup>11</sup> In the study by Wong ZH et al.<sup>12</sup> fatalities involving two wheeler ranked the highest in RTA cases in Singapore. Michael Fitzharris et al.<sup>13</sup> found that 48% of motorized two wheelers, 26% pedestrians and 11.3% three wheelers were the RTA victims in study conducted in Hyderabad city.

In the present study RTA affected more commonly younger generation who is the bread earner for their family hence it results in economic loss for the family as well as to the society. Various measures can be undertaken to prevent road accidents. This includes proper maintenance of roads, widening of roads, regular maintenance of vehicles and avoiding overcrowding of vehicles, use of safety measures like seat belts and helmets, administrative measures like enforcing traffic rules strictly, proper legislation to avoid drunken driving, mandatory use of driving license, issuing license after strict testing of driving skills and emergency medical care on highways.

Thus RTA is found to be associated with several human and environmental factors. If these factors could be controlled then the morbidity and mortality of RTA can be prevented.

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# Impact of Regular Physical Exercises on Body Mass Index and Ocular Health

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## ABSTRACT

The purpose of this study was to assess the relation of regular physical exercise program on body mass index (BMI) and its effect on ocular health represented as intraocular pressure (IOP).

This study was designed to assess the relation of regular physical exercise program on body mass index (BMI) and its effect on ocular health represented as intraocular pressure (IOP).

**Materials and Methods:** Fifteen subjects were enrolled in the study with mean age  $41.7 \pm 3.4$ , who underwent a physical training program on stationary bicycle for 30 minutes, 3 times/week for 3-months. Body mass index and intraocular pressure were measured before starting the program and 3-months after. IOP was measured pre-exercise, immediately after exercise, after 30 minutes and after each month also.

**Result:** Statistical analysis of the results showed that, there were significant decrease in BMI, and IOP. For IOP the significant decrease was obvious after 30 minutes after exercise especially after 2-months and 3-months of training.

**Conclusion:** Therefore exercise that causes reduction in BMI is associated with reduction in IOP declared the healthy ocular status and preservation of regular blood flow to the eye.

**Keywords:** Exercise, BMI (Body mass index), IOP (Intraocular pressure).

## INTRODUCTION

Exercise is known to induce blood flow changes in all organs in the body, including the eye and the brain that are auto regulated in order to maintain a constant blood supply in the face of metabolic stress or imbalance. Blood flow auto regulation refers to the ability of the vascular bed to maintain a relatively constant flow despite moderate alterations in the perfusion pressure, or in terms of eye, ocular perfusion pressure. Exercise, by its very nature, leads to increase in systolic blood pressure and decrease in the Intraocular Pressure (IOP). These two components are strongly influenced by the autonomic nervous system, and the result is an increase in ocular perfusion pressure. A normal healthy eye can cope with the stress and altered ocular perfusion pressure, while the diseased eye, or the eye whose vasculature is compromised by a pre-existing systemic state, may not<sup>1</sup>.

One of the factors that have been investigated for the study of variables that cause change in IOP is obesity

or the change in Body Mass Index (BMI). Obesity is a strong risk factor for hypertension and diabetes mellitus. A study done by cross-sectional data demonstrated that BMI was significantly correlated with IOP after adjusting for age, gender, Systolic Blood Pressure (SBP) & Diastolic Blood Pressure (DBP). In addition, the longitudinal results provided evidence that, among the factors studied, the strongest relation existed between change in IOP and change in weight and change in weight was an independent risk factor for increase in IOP<sup>2</sup>.

A research study by Brownlee et al.,<sup>3</sup> claimed that exercise could decrease IOP and increase pulsatile ocular blood flow as they carried out a study to evaluate the effect of moderate exercise over a short duration on intraocular pressure and pulsatile ocular blood flow. Thirty-one subjects ranging in age from 20-60 years old had measurements of IOP and pulsatile ocular blood flow before and after pedaling on a stationary bicycle for 10 minutes. Measurements were taken with an Ocular Blood Flow Analyzer™ Tonograph. IOP was

significantly reduced, and pulsatile ocular blood flow was significantly increased, following moderately intense exercise. There is some evidence suggesting that regular exercise can reduce eye pressure on its own, and can also have a positive impact on other glaucoma risk factors, including diabetes and high blood pressure.

Nevertheless, the long-term effects of acute sub maximal exercise on IOPs of right-and left-eyes and recovery times to basement levels of IOP in post-exercise periods in Twenty-five sedentary and physically fit subjects ranging in age 17 to 22 years were investigated. IOP were measured by a pneumotonometer. Measurements were taken in the morning at about nine (at rest) and immediately, 30 min and 2 h after acute sub maximal exercise. In sedentary subjects, IOPs of both right- and left-eyes decreased immediate after exercise, but, these decreases in both eyes continued 30 min and 2 h after exercise. In physically fit subjects, IOPs of both right- and left-eyes increased immediate after exercise, but decreased after 30 min exercise compared to basement levels, and this decrease continued 2 h after exercise. Acute sub maximal exercise decreased IOPs of right and left eyes over a period 2 h in sedentary and physically fit subjects. These results suggest that exercise can be used in ocular hypertension treatment <sup>4</sup>.

*Normal Tension Glaucoma* (NTG), also known as low tension or normal pressure glaucoma is a form of glaucoma in which damage occurs to the optic nerve without eye pressure exceeding the normal range. In general, a "normal" pressure range is between 10-20 mm Hg. The causes of NTG are still unknown. For some reason, the optic nerve is susceptible to damage from even the normal amount of eye pressure. Most doctors treat normal tension glaucoma by reducing the eye pressure as low as possible using medications, laser treatments and filtering surgery <sup>5</sup>.

The optometrist evaluates the optic nerve and grades its health by noting the cup to disc ratio. This is simply a comparison of the cup (the depressed area in the centre of the nerve) to the entire diameter of the optic nerve. As glaucoma progresses, the area of cupping, or depression, increases. Therefore, a patient with a higher ratio has more damage <sup>6</sup>.

All tissues and systems of the human body have been shown to be responsive to programmes of exercise and the eye is no exception. While the intraocular pressure lowering effect of exercise is beneficial, the hemodynamic alterations, particularly in diseased eyes where auto regulation is deficient, may exacerbate visual symptoms. Consequently, optometrists and ophthalmologists should be aware of the pros and cons of exercise, and some extreme sports, on the healthy and diseased eye <sup>1</sup>.

Overall, exercise has been found to lower IOP. Studies also have found that it improves blood flow to the retina and optic nerve. In one study, jogging for 20 minutes lowered IOP by 1 mm Hg to 8 mm Hg. In another, weight lifting also led to decreases in IOP, with IOP dropping by 14.5% after the third set of chest presses and 13.2% after the third set of leg presses. While the jogging and weight training studies were conducted in healthy, athletic people without glaucoma, exercise has also been found to benefit sedentary people with ocular hypertension. For instance, three months of moderate exercise for nine sedentary people suspected of having glaucoma decreased mean IOP by 4.6 mm Hg (20% for these particular patients). Simply going for a walk three or more times a week is all you need to protect against glaucoma progression <sup>7</sup>.

Several studies search the effect of different modes and types of exercises on IOP in healthy and diseased eyes and its effect on the ocular health and overall quality of life on those subjects. The results came hopeful that certain exercises not all have good effect on IOP not only in the healthy subjects but also on patients. Intraocular pressure is known to be responsive to the effects of physical exercise. This is usually reflected as a decrease in IOP immediately following exercise, with gradual return to the pre-exercise level over the next one-to-the hour period. A study on the effect of cycling on 10 hypertensive patients has concluded that IOP decreased with exercise and the patients may benefit with better perfusion of the retina <sup>8</sup>.

## MATERIALS AND METHOD

### Subjects

Fifteen subjects were enrolled in that study with mean age  $41.7 \pm 3.4$  and were chosen from the employees of the Faculty of Physical Therapy, Cairo University. With exclusion criteria that, subjects with systemic hypertension (defined as systolic blood pressure > 145 mmHg, diastolic blood pressure > 90 mmHg), and subjects with glaucoma & Diabetes Mellitus.

### PROCEDURE

The participant underwent assessment in the form of weight and height by using weight and height scale to calculate the BMI ( $\text{Kg}/\text{m}^2$ ) and IOP (mmHg) for both eyes using Schiottz tonometer –Improved (SK Speidel & Keller (® 0123) (made in Germany) and were taken pre-exercise, Immediately after exercise and after 30 minutes. These assessments had been done at baseline and after each month till the end of training.

All the subjects were trained by pedaling on stationary bike of 10 Kg. for 30 minutes in the form of 5

minutes warming up and another cooling down with an active exercise period of 20 minutes, with frequency 3 times per week for 3-months.

### STATISTICAL ANALYSIS

Data were analyzed by using a Statistical Package for Social Sciences (SPSS) version 0.8. Descriptive analysis for age, weight and height were represented as mean and standard deviation. The parametric data were analysed by using Paired t-test and the non-parametric data were analysed by using Friedman test that have repeated measures at one time. Body Mass Index (expressed in Kg/ m<sup>2</sup>) was analysed throughout the study at baseline, after 1-month, after 2-months and after 3-month and expressed with a level significance at p<0.05. The statistical analysis for IOP (expressed in mmHg) was analysed by using Friedman test that analysed repeated measures at pre-exercise, immediately after exercise and after 30 minutes throughout the course of the study to denote the best time for IOP adjustment. Also the correlation between IOP and BMI throughout the study using correlation coefficient to declare the relation between both factors.

### RESULTS

Subjects (9 men & 8 women) criteria included at baseline for age, weight and height were presented in table 1.

For the Body Mass Index the results showed that there was significant reduction at p<0.05 in BMI with the training program especially after two and three months of training that was represented in Fig. 1 .

Considering the average intraocular pressure throughout the course of the study there was significant decrease in IOP at the period after 30 minutes of exercise in the first and second month of training as well as the pre-exercise, immediately and after 30 minutes in the third month of training as represented in Fig. 2.

In addition the results showed that body mass index is directly related to intraocular pressure as shown in Fig. 3.

Table 1. Subject criteria at baseline.

	Intervention Subjects Mean ± SD
Number & Sex	15 subjects (9 male & 8 female)
Age (years)	41.7±3.4
Weight (Kg)	79.5 ± 10.6
Height (cm)	161.95 ± 5.7

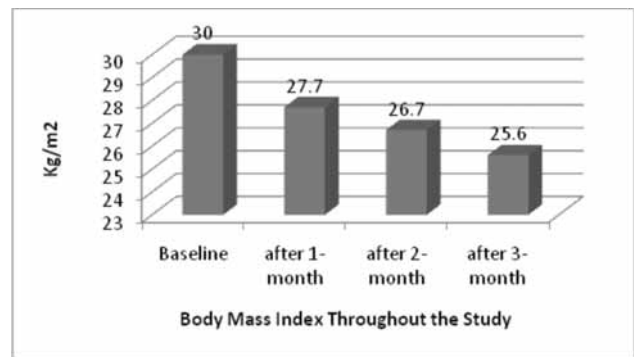


Fig. 1 Body Mass Index Throughout the study.

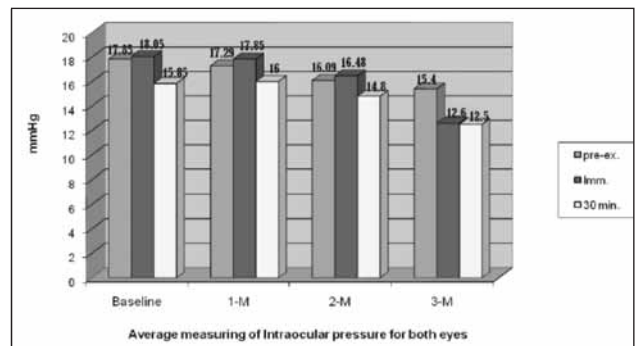


Fig. 2 Average Intraocular pressure for the intervention group throughout the course of the study.

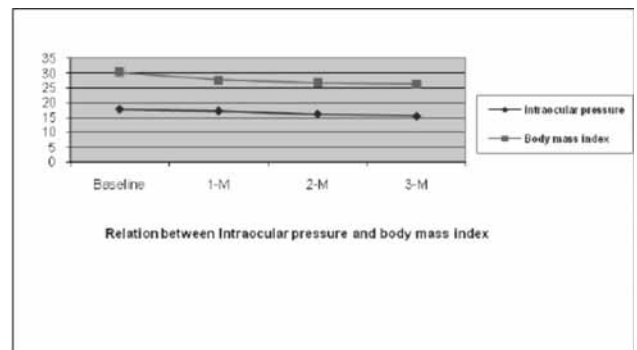


Fig. 3 Correlation between Intraocular pressure and body mass index throughout the course of the study.

### DISCUSSION

According to the results shown in this study that came coincided with several studies that confirm that regular exercise can enhance the release of nitric oxide (NO) that leads to a functional consequence of the good nourishment of the delicate and sensitive tissues to blood deprivation such as EYE and normalize intraocular pressure that will save it from ocular complications as diabetic retinopathy (DR) which is the major cause of blindness in adults aged 25-74 years<sup>9</sup>.

In support with Kozobolis et al.,<sup>10</sup> who studied the effects of maximum dynamic physical exercise on ophthalmic artery (OA) blood flow and ocular perfusion pressure (OPP) on thirty male subjects and concluded that maximal physical exercise increases OPP and blood flow at the OA implying that auto-regulative mechanisms are active in both retinal and choroidal

In addition, the effects of the intensity, duration and quantity (intensity x duration) of exercise on the reduction of intraocular pressure (IOP) in healthy and physically fit individuals were studied. After 15 minutes of exercise at 70%, 55% and 40% of maximum exercise load (%HRmax) the IOP decreased 4.3 +/- 0.7 mmHg, 2.2 +/- 0.7 mmHg and 0.6 +/- 0.5 mmHg, respectively. The magnitude of IOP reduction increased with exercise load<sup>11</sup>.

Running for 7.5 minutes at 70%HRmax decreased IOP comparable to 15 minutes of running at the same exercise load (4.4 +/- 0.6 mmHg). Twenty-five minutes of running at 40%HRmax is almost the same quantity of exercise as 15 minutes of running at 70%HRmax. However, the former did not result in IOP reductions to equal the latter (2.3 +/- 0.5 vs. 4.4 +/- 0.6 mmHg). The amount of IOP reduction after short-term exercise seems to depend on the intensity of exercise, not on the duration of exercise or the quantity of exercise<sup>12,13</sup>.

The results agreed with the outcomes shown by Qureshi et al.,<sup>14,15</sup> regarding the relationship between physical fitness and intraocular pressure (IOP). Exercise program for 10 weeks showed a marked increase in physical fitness and reduction in IOP. As well as the intensity of exercise is responsible for the magnitude of the initial IOP decrease after short-term exercise. Furthermore, it seems that other factors such as duration of exercise or quantity of exercise, blood pressures, body mass index are not related to the amount of the initial fall in IOP.

In contrast, previous studies have shown a reduction in intraocular pressure (IOP) from many means of exertion, ranging from walking to exhausting exercise in both normal and glaucoma subjects. The effects of walking, jogging, and running fast until exhaustion on IOP were noted in seven normal and seven open-angle glaucoma subjects. Intraocular pressures were measured with the Goldmann applanation tonometer during and after exercise. After 5 min of walking and jogging, in all subjects, IOP decreased significantly (by 56 to 61% of total decreases). Glaucoma patients had a greater drop and longer duration of post-exercise recovery as compared to normal subjects. It would seem reasonable, at present, not to discourage patients who have glaucoma from light exercises such as walking; perhaps, on the contrary, it should be encouraged<sup>16</sup>.

The outcomes of study that examined the effects of 20-minutes of jogging (sub maximal—70%—aerobic exercise) on intraocular pressure (IOP), blood pressure (BP), and heart rate (HR) on twenty-nine healthy individuals-25 athletes and 4 untrained. The results showed that IOP decreased (1 to 8 mmHg). BP increased (systolic: 0 to 60 mmHg, diastolic: 0 to 15 mmHg). HR increased as well (15 to 80 pulses/min). IOP decreases all after the jogging<sup>17</sup>.

Researchers found that regular physical exercise can reduce IOP by as much as 4 mmHg; where this reduction may be enough to protect the retinal ganglion from damage. In addition to the acute-phase IOP lowering effect of exercise, consistent exercise programs decrease ocular pressure in long term<sup>1</sup>.

Although there are many exercises that reduce IOP, there are also exercises that have the adverse affect that increases IOP as Weight Lifting. In Brazil researchers have found that weight lifting maneuvers such as bench presses can temporarily boost IOP and increase risks associated with glaucoma, which can damage the eye's optic nerve. Prolonged weight lifting could be a potential risk factor for the development or progression of glaucoma<sup>18</sup>.

According to, Kinshuck,<sup>11</sup> exercise lowers the eye pressure 1mmHg. A 1mmHg reduction in pressure will cause a 10% reduction in loss of visual field. Thus exercise would be expected to result in a 10% reduction in the progression of glaucoma. Moreover aerobic exercise can reduce intraocular pressure by 4 to 6 mm Hg. Brisk walking is a favorite activity of many people. Other exercise to consider is swimming, aerobics, and cycling. Moderate exercise improves cardiovascular system, helps keep off extra pounds as reducing body weight (BMI), lowers cholesterol, reduces high blood pressure and improves retinal circulation. Exercise also helps to improve mental outlook and reduces stress. These factors are important in helping the body fight disease. Together with avoiding obesity, exercise will help to prevent at least 50% of type 2 diabetes.

In addition many studies cleared the relation between the increasing of BMI and the existence of hypertension as well as the strong bond between blood pressure and IOP explained the decreasing of these factors with exercise which ensured a healthy ocular status of the eye<sup>19</sup>.

Increasing levels of physical activity, together with reduced sodium intake and weight loss, are therapeutic lifestyle changes known to effectively reduce blood pressure, regular aerobic exercise in obese and hypertensive individuals has been associated with an average 4.1 to 2.9- mmHg falls in blood pressure<sup>20</sup>.

## CONCLUSION

**Exercise by different means that influence reduction in body weight will also influence blood fat levels, lowers triglycerides, and increases high density lipoprotein(HDL) leading to lowering of blood pressure that have a great impact with IOP and ocular health in general.**

## Conflict of interest/sponsorship

There is no conflict of interest or sponsorship.

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# Clinical Applications & Efficacy of Latissimus Dorsi Muscle and Myocutaneous Flap - A Hospital Based Study

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## ABSTRACT

The Latissimus dorsi muscle is a large, flat muscle that covers the inferior half of the posterior trunk. This is a retrospective analysis of a prospective study in which 23 patients (n=23) were studied after having informed consent from the patient or attendants or both. The data collection & storage was done on pre-formed working Performa sheets. Results were analyzed. It was found that when used as free flap or pedicled flap Latissimus dorsi can cover extensive and distant defects without obvious donor site loss of function. The Latissimus dorsi muscle and myocutaneous flap in pedicle or free flap form has provided a consistently reliable method of reconstruction of head and neck, upper limb, lower limb, chest, abdomen, breast, myelomeningocele. This study is an attempt to study the clinical applications of Latissimus dorsi muscle and myocutaneous flap and to determine the safety and efficacy of this flap.

**Keywords:** Myocutaneous flap, Latissimus dorsi flap, Reconstruction.

## INTRODUCTION

The latissimus dorsi, meaning 'broadest muscle of the back' (Latin *latus* meaning 'broad', *latissimus* meaning 'broadest' and *dorsum* meaning the back), is the larger, flat, dorso-lateral muscle on the trunk, posterior to the arm, and partly covered by the trapezius on its median dorsal region. The latissimus dorsi is responsible for extension, adduction, horizontal abduction, flexion from an extended position, and internal rotation of the shoulder joint.<sup>[1, 2, 3, 4, 5]</sup> It also has a synergistic role in extension and lateral flexion of the lumbar spine. This study is being conducted to study the clinical applications of Latissimus dorsi muscle and myocutaneous flap and to determine the safety and efficacy of this flap.

## STUDY OBJECTIVES/AIMS

In this study, our study objectives/ aims were –

- (1) To study the clinical applications of Latissimus dorsi muscle and myocutaneous flap.
- (2) To determine the safety and efficacy of this flap.

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## MATERIAL & METHOD

This is a retrospective analysis of a prospective study conducted during August, 2008 to July, 2011 (3 years) in C.S.S.H. Hospital attached to Subharti Medical College, Meerut, U.P., INDIA after taking permission from the institutional ethical committee. The present work is based upon a study of 23 patients who underwent reconstruction during the study period in Department of General Surgery, Subharti Medical College, Meerut. The study was carefully and meticulously performed and an attempt made to cover every possible aspect. Patients were admitted through plastic surgery outpatient department or referred from orthopedics department. Flap selection was done regarding size, site, shape of defect, status of surrounding tissue, presence of external fixator, mobility of different joints and patient comfort. The cases included here belonged to different age groups and both sexes.

## Inclusion Criteria

1. The patients must have functional Latissimus dorsi muscle.
2. The muscle should be expendable.
3. The donor site effect should be acceptable to all patients.



**Exclusion Criteria:**

1. Patient having previous posterolateral Thoracotomy scar.
2. Poliomyelitis victims (in whom it may be the only lateral muscle capable of elevating the pelvis for a forward step).

**Indications:**

The present work included cases mostly following -

- 1) Trauma
- 2) Burn.

The Clinical study was done under following headings-

1. History- Careful relevant history taken and recorded on preformed working performa.
2. Physical examination- including general examination, examination of local Part.
3. Investigation
  - a. Laboratory Investigation
  - b. Radiological study
  - c. Hand Doppler
  - d. Angiography
4. Orthopaedic management- regarding fixation of the fracture site and vascular reconstruction.
5. Surgical management- The operation was taken in general anaesthesia in semiprone position. Prophylactic antibiotics and post operative immobilization was used in all patients .Blood transfusion was instituted when necessary. In, cases of free flaps, 1- 0 polyamide monofilament 4 mm 3/ 8 circle round bodied micropoint suture was used.
6. Result evaluation was done taking flap survival, aesthetic and final results, donor site morbidity and patient satisfaction.
7. Postoperative management: - Aspirin was continued for 2 weeks and low molecular weight dextran-40 was given for 3 days where free flap was done for reconstruction.<sup>[6, 7, 8, 9]</sup> A careful study of postoperative management was done. Complications regarding donor and recipient sites were recorded and managed accordingly.

**Follow up:** - Necessary rehabilitation for functional and aesthetic debility was provided at follow up.

Physiotherapy was given regarding gradual weight bearing in case of lower limb recipient site and range of motion of adjacent joint. Debulking of flap was done as required.

**OBRERVATION**

There were 21 males ((91.3%) and 2 females (8.6%) in the series. All the patients were operated as elective except 5patients who were operated on emergency basis. The minimal age was 5 years and maximum age was 65 years, most common age group requiring flap coverage was between 21 to 30 years (34.7%).

Most common indication for flap coverage was post traumatic road traffic accident - 18 patients(78.2%); train accident and Occupational hazard - 2 patients each (8.6%) and Electric burns - 1 patient (4.3%) . Post traumatic defect with exposed bone with or without fracture site was seen in 17 (73.9%) cases, post traumatic defect with exposed vessel/ graft seen in 3(13%) cases, post traumatic defect with exposed bone & exposed joint in 2(8.6%) cases and post burn defect with exposed bone in 1(4.3%) case.

All 15 free flaps (65.3%) were myocutaneous, 7(30.4%) pedicle flaps were myocutaneous and one (4.3%) was muscle flap (Table-1). All 23 patients were operated under general anesthesia and sustained anesthesia well. Operation time was 6 hours to 8 hours

**TABLE 1. Distribution of flap according to site and type of flap**

Sites	Pedicle Flap (n=8)	Free Flap (n=15)
Arm	4 (50%)	
Arm + Elbow	2 (25%)	
Elbow	1 (12.5%)	
Forearm		1 (6.7%)
Thigh		1 (6.7%)
Thigh + Leg		1 (6.7%)
Leg + Foot		5 (33.3%)
Leg		1 (6.7%)
Foot		6 (40%)
Back	1 (12.5%)	

In 15 patients (65.2%) where free flap was done, end to end anastomosis was done between Anterior Tibial artery in 9 patients (60%) and in 4 patients with Posterior Tibial artery, where end to side arterial anastomosis was done. One patient (6.7%) required anastomosis with descending branch of Lateral circumflex femoral artery in end to end fashion .In another patient (6.7%) anastomosis was made with Ulnar artery end to end to cover the defect in forearm. Venous anastomosis was done end to end in all cases.

Hand Doppler was used to ensure the patency of vascular axis in all the patients. Angiography was done in 2 cases, one having defect on posterior aspect of thigh with unstable fracture and in another patient who had defect on anteromedial aspect of foot extending to lower leg.

Donor site was primarily closed in 21(91.3%) cases and 2 cases (8.6%) required split thickness graft. Complete Flap survival was seen in 12 cases (80 %) of the free flap cases and 6 cases (75 %) of the pedicled flaps.

**DISCUSSION**

In the series of 24 cases by R.C. Russell<sup>[10]</sup> et al (1986) ,80 % reported no significant problem or changes in daily living activities while 17 % noted difficulty in putting on panty hose, getting into or out the bath tub or sleeping on the donor site. Muscle strength testing revealed mild/moderate loss of motion and strength after mean follow up of 16 months. Relative weakness tends to diminish as the follow up period was prolonged. They determined that operated shoulder was 34% weaker than the non- operated side in 73% patients. However majority of patients experienced some social change regarding their occupation, household activities or activities of daily life.

**Laitung and Peck<sup>[11]</sup> (1985)**, in their study found no statistically significant difference in power in patients and control groups, when dominant and nondominant sides were considered separately. 60 % patients reported subjective difficulty in performing activities of daily life and no patient had any occupational difficulty related to muscle transfer. The loss in clinical terms appeared to be minimal to the investigators.

**Inger M Nielson<sup>[12]</sup> et al (1985)** reported no permanent functional loss at the donor site in their series. Direct closure of donor site seemed cosmetically preferred despite the fact that scar appeared rather bad. **When the donor area was split skin grafted, main drawback was cosmetic. John Bostwick<sup>[13]</sup> et al (1979) observed that the donor defect was acceptable to all patients when closed primarily.**

James W May<sup>[14]</sup> et al (1984) in their series observed that most patients noted numbness over the skin of their resected Latissimus muscle but in no patient was this a significant problem. There was no noticeable functional difference between 30 patients with full Latissimus dorsi muscle transfer and the 5 patients with hemilatissimus transfer. The aesthetic asymmetry noted from removal of Latissimus dorsi was less apparent in women than in men, but was much less apparent in both groups than transfer of the muscle with skin as seen when this unit moved as a combined transfer.

Brumback<sup>[15]</sup> et al (1992), in their series reported that none of the patients noted any change in the activities of daily life with regard to shoulder function. Only 1 patient described soreness of the donor shoulder, following work performed with arms over the head. Passive range of motion was not reduced in these patients.

Scott L. Spear and Christopher L. Hess<sup>[16]</sup> (2005), reviewed the functional and biomechanical changes in the shoulder. They stated that it was not the loss of power, but a more rapid onset of fatigue during prolonged activities like swimming, ladder climbing and overhead painting.

Present study can be compared with previous studies in the following manner -

**TABLE 2. Distribution of patients according to their complaints during follow up period.**

Complaints	Present study (n=13)	William P Adams <sup>[17]</sup> et al (2004)(n=36)
Subjective donor site shoulder weakness (Moderate)	2	8
Subjective donor site shoulder weakness (mild)		14
Thick Flap	1	
Numbness	0	18

**TABLE 3. Distribution of cases according to time taken by patients to return to job.**

Complaints	Present study (n=13)	William P Adams <sup>[17]</sup> et al (2004)(n=36)
<1	6(46.1%)	25 (69.4%)
1-3	2(15.3%)	11(30.6%)
>3	3(23%)	

**TABLE 4. Distribution of cases according to self related Donor site cosmesis.**

Complaints	Present study (n=13)	William P Adams <sup>[17]</sup> et al (2004)(n=36)
Good	14(38.9%)	10(76.9 %)
Average	14(38.9%)	1(7.6%)
poor	8(22.2%)	2(15.3%)

**Follow up:** Of the 23 patients in this study, 13 (56.5%) patients turned back for follow up. Eight patients (61.5%) were treated for lower limb reconstruction, 4 patients (30.7%) were treated for upper limb reconstruction and 1 patient (7.6%) managed for defect on upper back. They were evaluated for weight bearing and mobilization and range of motion of

adjacent joint at the recipient site and self related cosmesis at donor and recipient sites.

### SUMMARY & CONCLUSION

1. The present study was undertaken to analyze the clinical applications, safety & efficacy of Latissimus dorsi muscle and myocutaneous flap.
2. When used as free flap or pedicled flap Latissimus dorsi can cover extensive and distant defects without obvious donor site loss of function.

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**Conflict of Interest:** Nil

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# Correlation between High Myopia and Primary Open Angle Glaucoma in a Population of Greater Noida, Uttar Pradesh: A Prospective Study

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## ABSTRACT

Primary open angle glaucoma is one of the leading causes of irreversible but preventable blindness in the population above the age of 40 years. This study was conducted to find out correlation between high myopia and primary open angle glaucoma with a view to ascertain whether high myopic (>9 D) patients above the age of 40 years were at a higher risk of developing primary open angle glaucoma (POAG).

The present study was carried out on 84 eyes of 53 high myopic patients. It was found that there was a definite correlation between high myopia and primary open angle glaucoma patients. The incidence of primary open angle glaucoma was 19.05 %, whereas in glaucoma suspect cases, it was 13.09 %. The incidence of primary open angle glaucoma was clearly associated with refractive state and increased gradually with the increase in severity of myopia. We also found a significant correlation between mean axial lengths & mean intraocular pressure and correlation between mean axial length & mean cup disc ratio of all myopic eyes. The gross appearance of the highly myopic eyes was oval or egg shaped, it was enlarged, but the elongation of the eyes was almost entirely confined to the posterior pole, the anterior half of the globe was usually normal.

**Keywords:** Open Angle Glaucoma, Myopia, Intraocular pressure, Axial Length, Cup-disc ratio

## INTRODUCTION

Primary open angle glaucoma is one of the leading causes of irreversible but preventable blindness in the population above the age of 40 years. The myopic eye is particularly sensitive to the effects of raised intraocular pressure. Patients with primary open angle glaucoma and high myopia had a high risk for subsequent visual field loss.

This study is intended to examine the eyes of individuals above 40 years of age with high myopia (>9 Diopter) to find out correlation with primary open angle glaucoma and to confirm whether they are more prone to develop primary open angle glaucoma or in what way high myopic eyes with primary open angle glaucoma are structurally different from normal high myopic eyes.

An attempt was made to find out any significant anatomical disparity between the two which might explain the reason why some myopic eyes develop primary open angle glaucoma while others do not. We also tried to find out the ways for early detection of primary open angle glaucoma in high myopes who are

at very high risk of developing primary open angle glaucoma.

## MATERIALS & METHOD

This is prospective study, conducted in the Department of School of Medical Sciences, Sharda University Greater Noida (UP) India from 1 June 2009 to 30 October 2010. In this study patients of either sex above 40 years of age belong to rural or urban area, having myopia > -9 Diopter attending to the Out Patient Department were included. The study cohort included 84 eyes with high myopia (> -9D) of 53 patients above 40 years of age, who were divided into two groups. The patients having myopia > -9 to -15 Diopter were included in group A, whereas patients with myopia > -16 to -20 Diopter were included in group B. The inclusion criteria were age above 40 years, Myopia > 9D and eyes with open angle. The patients below 40 years, myopia < 9 D, eyes with angle closure, traumatic as well as post operative eyes were excluded from this study. All the selected cases were studied in the following pattern:

### History and General Examination

The following particulars were recorded: name, age, sex, address, date of examination and history of each case was taken carefully in regards to the chief complaints along with the presence of any systemic illness.

After a detailed history and meticulous clinical examination, patients were diagnosed primary open angle glaucoma on the bases of intraocular pressure >21 mm Hg, vertical cup/disc ratio >0.5, a characteristic visual field defect, and positive provocation test. The diagnosis of primary open angle glaucoma was based on at least two of the above four criteria in at least one eye.

Glaucoma suspects were diagnosed on the basis of intraocular pressure >21 mm Hg, appearance of the optic disc suggestive of glaucomatous damage, diffuse or focal narrowing of the disc rim, diffuse or localized abnormalities of the nerve fiber layer especially at superior and inferior poles, disc hemorrhage, asymmetric appearance of the disc between fellow eye (cup/disc ratio difference greater than 0.2) and suspicious visual field for early glaucomatous damage. The diagnosis of glaucoma suspect was based on at least one of the above criteria in at least one eye.

### Ocular Examination

Visual Acuity was recorded., Refraction of both the eyes was done . Then only myopic patients were included in the study. Every patient underwent slit lamp and fundus examination. Intraocular Pressure was carried out with a Goldman’s applanation tonometer. Gonioscopy was done by Goldmann one mirror gonioscope with the help of slit lamp to rule out angle closure. (Schaffer’s method). Diurnal Variation: Four

readings of both the eyes were taken at 8 AM, 12 PM, 4PM and 8 PM of diurnal variations in intraocular pressure of more than 6mm of Hg was taken as suspicious of glaucoma. Provocative Water Drinking Test was done. A Bausch and Lomb Keratometer were used to measure the anterior corneal curvature. Measurement of central corneal thickness was done by ultrasonic pachymeter.

**Automated Perimetry:** Visual field analysis (Central 30-2 threshold test with strategy SITA – standard) was done by Humphreys’ automated field analyzer

**A-Scan Ultrasonography:** Axial length Measurement of eyes was done by A-scan.

**B-Scan Ultrasonography:** B-mode ultrasonography of the eyes was done by using 10 MHz transducer. The eyes were evaluated to find out any significant anatomical disparity between the glaucomatous and non glaucomatous high myopic eyes which might explain the reason why some myopic eyes develop primary open angle glaucoma while others do not.

### OBSERVATION

Table 1: Distribution of Eyes in both Groups of High myopia

Groups	Number of Eyes
A (Myopia >9 - 15D)	63 (75%)
B (Myopia 16-20 D)	21 (25%)
Total	84

The present study was conducted on 84 high myopic eyes (>9 D) of 53 myopic patients, who were subjected to investigations for glaucoma. The cases were divided into two groups as shown in table 1

These eyes were divided into normal, glaucoma suspects and glaucomatous eyes as shown in the table 2

Table 2. Distribution of Normal, Glaucoma Suspects and Glaucomatous Eyes

Groups	Normal eyes	Glaucoma suspect eyes	Glaucomatous eyes	Total
A (Myopia >9 - 15 D)	46 (73.02%)	07(11.11%)	10 (15.87%)	63
B (Myopia 16-20 D)	11(52.38%)	04(19.05%)	06 (28.57%)	21
Total	57 (67.86%)	11 (13.09%)	16 (19.05%)	84

Table 3. Distribution of Mean Applanation Pressure (mm Hg) among Normal , Glaucoma Suspect and Glaucomatous Eyes in Both the Groups of High Myopia

Groups	N	Normal ±SD	N	Glaucoma Suspect ±SD	N	Glaucomatous ±SD	p value
A (>9-15 D.)	46	15.90±1.96	07	19.00±1.83	10	26.20±2.58	0.001
B (16-20D.)	11	16.46±2.59	04	19.00±2.00	06	26.00±2.85	0.001

As shown in Table 3— The mean Applanation pressure of glaucomatous eyes was found significantly

higher (p<.01) than normal eyes and glaucoma suspect eyes.

**Table 4. Distribution of Mean Variation in Intraocular pressure (mm Hg) between Normal and Glaucoma Suspect Eyes after Provocative Test in both the Groups of High Myopia**

Groups	N	Normal $\pm$ SD	N	Glaucoma Suspect $\pm$ SD	p value
A (>9-15 D.)	46	3.36 $\pm$ 0.08	07	5.86 $\pm$ 0.89	0.001
B (16-20D.)	11	3.69 $\pm$ 10.4	04	6.50 $\pm$ 0.58	0.001

As shown in Table 4 — Mean variation in IOP of glaucoma suspect eyes was found significantly higher ( $p < .001$ ) than normal eye

**Table 5. Correlation between Mean Axial Length and Mean Cup Disc Ratio of All Myopic Eyes in both Groups of High Myopia**

Groups	N	Axial Length $\pm$ SD	N	Cup Disc ratio $\pm$ SD	p value
A (>9-15 D.)	63	27.78 $\pm$ 1.24	63	0.44 $\pm$ 0.13	0.001
B (16-20D.)	21	29.44 $\pm$ 1.53	21	0.48 $\pm$ 0.17	0.001

As shown in Table 5 , The correlation was found highly statistical significant ( $p < 0.001$ )

**Table 6. Correlation between Mean Axial Lengths and Mean Intraocular Pressure of All Myopic Eyes in both the Groups of High Myopia**

Groups	N	Axial length $\pm$ SD	N	IOP $\pm$ SD	p value
A (>9-15 D.)	63	27.78 $\pm$ 1.24	63	18.68 $\pm$ 4.01	0.001
B (16-20D.)	21	29.44 $\pm$ 1.53	21	20.42 $\pm$ 4.28	0.001

As shown in Table 6—. This correlation was found highly statistical significant ( $p < 0.001$ )

**Table 7: Distribution of Mean Corneal Thickness ( $\mu$ m) among Normal Eyes, Glaucoma Suspect Eyes and Glaucomatous Eyes in both the Groups of High Myopia**

Groups	N	Normal $\pm$ SD	N	Glaucoma Suspect $\pm$ SD	N	Glaucomatous $\pm$ SD
A (>95 D.)	46	535.47 $\pm$ 28.17	07	534.63 $\pm$ 21.13	10	533.00 $\pm$ 32.14
B (16-20D.)	11	528.42 $\pm$ 21.23	04	525.67 $\pm$ 21.13	06	528.83 $\pm$ 31.78

As shown in Table 7 — There was no significant difference of mean corneal thickness found in between normal eyes and Glaucomatous eyes, Normal eyes and Glaucoma Suspect eyes & Glaucomatous and glaucoma suspect eyes ( $p > 0.05$ )

**Table 8: Distribution of Mean Axial Length (mm) among Normal, Glaucoma Suspect Eyes and Glaucomatous Eyes in both the Groups of High Myopia**

Groups	N	Normal $\pm$ SD	N	Glaucoma Suspect $\pm$ SD	N	Glaucomatous $\pm$ SD
A (>9-15 D.)	46	27.69 $\pm$ 1.28	07	27.94 $\pm$ 1.36	10	28.06 $\pm$ 1.43
B (16-20D.)	11	29.14 $\pm$ 0.70	04	29.86 $\pm$ 1.68	06	29.94 $\pm$ 2.09

As shown in Table 8 and — Mean axial length was slightly more in Glaucomatous as well as in glaucoma suspect eyes as compared to normal eyes but there was no statistical significant difference found between them ( $p > 0.05$ )

**Table 9: Distribution of Mean Horizontal Curvature of Cornea K1 (D) among Normal, Glaucoma Suspects Eyes and Glaucomatous Eyes of both Groups of High Myopia**

Groups	N	Normal $\pm$ SD	N	Glaucoma suspect $\pm$ SD	N	Glaucomatous $\pm$ SD
A (>9-15 D.)	46	44.31 $\pm$ 1.73	07	44.86 $\pm$ 1.16	10	44.90 $\pm$ 1.46
B (16-20D.)	11	43.95 $\pm$ 1.29	04	44.19 $\pm$ 1.50	06	44.75 $\pm$ 1.98

As shown in Table 9 —. Mean horizontal curvature of cornea K1 (D) in between normal, glaucoma suspects and glaucomatous eyes of both groups of high myopia was found statistically non significant ( $p > 0.05$ ).

**Table 10: Distribution of Mean Vertical Curvature of Cornea K2 (D) among Normal, Glaucoma Suspects Eyes and Glaucomatous Eyes of both Groups of High Myopia**

Groups	N	Normal $\pm$ SD	N	Glaucoma Suspect $\pm$ SD	N	Glaucomatous $\pm$ SD	p value
A (>9-15 D.)	46	44.39 $\pm$ 1.56	07	44.82 $\pm$ 1.28	10	44.75 $\pm$ 1.69	0.517
B (16-20D.)	11	44.05 $\pm$ 1.32	04	44.13 $\pm$ 2.00	06	44.29 $\pm$ 2.16	0.778

As shown in Table 10 — Mean vertical curvature of cornea K2 (D) in between normal, glaucoma suspects and glaucomatous eyes of different groups of myopia was found statistically non significant ( $p > 0.05$ ).

**Table 11. Distribution of Disc Changes in Glaucomatous Eyes in both Groups of Myopia**

Groups	Glaucomatous cupping	Nasal shifting of vessels	Localized pallor of rim	Baring of rim vessels	Arterial Pulsations
( Myopia>9-15 D.)	10 (100%)	07 (70%)	03 (30%)	01 (10%)	01 (10%)
(Myopia 16-20D.)	06 (100%)	04(66.67%)	02(33.33%)	01(16.67%)	01(16.67%)

Fundus was examined for all the 84 eyes of 53 patients out of which in 16 glaucomatous eyes various type of disc changes were found. As shown in Table glaucomatous cupping was found in 16 (100%) eyes, nasal shifting vessels in 11 (68.75%) eyes, localized pallor of rim in 05 (31.25%) eyes, , barring of rim vessels in 02 (12.5%) eyes, and arterial pulsation in 02 (12.5%) eyes

**Table 12. Distribution of Type of Field Changes in both Groups of Myopia**

Groups	Normal Fields	Myopic Field Changes	Glaucomatous field changes	Mixed field changes	Total
A (>9-15 D)	34(53.97%)	21 (30.16%)	07 (11.11%)	03 (4.76%)	63
A(16-20D)	03(14.29%)	12 (57.14%)	02 (9.52%)	04 (19.05%)	21
Total	37(44.05%)	31 (36.90%)	09 (10.71%)	07 (8.33%)	84

As shown in **Table 12:** — 37(44.05%) eyes had normal fields, 31 (36.90%) eyes had myopic field changes, 09 (10.71%) eyes had glaucomatous field changes and 07 (8.33%) eyes had mixed (both myopic & glaucomatous) mixed field changes.

### GONIOSCOPY

Gonioscopy was done to rule out angle closure .The angle was found either grade III & IV (Shaffer’s).

### B Scan Ultrasonography

During the B scan it was observed that the gross appearance of the highly myopic eye was characteristic both in size and shape. Instead of being globular it was oval/egg shaped, it was enlarged, but the elongation of the eye was almost entirely confined to the posterior pole, and the anterior half of the globe was usually normal. It was also observed that elongation of the eye increases with the increase of axial length as well as severity of myopia but there was no significant variation seen between the glaucomatous and non glaucomatous eyes.

### DISCUSSION

This study was conducted to find out correlation between high myopia and primary open glaucoma with a view to ascertain whether high myopic (>9D) patients above the age of 40 years were at a higher risk of developing primary open angle glaucoma (POAG).

Also, it was aimed at studying these eyes in detail with better instrumentation, to see if any structural difference could be found between myopic eyes that developed glaucoma and those that did not develop it.

We studied 84 eyes of 53 high myopic patients in detail and following are the important findings:

(1) There is a definite correlation between high myopia and primary open angle glaucoma patients. In this study which included high myopes (>- 9D) above

40 years of age and was hospital based, the incidence of primary open angle glaucoma was found to be 19.05 %.

- (2) Glaucoma suspect cases were found to be 13.09 %.
- (3) The incidence of primary open angle glaucoma was clearly associated with refractive state and increased gradually with the increase in severity of myopia.
- (4) We found a significant correlation between mean axial lengths and mean intraocular pressure of all eyes of both the groups of high myopia. There was a linear increase in intraocular pressure with the increase in axial length as well as severity of myopia.
- (5) We also found a significant correlation between mean axial length and mean cup disc ratio of all eyes of both the groups of high myopia. The ratio tending to be high with the increase in axial length as well as severity of myopia.
- (6) We found that the elongation of the eyes increases with the increase in axial length as well as severity of myopia. There was no significant variation found between glaucomatous and non glaucomatous high myopic eyes.
- (7) There was no significant change in corneal thickness of glaucomatous and glaucoma suspect eyes as compared to normal eyes in both the groups of high myopia.
- (8) There was no significant change in the horizontal as well as vertical curvature of glaucomatous and glaucoma suspect eyes as compared to normal eyes in both the groups of high myopia.

## CONCLUSIONS

Therefore, we conclude that the incidence of primary open angle glaucoma was clearly associated with the refractive state and increased gradually with the increase in severity of myopia. So there is a definite correlation between high myopia and primary open angle glaucoma and myopia is definitely a risk factor in development of primary open angle glaucoma. Structural differences between myopic eyes and eyes which become glaucomatous seem to be mainly due to the long axial length. Intraocular pressure and cup disc ratio increases with the increase in axial length as well as severity of myopia.

## RECOMMENDATIONS

Therefore it is recommended to do glaucoma screening in myopic patients so that glaucoma in such patients can be detected at an early stage before the patient develops obvious glaucomatous damage.

We can increase the detectable rate of glaucoma in high myopia by analyzing the fundus photos, retinal nerve fiber layer analysis with OCT/GDx/HRT and recognizing the early clinical characteristics.

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# Comparison of Bupivacaine alone and its Combination with different Doses of Fentanyl in Spinal Anesthesia for Cesarean Section: A Prospective Randomized Study

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## ABSTRACT

**Background:** Intrathecal administration of local anesthetics alone does not provide adequate analgesia during caesarian sections. The visceral pain associated with peritoneal traction can be obliterated by the addition of intrathecal opioid, due to their synergism.

**Aims:** The aim of this study was to observe the effect of intrathecal bupivacaine alone and in combination with fentanyl in two different doses.

**Settings and Design:** We performed a prospective randomized study on 90 consecutive patients undergoing caesarian section in our hospital.

**Methods and Material:** Ninety selected patients, who underwent cesarean section, of age ranging from 20-35 years, were randomized into three equal groups. Group I received hyperbaric bupivacaine (B) alone, where as group II and group III received hyperbaric bupivacaine along with 12.5 µg and 25 µg of fentanyl respectively (BFL & BFH). The quality and durations of analgesia was compared between the three groups. The effects of drug on neonate were monitored on the basis of Apgar score.

**Statistical analysis:** Unpaired 't' test & 'Z' test were used for statistical analysis.

**Results:** There were no differences in regard to Apgar scores between all three groups. The synergistic advantages were evident in both combination groups with respect to patient's comfort and ease of surgeons; but the maternal side effects were more in the group with higher dose of fentanyl (BFH). No adverse effect on neonates was observed in all three groups.

**Conclusion:** Since the clinical dose of spinal bupivacaine required to obliterate visceral pain causes undesirable side effects. Addition of fentanyl with bupivacaine, reduces the dose of local anesthetics in achieving adequate surgical anesthesia. We conclude that the combination of 12.5 µg of fentanyl along with 2ml of 0.5% hyperbaric bupivacaine achieved adequate anesthesia with minimal maternal and neonatal adverse effects.

**Keywords:** Bupivacaine, Cesarean section, Intrathecal Fentanyl, Spinal anesthesia.

## INTRODUCTION

The easier technique, economy, rapid onset of action and reliability in blocking uniform sensory and motor systems of spinal anesthesia has resulted into the anesthesia of choice for infra umbilical surgery especially caesarean section.<sup>1-5</sup> Another added advantages of spinal anesthesia are high efficiency, involves less drug doses, minimal neonatal depression, awake mother and lesser incidences of aspiration pneumonitis. However, it has some limitations like fixed duration of anesthesia, post-dural puncture headache, hypotension and lesser control of block height and lack of long-lasting post-operative analgesia.<sup>6</sup>

Bupivacaine, a local anesthetic drug belonging to the amino amide group, has high potency, slow onset of about 5–8 minutes and duration of action ranging from 1.5 to 2 hours. During caesarian section, visceral pain can be experienced by patient, which is due to traction of peritoneum and intra-parietal organs; and to mask such effects larger doses of anesthetics is required. It has been observed that with higher doses of hyperbaric bupivacaine, incidence of intra-operative visceral pain associated with higher blocks is reduced.<sup>7,8</sup>

Opioids have always been a choice of drug in regional anesthesia as they improve the anti-nociceptive effect of local anesthetics. Intrathecal morphine added

to bupivacaine provides good postoperative analgesia for up to 24 hours.<sup>9,10</sup> Fentanyl, a lipophilic opioid agonist, produces rapid analgesia of shorter duration by blocking the central neuraxon.<sup>11</sup> Compared with intravenous fentanyl, intrathecal fentanyl decreases visceral pain and improves the quality of block.<sup>12</sup> The advantage of fentanyl is, as it does not tend to migrate to the fourth ventricle in sufficient concentration, that the respiratory depression is minimal, especially when administered intrathecally.<sup>13</sup>

The aim of present study was to observe the effect of intrathecal bupivacaine alone and in combination with fentanyl in two different doses of 12.5 & 25 µg with regards to onset of analgesia, intra-operative haemodynamics, quality of analgesia, degree of muscle relaxation (as evident by surgical ease & patient comfort during surgery) duration of analgesia and any adverse effects on maternal or neonatal systems.

### PATIENTS AND METHOD

This is a prospective randomized study, where all the selected consecutive patients undergoing caesarean section were included. The study cohort included 90 ASA I & II patients, divided into three equal groups, admitted from September 2010 to March 2011, who ranged in age from 20 to 35 years. This study was started only after obtaining approval from institutional ethical committee and written informed consent was taken from the patients after full explanations of the procedure. The inclusion criteria were patients of category ASA I & II in age from 20 to 35 years with normal coagulation profile. Patients with complicated pregnancy such as pregnancy induced hypertension, placenta previa, fetal distress and contraindication to central neuroaxial blocks were excluded from this study. None of the selected patients based on above mentioned criteria were excluded from the study. After necessary investigations were carried out, all 90 selected patients were randomly divided into three equal groups. The group I (n=30) received 2ml of 0.5% hyperbaric bupivacaine (B) alone, group II (n= 30) received 12.5 µg of fentanyl along with 2ml of 0.5% hyperbaric bupivacaine (BF<sub>L</sub>) and group III (n=30) received 25 µg of fentanyl along with 2ml of 0.5% hyperbaric bupivacaine (BF<sub>H</sub>).

An intravenous access was achieved in the pre operative room and all patients were pre loaded with 500 ml of Ringer's Lactate solution. Urinary bladder was catheterized in all patients before the start of surgery, and kept in situ until 24 hours postoperatively. In the operation theater, after establishing non invasive monitors, patients were positioned in the right decubitus, a 25 G pencil point spinal needle was introduced into the L<sub>2</sub>-L<sub>3</sub> inter-vertebral space the assigned drug was administered intrathecally, after

confirming free flow of CSF. Patients were turned into supine position and a wedge was placed under right side and 4 liters/ min O<sub>2</sub> was administered by face mask. The electrocardiogram, heart rate, oxygen saturation, non invasive blood pressure and respiratory rate were continuously monitored and recorded till the completion of surgery.

The surgical anesthesia was graded as excellent, good and poor depending on complain of patient and surgeon and requirement of analgesics. If there were no complaints from patient or surgeon without requirement of analgesics, it was categorized excellent. If complaint of pain which was relieved by analgesics, it was considered as good, whereas if more than one dose of analgesic or rescue GA was required, it was termed as poor.<sup>14</sup> The total duration of analgesia was considered from the time of injection of spinal anesthetic, until the first request for analgesic by the patient. The duration of effective analgesia, use of total I.V. fluids and Mephentermine, relaxation at the operative area, side effects, umbilical cord blood gases, Apgar and neurological and adaptive capacity scores of the newborn were compared among the groups. Maternal side effects such as hypotension, bradycardia, respiratory depression, nausea, vomiting, were noted and appropriately treated. Respiratory rate below 9 / minutes or SpO<sub>2</sub><90% on room air was regarded as respiratory depression. A fall in systolic BP by 25% of baseline value was considered as hypotension, and was treated with Inj. Mephentermine. The pulse rates less than 50bpm was treated as bradycardia and if necessary inj. Atropine was used. The neonate was observed for Apgar score at 1 and 5 minutes. The relevant clinical data were analyzed statistically.

### RESULTS

There was no significant statistically differences among all three groups with respect to age and weight, baseline heart rate, blood pressure, respiratory rate and oxygen saturation as shown in table1.

**Table-1: Comparison of Demographic profile (Mean ±S.D.)**

	GROUP B	GROUP BF <sub>L</sub>	GROUP BF <sub>H</sub>
NO. OF PATIENTS	30	30	30
AGE	26.03±4.99	25.1±3.7	25.33±4.53
WEIGHT	60.67±4.02	61.97±4.17	61.73±3.64
BASELINE H.R.	73.43±3.94	74.97±5.57	73.1±4.79
BASELINE SYSTOLIC B.P.	120.6±9.35	120.33±9.79	120.8±10.6
BASELINE DIASTOLIC B.P.	76.23±7.22	77.46±7.28	76.3±7.57
BASELINE R.R.	16.33±1.89	16.33±2.29	16.06±1.62
BASELINE SpO <sub>2</sub>	99.3±0.75	99.3±0.83	99.2±0.99

**Table-1A. Showing the prob. values of t (unpaired 't' test) b/w the different groups**

S.No.	Parameters	B & BF <sub>L</sub>		B & BF <sub>H</sub>		BF <sub>L</sub> & BF <sub>H</sub>	
		PROB. OF "t"	p-value	PROB. OF "t"	p-value	PROB. OF "t"	p-value
1	AGE	.1395	p>.001(N.S.)	.1401	p>.001(N.S.)	.1801	p>.001(N.S.)
2	WEIGHT	.2106	p>.001(N.S.)	.1907	p>.001(N.S.)	.1423	p>.001(N.S.)
3	BASE LINE HEART RATE	.1138	p>.001(N.S.)	.2210	p>.001(N.S.)	.2901	p>.001(N.S.)
4	BASE LINE SYSTOLIC B.P.	.2012	p>.001(N.S.)	.3015	p>.001(N.S.)	.1800	p>.001(N.S.)
5	BASE LINE DIASTOLIC B.P.	.3150	p>.001(N.S.)	.1922	p>.001(N.S.)	.3105	p>.001(N.S.)
6	RESPIRATORY RATE	.2217	p>.001(N.S.)	.3011	p>.001(N.S.)	.0905	p>.001(N.S.)
7	OXYGEN SATURATION	.3421	p>.001(N.S.)	.4215	p>.001(N.S.)	.1005	p>.001(N.S.)

\*P>.001 shows no significant difference b/w groups at  $\alpha$ =.001 level of significance.

The hypotension were observed in 10% in group B and BF<sub>L</sub> as compared to 16.67% in BF<sub>H</sub> group, and was treated with rapid infusion of fluids and vasoactive drugs, if required for maintaining blood pressure. Bradycardia was slightly less in group B and was treated with injection atropine; however respiratory

depression were seen in 6.67% in BF<sub>H</sub> and 3.33% in BF<sub>L</sub> group. None of patient in group B developed respiratory depression. 96.67% patients of BF<sub>H</sub> group had excellent comforts during surgery, as compared to 76.67% and 16.67% in BF<sub>L</sub> and B group.

**Table-2. Comparison of Intraoperative hemodynamic, status of comforts, duration of analgesia and analgesics requirement**

	GROUP B	GROUP BF <sub>L</sub>	GROUP BF <sub>H</sub>
Hypotension	3(10%)	3(10%)	5(16.67%)
Bradycardia	3(10%)	4(13.33%)	4(13.33%)
Respiratory depression	0	1(3.33%)	2(6.67%)
Comfort experienced during surgery (Excellent: Good: Poor)	5:13:12 (16.67%:43.33:40%)	23:5:2 (76.67%:16.67%:6.66%)	29:1:0 (96.67%:3.33%:0)
Duration of complete analgesia (min.)	126±2.39	164±3.22	206±5.18
No. of analgesics used during surgery	25 (83.33%)	7(23.33%)	1(3.33%)

**Table-2A. Showing statistical values in duration of complete analgesia**

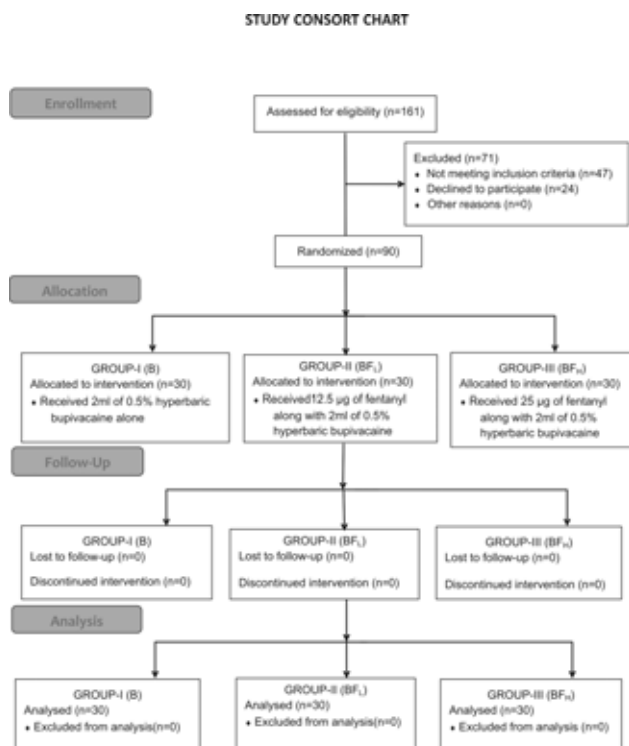
	B & BF <sub>L</sub>	BF <sub>L</sub> & BF <sub>H</sub>	B & BF <sub>H</sub>
Z calculated	2.89	3.11	4.12
P value	.000289	.000016	.0000

The requirements of analgesics during surgery were 83.33% in the drug group B. The duration of complete analgesia, which is the period between time of injection of spinal anesthetic to first request for analgesic by patient after surgery, was maximum (206 minutes) in BF<sub>H</sub>, followed by 164 minutes and 126 minutes in BF<sub>L</sub> and B alone group respectively. 'Z' test for double

sample mean was applied to test the significant difference between the groups. Significant difference was observed between all the groups. There was no difference in neonatal Apgar scores in all three groups in 1 and 5 minutes after birth. Apgar scores were in between 9-10 after 5 minutes (table-3).

**Table-3. Comparison of APGAR score**

Time of assessment	GROUP B	GROUP BF <sub>L</sub>	GROUP BF <sub>H</sub>
1 minute	8-9	7-9	7-9
5 minute	9-10	9-10	9-10



**DISCUSSION:** Recently, the choice of obstetric anesthesia has drastically changed. The trend has been shifted from general anesthesia to regional anesthesia, might be due to associated higher mortality rate in general anesthesia as compared to regional anesthesia. Heavy bupivacaine 0.5% is used commonly for spinal and isobaric bupivacaine (0.5%) for epidural anesthesia these days. Due to the synergistic effect of fentanyl and local anesthetics like bupivacaine, the administration of fentanyl intrathecally has become established method for intra-operative anesthesia and post-operative analgesia.<sup>15</sup> Previously morphine was used through subarachnoid route as routine management of post-operative analgesia, due to its side effects particularly late respiratory depression, drug addiction and pruritus, its use has been restricted. Fentanyl, which is more lipophilic than morphine has definitely some advantages over morphine like rapid onset of action, early elimination from the cerebrospinal fluid and lesser incidence of respiratory depression.<sup>16</sup>

Visceral pain is a common problem in cesarean section under spinal anesthesia. In our study we found no pain in BF<sub>L</sub> and BF<sub>H</sub> group however, visceral pain was not fully abolished in group B, which was corroborative with the study conducted by Choi *et al.*<sup>17</sup>. It is evident from the results that the depth of anesthesia in BF<sub>H</sub> group is equivalent to BF<sub>L</sub> group. This proves that by adding fentanyl, even in low dose, adequate depth of spinal anesthesia can be achieved. Incidence of hypotension was more significant in the BF<sub>H</sub> group as compared to the groups B and BF<sub>L</sub>. Bradycardia results from the blockade of sympathetic cardio

accelerator fibers and decreased venous return to the heart. In our study bradycardia occurrence was overall 7% with no significant intergroup variation. This is in accordance with Singh *et al.*<sup>18</sup>. About 75–90% of the patients become drowsy but arousable with the intrathecal fentanyl addition as compared to those without fentanyl addition. However, there is report where fentanyl addition do not cause any change in the sedation, similar to the findings of Randalls *et al.*<sup>19</sup>. Further, negligible incidences of pruritus, nausea and vomiting, shivering or respiratory depression were observed. Also, the Apgar score of the babies remained same in all the groups. There was longer duration of postoperative analgesia in BF<sub>L</sub> and BF<sub>H</sub> groups; this also increases with the increasing dose of bupivacaine. However, motor recovery was not affected by the addition of fentanyl.

## CONCLUSION

The result of our study indicated that 12.5 µg of fentanyl added to 0.5% bupivacaine for spinal anesthesia markedly improved intraoperative anesthesia and significantly reduced the demand for post operative analgesics with good maternal satisfaction and fetal outcome.

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# An Application of Linear Mixed effect Model to Compare the Drug Treatment effect in Patients with Type 2 Diabetes

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## ABSTRACT

In this article, different types of mixed effect models have been applied for drug effect comparison in type 2 diabetes patients. The mixed effect models have been applied through Bayesian approach and compared with frequency approach. The combination of metformin with pioglitazone is found to be effective compared to pioglitazone with gliclazide.

**Keywords:** MCMC, FBS, AR(1).

## INTRODUCTION

The number of patients with type 2 diabetes has increased dramatically over the last few decades. In spite of the best efforts of clinicians, the incidence of Type 2 Diabetes Mellitus (T2DM) and its complications are on the rise. A fixed dose combination tablets are a second-line drug treatment for T2DM when metformin monotherapy fails<sup>1</sup>. Gliclazide can be prescribed to those patients who are already stabilized on metformin standard tablets. Recently, different methods have been employed to analyze the diabetes data. The commonly used methods are t-test, analysis of variance and analysis of covariance<sup>2</sup>. Mixed effects model is widely applicable to analyze the discrete as well as continuous longitudinal data. It is useful for normally distributed random effects in accumulation of fixed effects<sup>3</sup>. The Bayesian approach gives consistent results compared to frequency approach<sup>4-5</sup>. Through in Bayesian approach, the inference of the random effects can be obtained through the markov chain monte carlo (MCMC), but it is not possible in frequency approach. In this work, different types of model have been applied through Bayesian approach focusing on the most commonly used procedure, compared with maximum likelihood estimator (MLE) and restricted estimation of maximum likelihood (REML) estimator through frequency approach. The primary objective of this work is to apply different models and approach on sample value in the parameter that have been obtained from several visits of type 2 diabetes patients for drug effect comparison.

### Linear mixed effect model

Mixed effect models are primarily useful to describe the relationship between the grouped response variable and covariates<sup>9</sup>.

The model can be expressed as

$$Y_{ij} = \mu + t_j + e_{ij} \quad \dots(1)$$

where, j= treatment 1 or treatment 2.

$Y_{ij}$ =observation for treatment j on the  $i^{\text{th}}$  patients,

$\mu$ =overall mean

$t_j$ =effect of treatment j,

$e_{ij}$ =error for treatment j on the  $i^{\text{th}}$  patients follows  $Normal(0, R_i)$ .

where  $R_i$  is the covariance matrix for  $i=1,2,\dots,n$ .

The constant  $\mu$  is the overall mean of the observation. The terms  $\mu+t_A$  and  $\mu+t_B$  are the mean of the treatment group A and group B respectively. The constants  $t_A$  and  $t_B$  are obtained from the data.

The classical approach of estimation and inference is based on the maximum likelihood (ML) and REML for  $\beta$  (regression coefficient)<sup>6</sup>. It is important to consider both the approach REML and MLE in mixed modeling<sup>7</sup>. The use of software R (2.10.1) has been made the estimates of the parameters by MLE and REML.

### Bayesian Model

The general linear mixed model for the response vector  $Y_i$  of  $i^{\text{th}}$  subject is,

$$Y_i / b_i \sim N(X_i\alpha + Z_i b_i, R_i) \quad \dots(2)$$

$$b_i \sim N(0, D) \quad \dots(3)$$

In the Bayesian approach, the inferences can be obtained from the marginal model of the longitudinal

response observation<sup>7</sup>. Let,  $f_i(y_i/b_i)$  and  $f(b_i)$  be the density function of the equation (2) and equation (3) respectively.

The marginal density of  $Y_i$  can be obtained by

$$f_i(y_i) = \int f_i(y_i / b_i) f_i(b_i) db_i \dots(4)$$

### IMPLEMENTATION

Brown and Prescott (2006)<sup>8</sup> have developed the method for longitudinal response  $Y_{it}$ . They have used likelihood for fixed effect model without random effect on patient's response. In that model, baseline and treatment effect were compared with the new treatment as the reference category :-

$$Y_i = \mu + \beta B_i + t_i + e_{ij} \dots(5)$$

where, all assumptions are same with equation (1) except baseline observation  $\beta$  of the  $i^{th}$  individuals. In model 1, the same likelihood has been used.

Horrace and Schmidt (2000)<sup>10</sup> have used the model for continuous data in the form of,

$$Y_{ij} = \alpha_i + \beta X_{it} + e_{ij} \dots(6)$$

where,  $a_i$  and  $e_{ij}$  are both taken as normal and  $a_i$  is the random effect independent to the outcome. The attachment of individual random intercept in equation (6) leads to the model 2. In model 2, the correlation ( $r$ ) for subject effect has been assumed to follow a uniform prior with  $U(0,1)$ .

Butler and Louis (1992)<sup>11</sup> have used the non-parametric mixture approach of sub-population on the effect  $b_i$ . They have assumed that the sub-populations have different means and variance. The sub-population means summing to zero has been taken in the model 3. Escobar and West (1998)<sup>12</sup> have used the Dirichlet prior in mixed effect model. In model 4, the Dirichlet process prior with the random effect model has been applied and compared with other models.

### APPLICATION

This secondary data set has been obtained from the clinical trial, conducted in 2008. The patients are taken from the randomized double blind and parallel group study conducted in Menakshi Mission Hospital, Tamil Nadu. The part of the data set has been considered with fasting blood sugar (FBS) sample of 100 patients: 50 of these are grouped as treatment 1 (metformin with pioglitazone) and rests of them are in treatment 2 (pioglitazone with gliclazide). Patients are followed up on three occasions during a 12-month period. The FBS is measured on each of these 3 visits.

For the Bayesian model, the normal distribution with a mean of 0 and variance of 0.001 as a prior

distribution has been assumed and applied. The starting point of the  $\beta$  coefficient is based on the result of the previous study. Here, the models have been compared through the generated Decision Information Criteria (DIC) value. The computed posterior means are the estimates of each parameter of interest. Result presented here is based on the combined 11000 draws from the posterior distribution.

Model 1 has been applied to assess the effect of treatment by,

FBS =  $\beta$ (Intercept) +  $\beta_1$ \* treatment effect + error term for the  $i^{th}$  patient.

In this trial 28 patients dropped out from the study before the final visit. To overcome the biased estimate of the treatment effect the 'last value carried forward' approach is considered to substitute the lost observation. In model 1, the treatment effect on FBS is considered. The patients with relatively high FBS before study are likely to be high at the end of the study. To deal with such problem in model 2 the baseline covariate effects in FBS is attached. In this model, the relationship between final FBS and baseline value is considered in linear form. It is found that, within each treatment group, an increase of 1 unit in the baseline FBS is associated with an average increase of  $b$  unit in the follow up FBS. *It is possible that some practitioner may observe higher FBS value than others. Model 3 allows for this possibility by adding practitioner effect in the model 2. The model 3 is like,*

$$FBS_i = \beta(\text{Intercept}) + \beta_1 * \text{treatment effect} + \beta_2 * \text{practitioners effect} + \text{practitioner} + \text{error term for } i^{th} \text{ patients}(t) \dots(7)$$

Where,  $c_j$  can be taken as a practitioner effect. The model 3 can be considered as more consistent compared to model 2.

The response of patients to treatment may vary between the practitioners. *It is true that effects of treatments on practitioners can not be added on. So, the interaction effect has been applied. The extension has been applied on model 4 by*

$$FBS_i = \text{Intercept} + \beta_1 * t_k + \beta_2 * c_j + \beta_3 * (ct)_{jk} + t_i \dots(8)$$

where,  $(ct)_{jk}$  = the  $k^{th}$  treatment effect of the  $j^{th}$  practitioner.

or it can be written as,

FBS<sub>i</sub> =  $\beta$ (Intercept) +  $\beta$  \* treatment effect +  $\beta_2$  \* practitioners effect +  $\beta_3$  \* practitioners effect \* treatment effect + error term for  $i^{th}$  patients(t).

This model allows for the treatment variation among the practitioners.

**Table 1: Demographic characteristics for safety population**

Parameters	Pioglitazone with Metfomin	Pioglitazone with Gliclazide
n	50	50
Sex	32(64%)	
Male(%)	18(36%)	36(72%)
Female(%)		14(28%)
AgeMean(SD)	52.06(10.62)	55.32(8.27)
BMIMean(SD)	22.18(2.34)	29.18(3.02)

**MODEL DIAGNOSTICS**

Table 2 reveals that in the linear mixed model the impact of including subject as random effects for MLE is similar to including the subject as random effects in REML. These two estimates for both the procedures are essentially identical.

**Table 2: Linear mixed-effects model fit by MLE and REML in type 2 diabetes patients data**

Mo Model	AIC AIC	BIC BIC	$\beta_0$ (se)	$\beta_1$ (se)
MLE	146 1.46	147 1473.45	15.07(3.24)	-35.06(2.46)
RR REML	146 9.86	148 1481.9	18.42(2.03)	-35.06(2.46)
			L-ratio	p-value
R REML	155 5.5	157 1573.48		
MLE	159 0.14	160 1602.13	38.64	<0.0001

Table 3 reveals output from the different model in mean (sd) of the posterior distribution. In the bivariate normal subject model, the parameter estimates and standard errors consistently do not exceed the corresponding of the MLE and REML procedure in the linear mixed model.

**Table 3: Estimated Parameter of model in type 2 diabetes patients**

Parameter	Model1	Model2	Model3	Model4
$\beta$ (Intercept)	3.26(0.20)	3.12(0.12)	4.26(1.03)	3.94(0.07)
$\beta_1$ (treatment effect)	0.01(0.60)	NA	0.76(1.07)	0.03(0.03)
$\beta_2$ (practioners effect)	0.08(.71)	NA	0.72(1.30)	0.05(0.84)
$\tau$ (error term)	NA	0.98(0.05)	1.11(1.07)	NA
$\rho$ (correlation coefficient)	NA	0.98(0.005)	NA	NA

Among the four models, the minimum DIC value is in model 1 followed by model 4. It can be concluded that Model 1 and Model 4 are appropriate compared to the other models. The standard deviations of  $b_2$  values confirm that model 1 is suitable as compared to other models. In model 4, there is no provision to present result for r. Model 2 provides a minimum standard deviation for r compared to model 1 and model 3. It is very difficult to make out which model is the best, but keeping in view the problems, model 1 can be considered the best and appropriate.

**RESULTS**

The base-line characteristics are similar in the two groups (Table 1). More patients discontinued the study treatment in the (pioglitazone with gliclazide) group (20 percent) than in the (metformin with pioglitazone) group (16 percent).

At base line, mean BMI of the patients (22.18 ±3.02) in the (metformin with pioglitazone) group and (29.18±3.02) in the pioglitazone with gliclazide group) has been observed. The blood sugar declined progressively during the course of the study. At baseline, the averaged values of FBS is 173.26 mg/dl in the (metformin with pioglitazone)group and 190.84 mg/dl in the (pioglitazone with gliclazide) group ,respectively (P<.005); at three month, the values are 137.82 mg/dl and 152.32 mg/dl, respectively (P<.005); and at the end of the study they are 103.14 mg/dl and 133.10 mg/dl of FBS in the both drug set up [P<.005] are given in Table 4. *The fitted line of regression for FBS under four different Bayesian models specified by,*

**Table 4: Description of Diabetes Data Set Drug Combication pioglitazone with metfomin pioglitazone with gliclazide**

Parameter	Mean (SD)	Mean (SD)	P-value
FBS in Obs=1	173.26(48.31)	190.84(56.83)	<.001*
FBS in Obs=2	137.82(36.1)	152.32(38.83)	<.001*
FBS in Obs=3	103.14(74.34)	133.10(24.46)	<.001*
PPBS in Obs=1	267.3(52.88)	285.94(74.46)	<.001*
PPBS in Obs=2	200.55(26.75)	238.88(55.98)	<.001*
PPBS in Obs=3	151.91(0.15)	202.56 (48.08)	<.001*
HBA1C in Obs=1	9.62(1.09)	9.61(1.66)	<.001*
HBA1C in Obs=2	8.41(0.8941)	8.72(1.49)	<.001*
HBA1C in Obs=3	7.62(32.43)	8.13(1.34)	<.001*

\* p-value <0.001

Model 1:- FBS=3.26+0.01\*treatment effect+817.5

Model 2:- FBS=3.12+0.98(correlation of subject effect)

Model 3:- FBS=4.26+0.76\*treatment effect+0.72\*practitioner effect +1.11

Model 4:-FBS=3.94+0.03\*treatment effect+0.05\*practitioner effect+0.72\* practitioner effect\* treatment effect.

Comparing the first point estimate, it appears that the estimated value of the MLE and REML are same. However, MLE has produced less Akakie Information Criteria (AIC) and Bayesian information Criteria (BIC) as compared to REML. The average  $b_1$  is -35.06(2.46) for the MLE and -35.06(2.46) for the REML, indicated a



strong agreement between the two sets of procedures. Incorporating prior evidences through Model 1 to Model 4, the estimates of the  $\beta_1$  are 0.01(0.06) in Model 1, 0.76(1.07) in Model 3 and 0.03(0.03) in Model 4. Model 2 has failed to generate  $b_1$  estimate. The DIC value in model 1 is 886.28 as compared to the 930.21 in Model 2, 923.13 in Model 3 and 886.28 in Model 4. The DIC can be obtained at the time of the model in Win BUGS software<sup>13</sup>, which is establishing itself more attractive to practitioners. However, it is difficult to compute the DIC average value from Win BUGS<sup>14</sup>.

### CONCLUSION

This study of secondary data has established that (pioglitazone), along with conventional metformin, confers better blood sugar control in type 2 diabetes patients. This study extends our knowledge of the efficacy of treatment in patients with type 2 diabetes. There is no significant difference between the (metformin with pioglitazone) group and the (pioglitazone with gliclazide) group in the composite secondary end point of morbidity. The statistical models with prior information need to be considered regarding information about the level of complication. We hope that the findings will go a long way towards achieving the goal and may also have an important model fitting with Bayesian approach.

This clinical trial could be completed with the conventional statistical approach and p-value. The Bayesian analysis attaches the efforts of how the trial could change our opinion about the treatment effect. It is useful to account more variation in the model. The results of prediction are much wider in interval compared to the MLE and REML and they reflect more consistent by the model. The features of the model are important to consider before applying the small data set in the clinical trial.

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# Death due to Tuberculosis in Homeless Unclaimed Population in Central Delhi - A Retrospective Study

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## ABSTRACT

Homeless and marginally housed people in developing countries have specific problems predisposing them to infectious diseases; have much greater risk of developing the active form of tuberculosis and much higher mortality and shorter life expectancy. India has the largest number (14 million) of TB sufferers in the world. We need to do a much better job in preventing tuberculosis from spreading in this homeless vulnerable population, and in providing timely, effective clinical care for those who are affected by this disease.

We carried out a 5 years retrospective study period between year 2006 and 2010, based on autopsy findings, in the department of forensic medicine at Lady Hardinge Medical College, New Delhi. During this study we tried to find out the load of mortality due to tuberculosis in homeless population of central district of New Delhi (capital of India), where those unclaimed dead bodies were brought for postmortem examination, all unknown and unclaimed deaths were considered suspicion. During this 5 year period total 2773 autopsies were conducted in the morgue of LHMC, New Delhi, out of that, 749 cases (27.01%) were homeless unclaimed people. 122 deaths (16.28%) were due to pulmonary tuberculosis in homeless. The maximum 40 cases (32.78%) were in age group of more than 50 years individuals, and minimum in age group of 11 - 20 years; 3 cases (2.45%). Further, males were predominantly contributed with 116 cases (95.08%) and remaining 6 cases (4.91%) were females. Maximum deaths were occurred during rainy season (July - September); 56 deaths (45.90%).

**Keywords:** Tuberculosis, Death, Homeless, Postmortem, Natural Disease.

## INTRODUCTION

According to a report in 2011, there were over 67,000 homeless in Delhi, of whom 15% are women and 10% children<sup>24</sup> Delhi's total population is 16753235 according to 2011 census<sup>10</sup> and Central Delhi is having 578,671 populations. India is one of the fastest growing economies in the world but number of people being left behind homeless.

Tuberculosis is a serious, contagious disease of poverty. Tuberculosis infection can remain dormant for years before becoming active. However, persons with weakened immunity, especially homeless and

marginally housed people have much greater risk of developing the active form of tuberculosis and much higher mortality and shorter life expectancy. According to the W.H.O., TB killed 1.75 million people in 2003 worldwide. TB is one of the three top causes of avoidable death in poor countries. Overall, one-third of the world's population is currently infected with TB with the highest incidence and mortality occurring in the South-East Asia Region (33%). India has the largest number of TB sufferers in the world. WHO figures for India are revealing:

- There are an estimated 14 million people with active TB
- Each day more than 20,000 people get infected with the tuberculosis bacillus, 5000 people develop TB, and more than a 1000 die.
- The annual death toll is 421,000.
- TB kills more people in India than HIV/AIDS, STDs, malaria and other communicable diseases combined.

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**MATERIAL AND METHOD**

This is a retrospective study based on the autopsy records of Department of Forensic Medicine, Lady Hardinge Medical College, New Delhi, which is responsible for of all medico-legal deaths post-mortem examination in Central district of New Delhi. Almost all deaths among homeless people are regarded as suspicious and they were registered as medico-legal case and brought by police for autopsy.

We retrospectively analyzed the autopsy records of the 5-year period between the years 2006 and 2010. The population that was selected for the study comprised was homeless and died in Central district of New Delhi. The status of homelessness of the cases was determined and reported to us by the police. Further, the cases were studied in detail as age, sex, day and time of deaths and then described in tabular form for better understanding.

**RESULTS**

We carried out a 5 years retrospective study from 1<sup>st</sup> Jan. 2006 to 31<sup>st</sup> Dec. 2010, based on autopsy findings,

in the Department of Forensic Medicine at Lady Hardinge Medical College, New Delhi. During this study we tried to find out the load of mortality due to tuberculosis in homeless population of central district of New Delhi, where those unclaimed dead bodies were brought for postmortem examination, all unknown and unclaimed deaths were considered suspicion. During this 5 year period, total 2773 autopsies were conducted in the morgue of LHMC, New Delhi, out of that, 749 cases (27.01%) were homeless unclaimed people. 122 deaths (16.28%) were due to pulmonary tuberculosis in homeless.

Table number 1 shows that in our study, we found the maximum number of deaths in homeless people due to tuberculosis in age group of more than 50 years individuals, which constitutes 40 cases (32.78%) and minimum number in age group of 11 – 20 years; 3 cases (2.45%). Further, it shows distribution of homeless death due to tuberculosis, the maximum 57 cases (46.72%) were in the year 2010 and minimum 4 cases (3.27%) in the year 2007. This might have been due to before year 2010 there was practice to do waive off unclaimed homeless dead bodies from postmortem examination by competent authority i.e. police.

**Table No.1: Year wise distribution of tuberculosis death in homeless according to age and gender**

Year	Male						Female Total						Grand	Percentage
	11-20 yr	21-30 yrs	31-40 yrs	41-50 yrs	>51 yrs	Total	11-20 yrs	21-30 yrs	31-40 yrs	41-50 yrs	>51 yrs	Total		
2006	1	3	2	3	5	14	0	0	0	0	0	0	14	11.75
2007	1		2	1		4							4	3.27
2008	0	2	2		10	14	0	0	0	0	1	1	15	12.29
2009	1	3	8	11	5	28	0	3	0	0	1	4	32	26.22
2010	0	13	13	13	17	56	0	0	0	0	1	1	57	46.72
Total	3 (2.45%)	21(17.21%)	27 (22.13%)	28 (22.95%)	37 (30.32%)	116 (95.08%)	0	3 (2.45%)	0	0	3 (2.45%)	6 (4.91%)	122 (100%)	100

Table number 2 shows the age and gender wise distribution of tubercular deaths in homeless, where

males are predominantly contributed with 116 cases (95.08%) and remaining 6 cases (4.91%) were females.

**Table No.2: Distribution of tuberculosis deaths according to age and gender**

Cause of death	11- 20 yrs	21-30 yrs	31-40 yrs	41-50 yrs	>51 yrs	Total	Percentage
Male	3	19	27	30	37	116	95.08
female	0	3	0	0	3	6	4.91
Total	3 (2.45%)	21 (17.21%)	27 (22.13%)	30 (24.59%)	40 (32.78%)	122(100)	100

Table No.3 shows that maximum deaths were occurred in month of July to September (n=56, 45.90%) with highest number 21 cases (17.21%) in month of July.

**Table No.3: Distribution of cases according to months**

Month	Total no. of deaths	Percentage
January	4	3.27
February	2	1.63
March	2	1.63
April	3	2.45
May	5	4.09
June	12	9.83
July	21	17.21
August	17	13.93
September	18	14.75
October	14	11.47
November	15	12.29
December	9	7.37
Total	122	100

Table No. 4, shows that almost all dead bodies 118 cases (96.72%) were registered as brought dead and only 4 cases (3.27%) were died in hospital during the course of treatment.

**Table No. 4: Distribution of cases according brought dead and hospital death**

Year	Brought dead	Hospital death	Total
2006	14	0	14
2007	4	0	4
2008	14	1	15
2009	31	1	32
2010	55	2	57
total	118 (96.72%)	4 (3.27%)	122 (100%)

## DISCUSSION

The rising homelessness is a challenge for both developing and developed nations where is fast economic growth but creating a number of homeless people. Today at least half a million Americans are homeless<sup>6,14</sup>. Comparable numbers of people were estimated to be homeless in England in 1983 and in France in 1996<sup>6,25</sup>. Homeless population is predisposed to infections because of their poor physical state, low immunity and lack of hygiene, hence outbreaks of contagious diseases are more ubiquitous in the homeless. Furthermore, homelessness not only damages the health of the affected individuals but also promotes the spread of diseases like tuberculosis into the general population<sup>12</sup>.

Death from respiratory diseases is reported to be seven times higher in the homeless<sup>1</sup>. In Boston, between

1986 and 1988, respiratory diseases caused 20% of the total deaths in the homeless population concurrent to our findings. Tuberculosis was responsible for 16% deaths while 44% were caused by non-tuberculosis pneumonia<sup>21</sup> whereas 16.28% deaths in our study due to tuberculosis. Tuberculosis is an important health problem among the homeless and residents night shelters and hostels<sup>28</sup>. The prevalence of latent tuberculosis infections among homeless people is reported to be as high as 9–79%, while the prevalence of active disease has been reported to be 1.6–6.8%<sup>5,6,27</sup>. The incidence of tuberculosis has recently been estimated to be 270 cases/100 000 per year in the homeless population of San Francisco.<sup>20</sup> The risk of acquiring tuberculosis was associated with HIV infection, substance abuse, and stay in shelters, where overcrowding is a problem.<sup>23</sup> Homeless people may have been infected with the tubercle bacillus as children and active tuberculosis might result from reactivation of infections from alcoholism, drug addiction, HIV infection, or poor nutrition<sup>28</sup>. In Melbourne, molecular analyses of 19 isolates of *Mycobacterium tuberculosis* from homeless patients showed that 18 had the same profile, suggesting people-to-people transmission of tuberculosis within a shelter<sup>9</sup>. In Paris tuberculosis infection was significantly associated with homelessness<sup>12</sup>. Homelessness is likely to have a key role in the spread of tuberculosis in the community and poor socio-economic conditions are still the main risk factors associated with active transmission of the pathogen<sup>5,22,27</sup>. The contact tracing is best done in homeless shelters rather than using named personal contacts and treatment carefully monitored<sup>28</sup>. It has been suggested that homeless patients with tuberculosis should be routinely institutionalised throughout the course of therapy to ensure compliance<sup>28</sup>. Housing programmes are more appropriate than acute care hospitals since they significantly reduce costs and successful treatment completion rates of up to 100%. This situation contrasts with acute care hospitals where treatment completion rates are up to 85%.<sup>19</sup> About 56 per cent of all infections in immigrants involved strains that were not known to be circulating in the city, and were likely acquired in other parts of the world where drug resistance is common.<sup>29</sup>

Ishorst et al<sup>15</sup> analyzed 388 deaths of homeless people between 1990 and 1998 post-mortem results showed that homeless people are usually in a poor state of health, the most frequent natural cause of death was infection (16.8%). Brickner P.W, et al<sup>6</sup> analyzed that trauma, pulmonary tuberculosis, infestations, and peripheral vascular disease are common problems among the homeless. Gaur SN et al<sup>11</sup> reported poverty and poor nutritional status for the high rates of tuberculosis in elderly; the case fatality was significantly higher (15.6%) in the age group > 65 years, in

concurrency of our study. Arvind Kr et al<sup>3</sup> reviewed 735 autopsy cases of homeless, most victims (61.36%) died from natural causes and the majority of deaths were reported in the rainy season (38.64%) in concurrence of our findings that 45.90% cases between July to September. The majority of TB cases in urban homeless populations are attributable to ongoing transmission in shelters<sup>17,27</sup>.

If a drug resistant strain of tuberculosis were introduced into the shelter system, it could set off an outbreak that would have serious public health implications and be very difficult to control<sup>8</sup>. Human immunodeficiency virus seroprevalence was 8.5% (95% confidence interval (CI), 7.0% to 10.1%) and the prevalence of TB infection was 32% (95% CI, 30% to 37%)<sup>31</sup>. Nineteen percent of the HIV-seropositive subjects had positive tuberculin skin tests. Tuberculosis infection was associated with the duration of homelessness and living in crowded shelters or single-room-occupancy hotels.<sup>31</sup> Our study showed tuberculosis in 122 cases (16.28%) in concurrence to study of Yalcin et al<sup>30</sup> where natural events were the main cause of death with 138 cases (60.26%). Randy Hanzlick et al<sup>13</sup>, carried out a study of 128 homeless deaths during the period 1988-90, 98% of those who died were man, 55% occurred outdoors, 55% were due to natural. Oshaka T et al<sup>22</sup> reported in their study that approximately 59% homeless died due to natural diseases where tuberculosis contributed in about 44.8% cases, in comparison to our study found 14.95% cases of tuberculosis. In contrast to our study, maximum deaths in homeless during winter season especially in February<sup>22</sup>. Jonathan R et al<sup>16</sup> found in their study approximately 53% of deaths were occurring during June, August and September whereas in our study it was 45.90% between July to September.

### CONCLUSION

Homeless people have specific problems that increase their risk of disease, and which should be managed to avoid serious and preventable infections. There should be a high index of suspicion of tuberculosis in the homeless. We believe that first aid centres should be developed in shelters/clusters in large cities. Health workers, who specialise in improving the conditions of the homeless, should be available at these centres, and this may increase the health status of the homeless. We also need more affordable housing and we need better access to primary and specialized care for vulnerable homeless individuals.

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# A Comparative Study to Assess the Usage of Self Medication among Selected Urban and Rural Community of Pudhucherry

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## ABSTRACT

Self medication is proportionately increasing in both urban and rural community. The pattern of self medication use is not well established, hence, a cross sectional survey was undertaken which recruited 100 patients 50 from urban and 50 from rural in the state of Pudhucherry by convenience sampling method. Results revealed Overall 71 % of the subjects reported that they have used self medication at least once during their illness. On comparing the self medication practice among urban and rural community no statistical difference was found (P value = 0.825). There is need for authorities to make the existing laws regarding OTC drugs strong to ensure their rational sale and use. Moreover, specific pharmacovigilance is needed and the patient, pharmacist and physician must be encouraged to report any adverse events.

**Keywords:** *Self-medication, Rural, Urban, Over the counter drug, Medicines.*

## INTRODUCTION

Self-medication is an age old practice. Urge of self care, feeling of sympathy towards family members in sickness, lack of health services, poverty, ignorance, misbeliefs, extensive advertisement and availability of drugs in other than drug shops are responsible for growing trend of self-medication. WHO is promoting practice of self-medication for effective and quick relief of symptoms without medical consultations and reduce burden on health care services, which are often understaffed and inaccessible in rural and remote areas

**William Osler** has said that "A desire to take medicine is perhaps the great feature which distinguishes man from animals" This desire, however may play havoc when a person starts taking medicines on his own, forgetting that all drugs are toxic and their justifiable use in therapy is based on a calculable risk.

Self-medication can be defined as obtaining and consuming drugs without the advice of a physician either for diagnosis, prescription or surveillance of treatment. <sup>2</sup> There is a lot of public and professional concern about the irrational use of drugs. In developing countries like India, easy availability of a wide range of drugs coupled with inadequate health services result in increased proportions of drugs used as self medication compared to prescribed drugs.<sup>3</sup> Although, OTC (over the counter) drugs are meant for self

medication and are of proved efficacy and safety, their improper use due to lack of knowledge of their side effects and interactions could have serious implications, especially in extremes of ages (children and old age) and special physiological conditions like pregnancy and lactation.<sup>4</sup> As very few studies have been published regarding usage of self medication pattern in our community, we conducted this cross-sectional study in Pudhucherry to assess the usage of self medication in selected rural and urban community.

## MATERIALS AND METHOD

The study was a cross-sectional survey conducted in the year 2008 with a sample of 100 subjects conveniently selected from rural and urban regions (50 each) of Pudhucherry.

The study included patients above age group of 18 who can able to read and write and excluded the patients who are mentally unsound and who are not willing to participate in the study. To collect data regarding self medication usage a structured questionnaire was prepared, which was adopted from tool developed by Sharma et al (2005) <sup>5</sup> with the reliability coefficient of 0.89 (Test- Retest reliability) and with a content validity index of 0.91 between the experts. Prior to actual data collection approval to conduct the study was obtained from the Institute Head and from the

Medical in-charges of the concerned rural and urban community. Subjects were approached after giving explanation and with informed consent for the study. Every subject underwent a face to face interview to collect data followed by an educational counseling informally about potential adverse effect of consuming common self medication. Data collected were analyzed using appropriate descriptive (percentage, frequencies) and inferential statistics (chi square) using SPSS for windows statistical software version 14.

## RESULTS

### Basic demographic details

Majority of the subjects were in the age group of between 26-45 years in both rural and urban i.e. 62% and 58% respectively. More than half of the subjects were female i.e. 56% in rural community whereas in urban community male and female formed equal proportion of the total sample size. Detailed demographic characteristics of the subjects were given Table 1

**Table 1: Demographic characteristics of the subjects**

Sample characteristics	Rural (%)	Urban (%) n=100
<b>Age group</b>		
18-15 years	6(12)	5(10)
26-45 years	31(62)	29(58)
Above 46 years	13(26)	16(32)
<b>Sex</b>		
Male	22(44)	25(50)
Female	28(56)	25(50)
<b>Religion</b>		
Hindu	50(100)	43(86)
Muslim	0	3(6)
Christian	0	4(8)
<b>Income</b>		
Up to 5000	19(38)	1(2)
5001-10000	21(42)	11(22)
10000- 15000	7(14)	17(34)
Above 15000	3(6)	21(42)
<b>Occupation</b>		
Professional	1(2)	5(10)
Technical workers	16(30)	30(60)
Coolie	33(66)	15(30)
<b>Education</b>		
Illiterate	15(30)	8(16)
Literate	35(70)	42(84)
<b>Family type</b>		
Nuclear	37(74)	44(88)
Joint	13(26)	6(12)

### Findings related to usage of self medication.

Overall 71 % of the subjects reported that they have used self medication at least for one time during their ailments. On comparing the self medication practice among urban and rural community no statistical

difference was found (Table 2), indicating the practice of self medication is equally prevalent in both urban and rural areas. On associating the selected variables like age, sex, educational status, religion, income status, and occupation no statistical association was found. The most common reasons specified by the subjects both in urban and rural community for usage of self medication were as follows poor knowledge about adverse effects of self medication (59.2%), strong belief on efficacy of self medication (60.5%), lack of money for consultation and purchasing medicine (54.9%), and lack of time for consultation (52.1%).

**Table 2: Comparison of self medication use between Urban and rural community n=100**

Usage of self medication	Rural	Urban	P valu
Yes	35	36	0.825
No	14	15	

## DISCUSSION

The present study findings revealed 71% of the people had used self medication at least one time during their illness, the prevalence is comparatively similar to the findings of Phalke et al (2006)<sup>10</sup> but in contatry it is higher to previous published studies<sup>6</sup> which requires immediate attention but somewhat. In the present study no statistical difference were found between rural and urban subjects and even no statistical association was found between the selected variables, indicating an urgent need of educational intervention focusing on all sectors of community irrespective of place of stay, literacy level, occupational status, age, sex and religion etc.<sup>7</sup>

### Limitations of the study

Convenience sampling technique used in the study limits our finding for generalizabilty. Potential data related to group of drugs used by the patients could not be collected in cross-sectional survey designs due to lack of knowledge of subjects on generic names of drugs.

## CONCLUSION

Factors influencing self-treatment include patient satisfaction with the healthcare provider, cost of the drugs, educational level, socioeconomic factors, age and gender<sup>8</sup>. Interactions between prescribed drugs and the drugs taken for self-medication is an important risk factor of which healthcare providers must be aware of<sup>9,8</sup>.

Easy availability of wide range of drugs without prescription of registered practitioner in our country is the major factor responsible for irrational use of drugs as self medication, thus resulting into impending health problems (antimicrobial resistance, increased load of



mortality and morbidity) and economic loss. The need for promoting appropriate use of drugs in health care system is not only because of the financial reasons with which policy makers and manager are usually most concerned, but also for health and medical care of patients and the community. There is need for authorities to make the existing laws regarding OTC drugs strong to ensure their rational sale and use. Moreover, specific pharmacovigilance is needed and the patient, pharmacist and physician must be encouraged to report any adverse events. Periodic studies on the knowledge, attitude and practice of self medication may give insight into the changing pattern of drug use in societies.

#### ACKNOWLEDGEMENT

None

#### Conflict of interest

None

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# Central Adiposity and General Adiposity as Major Risk Predictors of Various Life Styles Related Diseases Especially Hypertension and Type 2 DM

Bandana Sachdev

*BMI, WC and W/H Ratio as Key Predictors for Type2 DM and Hypertension*

## ABSTRACT

The functional roles of Waist circumference (WC), Waist and hip ratio (W/H ratio) and Body mass index (BMI) as risk factors for hypertension and type 2 diabetes mellitus (DM) in the Nomads Tribal population of Rajasthan State are evaluated in the paper. Four hundred and forty-five participants, aged between 18 to 100 years old are taken as subjects for scientific study. The prevalence of pre-hypertension (34.4%), hypertension (22.5%), prediabetes 5.2 % (n= 23) and diabetes (approximately 3.4 %) (n=15) is noted in the select population. Body mass index, waist circumference, and waist/hip ratio in the study are shown to be associated with type 2 DM and hypertension. Women with W/H ratio > 85+ and men with W/H ratio > 1.0+ are shown to be prone to increased risk of diabetes. And subjects having body mass index (BMI) particularly in the range of (obese) >25 appear to be vulnerable to hypertension. Similarly subjects with greater waist circumferences look to be exposed to hypertension. The study in the paper also supports the observation that both BMI and WC yield almost the same results. The findings suggests that by keeping a check on modifying risk factors like BMI, WC and W/H ratio we can control the prevalence of life styles associated diseases like hypertension and type 2 DM.

**Keywords:** *Nomads, Adiposities, Incidence, SBP, DBP and FBG levels.*

## INTRODUCTION

The prevalence of type 2 DM is rising throughout the world, most rapidly in populations like India which are undergoing the epidemiologic transition from a mainly rural subsistence economy to an increasingly urban industrial economy. <sup>(1, 2)</sup> The associations of increased weight and body fat composition with non-communicable diseases, particularly cardiovascular diseases and diabetes, are well established. <sup>(3)</sup> Obesity has become a major worldwide epidemic affecting more than 300 million people. It is an important risk factor for type 2 DM, a chronic disorder of carbohydrate, fat, and protein metabolism. From the clinical perspective, visceral adipose tissue is known to generate diabetogenic substance <sup>(4)</sup> and, as such, may be more informative than total fat for diagnostic evaluation

Body mass index, waist circumference, and waist/hip ratio have been shown to be associated with type 2 DM and hypertension. As expected, epidemiologic studies have demonstrated that these three obesity indicators are strong and consistent predictors of lifestyles related diseases like type 2 DM and hypertension. However, despite the clear, clinical difference between visceral and other forms of fat, little epidemiologic difference would be expected in the relation of diabetes with body mass index versus waist hip ratio. From a statistical perspective, the two measures yield similar information, with the correlation coefficient typically about 0.8. <sup>(5)</sup> Several studies have shown that WC is a better predictor of type 2 DM, than is BMI, but these findings are inconclusive, <sup>(6-8)</sup> while other studies provide evidence that W/H ratio has a positive effect independent of BMI <sup>(9-11)</sup>

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In addition, the ability of these obesity indicators to predict diabetes may differ by ethnicity, age, and sex. <sup>(12-14)</sup> For example, among Asian populations, central obesity has been shown to be a more consistent predictor of diabetes than is total obesity, <sup>(11, 15)</sup> while general obesity has been shown to be a better predictor among white US populations and Europeans. <sup>(16, 17)</sup> To compare associations of hypertension and type 2 DM incidence with general and central obesity indicators, we

conducted a pilot study based on Tribal population of Rajasthan in India. Not a single study has been done so far on the population chosen so ours is the first attempt to study the role of central adiposity and general adiposity as indicators for the lifestyle related diseases especially diabetes and hypertension.

### Study design and Data collection

Present search was limited to tribal population of Jhunjhunu district of Rajasthan state in India. Data was collected through snow and ball method of sampling. We had gone to twelve to sixteen camps and collected data of nearly four hundred and forty-five participants. The study was approved by the institutional human ethics committee at BITS, Pilani and performed according to the Declaration of Helsinki. All study members received detailed explanation of the study in their regional language before giving consent. A survey questionnaire was designed and finalized after a field trial. Men and women  $\geq 18$  years of age were considered eligible except pregnant women, seriously ill subjects, and those who were on herbal medication or on drugs such as corticosteroids and oral contraceptive pills. Each subject was asked to report at a selected investigation site after an overnight fast.

Each participant was interviewed to know about occupation, education, housing, sanitation, family income and number of members in the family. Their status of physical activities, family history of diabetes, hypertension, and other kinds of diseases was also taken into account for this study. Other investigations included anthropometry, systolic and diastolic blood pressure, fasting plasma glucose and random plasma glucose test. Measurements of height, weight, and waist and hip circumference were taken with light clothes and without shoes. The weighing tools were calibrated daily by known standard weights. For taking standing height, the measurement has been taken with the help of stadiometer. Waist circumference was measured at the belly button or just above it. Similarly, the hip circumference was measured at its widest part. Blood pressure was taken after a 10-min rest with digital blood pressure machine. Classification of hypertension was based on ADA guidelines (a) Healthy blood pressure:  $< 120/80$  (b) Pre-hypertension: between  $120/80$  and  $140/90$  (c) Hypertension:  $140/90$  or higher. For diabetes the diagnostic criteria of the American Diabetes Association were used. (18) Statistical analysis: Linear regression analysis and scatter plots was drawn to find out the correlation between associated risk factors and the prevalence of type 2 DM and hypertension.

## RESULTS

Overall, mean and standard deviation values for each variables i.e. FBG levels, systolic blood pressure (SBP), diastolic blood pressure (DBP), and general, central adiposity and dietetic pattern were available for all 445 participants given in Table 1.

**Table: 1 Descriptive Statistics of study participants**

Parameters (n=445)	Data
Age (yrs) - Mean $\pm$ SD	45.39 $\pm$ 18.39
Sex- n (%)	
Male	195 (43.8)
Female	250 (50.2)
Height (cm) - Mean $\pm$ SD	160.21 $\pm$ 9.36
Weight (cm) - Mean $\pm$ SD	53.73 $\pm$ 11.18
BMI(kg/m <sup>2</sup> ) - Mean $\pm$ SD	20.94 $\pm$ 3.96
Waist circumference(cm) - Mean $\pm$ SD	74.74 $\pm$ 12.35
Hip circumference (cm) - Mean $\pm$ SD	84.19 $\pm$ 11.88
Waist to hip ratio(cm) - Mean $\pm$ SD	.8898 $\pm$ .08335
Blood Pressure	
Systolic(mm/Hg) - Mean $\pm$ SD	125.44 $\pm$ 18.89
Diastolic(mm/Hg) - Mean $\pm$ SD	80.36 $\pm$ 13.12
FBG levels (mg/dl) - Mean $\pm$ SD	108.32 $\pm$ 27.64

As can be seen from Table 2 a higher number of females were overweight (12.4%) and obese (17.6%) as compared to males. It was observed that there was (11.3%) obese male among the participants. In overweight category 13.1% of participants were having early high blood pressure and 17% obese subjects were having early high blood pressure (pre-hypertension). Similarly in overweight category 11% of participants were having high blood pressure and 23% obese respondents were having high blood pressure (hypertension). The subjects found positive for diabetes had BMI in the range of 23-25 (33.3%) and obese persons had BMI more than 25 or greater (20%). Those subjects that found at risk zone had BMI in the range of 23-25 (13.3%) and obese persons had BMI more than 25 or greater (17.4%). Females were more prone to increased Body mass index (BMI) related diseases as compared to males. Similarly it was noticed that females had more W/H ratio i.e. 67.6% as compared to males (10.3%). Waist to hip ratio has been divided into three categories i.e. low risk, moderate risk and high risk. The participants come under high risk category having cut off w/h ratio (85+) cm for females and (1.0+) for males. In high risk group, 31.7% of subjects had early high blood pressure and 28.6% had high blood pressure, 33.3% of them had positive blood glucose test and 56.5%

were at risk zone of pre-diabetes. The waist circumference was also found to be high in case of females (30%) as compared to males i.e. (12.8%). Thirty three (32%) subjects having circumferences higher than 80 cm for females and 90 cm for men had early high

blood pressure and 33% of participants had high blood pressure whereas 26.1% of them were at risk zone for prediabetes and 40.0% of them had positive blood glucose test

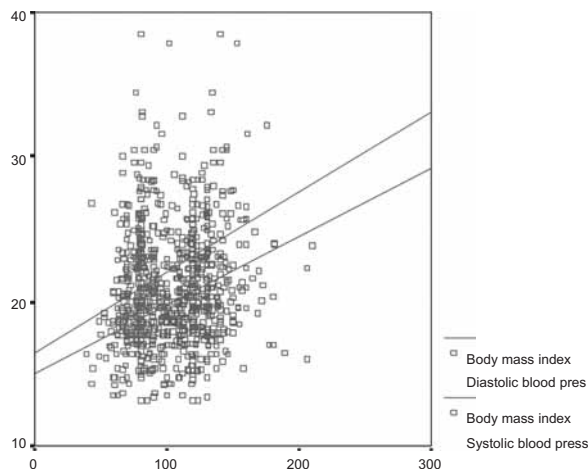
**Table 2. Prevalence of associated risk factors by gender, prehypertension hypertension, diabetes and prediabetes**

Variables	Male N (%)	Female N (%)	Pre-hypertension N (%)	Hypertension N (%)	Diabetes N (%)	Prediabetes N (%)
Body mass index:Kg/m <sup>2</sup>						
Normal(18-22.9)	97 (49.7%)	109 (43.6%)	64 (41.8%)	49 (49.0%)	5 (33.3%)	10(43.5%)
Overweight( 23-25)	20 (10.3%)	31 (12.4%)	20(13.1%)	11 (11%)	5 (33.3%)	3 (13.3%)
Obese (> 25)	22 (11.3%)	44 (17.6%)	26 (17%)	23 (23%)	3 (20%)	4 (17.4%)
Under weight (below 18)	56 (28.7%)	66 (26.4%)	43 (28.1%)	17 (17.7%)	2 (13.3%)	6 (26.1%)
Waist to hip ratio: cm						
Low risk *	16 (8.2 %)	7 (2.8%)	8 (34.8%)	7 (30.4%)	3 (20 %)	1 (4.3%)
Moderate risk **	26 (13.3%)	35 (14.0%)	16 (26.2%)	11 (18.0%)	2 (13.3%)	5 (21.7%)
High risk ***	20 (10.3%)	169(67.6%)	60 (31.7%)	54 (28.6%)	5 (33.3%)	13 (56.5%)
Normal****	133(68.2%)	39(15.6%)	69 (40.1%)	28 (16.3%)	5 (33.3%)	4 (17.4%)
Abdominal Overweight : (>80cm) & (>90 cm)	25 (12.8 %)	75 (30%)	32 (32%)	33 (33%)	6 (40.0%)	6 (26.1%)

\*0.80 & 0.95 or below, \*\* 0.81 to 0.85 &\*\*\* 0.96 to 1.0+

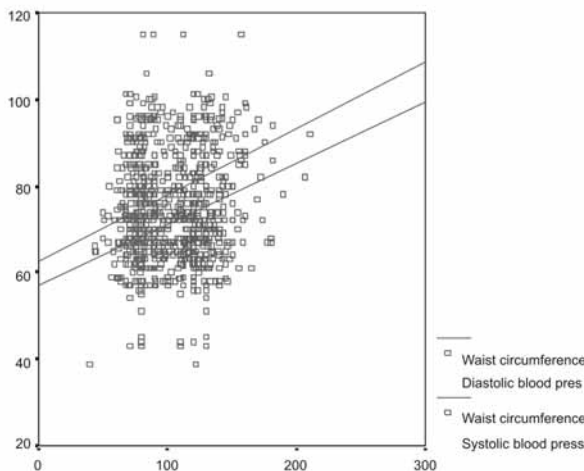
Linear regression analysis was done to find out the correlation between general adiposity i.e. BMI and SBP and BMI and DBP, a positive relationship ( $r=0.226$ ) was observed between SBP and Body mass index and based on the t-value (4.872) and p-value (0.001). Similarly it was found positively correlated between DBP and BMI ( $r=0.183$ ) based on t value (3.923) and p-value (0.001) as shown in Figure 1.

**Figure1: Correlation between BMI, SBP and DBP among Nomad Tribal Population**



Binary Linear regression analysis was observed between abdominal circumference and SBP and DBP. There was found a strong positive correlation for SBP. ( $r = .215, p= 0.001$ ) and DBP ( $r=.163, p = 0.001$ ) Figure 2.

**Figure 2 Scatter plot diagram to show the correlation between waist circumference, systolic and diastolic blood pressure**

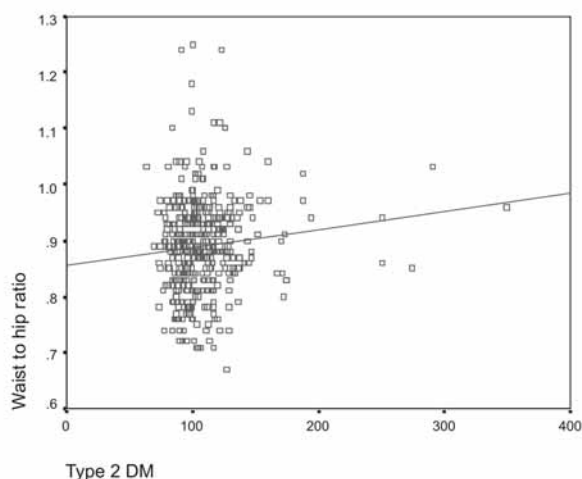


Although correlation between increasing body mass index( $r=0.09, p=0.05$ ),Waist circumference( $r=0.08 p= 0.07$ ) and the prevalence of type 2 DM disease was observed positive but it was not found as strongly correlated as with the incidence of hypertension.

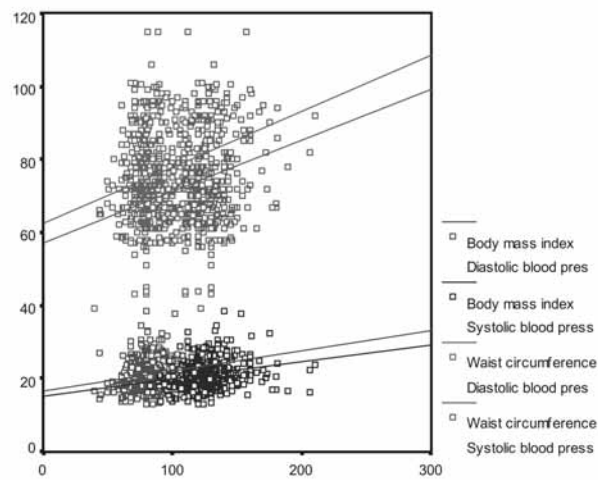
Logistic regression analysis was done to correlate the relationship between waist to hip ratio and with the incidence of type 2 DM among Tribal population. It was found to be highly correlated ( $r=0.109$ ) based on t-value (2.305)  $p= 0.022$  as shown in Figure 3. Whereas the value of regression was not giving significant

correlation with Systolic i.e. ( $r = .084$ ,  $t = 1.778$ ,  $p = .076$ ) and Diastolic blood pressure ( $r = -.034$ ,  $t = -.719$ ,  $p = .473$ )

**Figure 3: Correlation between W/H ratio and type 2 DM.**



**Figure 4 Correlation between BMI and WC with hypertension.**



### DISCUSSION

The association of BMI, WC, and W/H ratio with incident type 2 DM and hypertension were confirmed in our study by significant logistic regression analysis. When comparing the associations with these indicators - BMI and WC and W/H ratio, the body mass index (57.3%) was found to be strongly associated with hypertension (including both overweight and obese category) and waist to hip ratio ( $r = .109$ ,  $p = .022$ ) was correlated strongly with positive blood glucose test. Waist circumference was also found to be correlated strongly with hypertension ( $\chi^2 = 8.559$ ,  $p = .014$ ,  $df = 2$ ) as compared to diabetes.

Ford et al. (19) support the use of WC as a measure of obesity to predict health risk. Among their arguments are that WC has been shown to be a good or better predictor than BMI of the metabolic syndrome, diabetes, cardiovascular disease, and all-cause mortality. It provides information about health risk in addition to body mass index; and it is conceptually easy to measure, although it does require some training and standardization. However, others have noted that substitution of BMI by WC as an indicator of risk for cardiovascular disease and diabetes may be an oversimplification. (20, 21, 22) Some counter arguments nonetheless prove that waist circumference is strongly correlated to body mass index ( $r \sim 0.08$ ) (19, 23, 24.) Our study also supported that BMI and WC ( $r = 0.05$ ) (Fig 4) were strongly correlated with each other and both predicts the same results for hypertension.

Other indicators have been suggested to describe fat distribution associated with abdominal obesity i.e. W/H ratio (22) In our analysis, we had also included W/H ratio as it was the most common obesity-related predictor of diabetes and it has a weaker correlation with body mass index than waist circumference. However, some have argued against the use of W/H ratio as a measure of obesity because of its ambiguous biologic interpretation, its lesser sensitivity to weight gain, its greater variability across age, sex, and ethnic groups, and its greater computational complexity and interpretation in a public health context. (22)

### CONCLUSION

The present study demonstrated consistently strong associations between body mass index versus waist circumference and waist circumference versus waist to hip ratio. It also showed positive association with type 2 diabetes and hypertension. Finally we can conclude our study by saying that all the indicators were strongly associated with each other and Body mass index and waist circumference had strong association with hypertension than diabetes. Waist to hip ratio had also positive association with hypertension but had strongly correlated with diabetes.

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# Agnathia- Otocephaly - A Case Report

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## ABSTRACT

History of an aborted female fetus of 22 weeks gestation was examined. This was the second pregnancy having produced for the 22 years old mother, the first pregnancy having produced a normal healthy child after a full term. Prenatal ultrasound scanning revealed multiple anomalies, considered nonviable for the fetus and hence the pregnancy was terminated. The fetus was examined externally and CT and MRI scan was done. Diagnosis was made as otocephaly.

**Keywords:** Otocephaly, Agnathia, Holoprosencephaly

## INTRODUCTION

Otocephaly is a rare lethal syndrome, with an incidence of 1 in 70,000 newborns. Microstomia, aglossia, Agnathia, and synotia are characteristic features. It is the most severe form of the so-called first-arch anomalies. Arrest in the development of the first branchial arch due to insult to the neural crest cells was suggested cause of this malformation.

## MATERIAL METHODS

Fetus was collected from gynecology and obstetrics department of smt. Kashibai Navale medical college Pune. Through examination of the fetus was done. USG and CT and MRI scan was done. Diagnosis was made of Agnathia with Otocephaly

## FINDINGS

On gross examination it was found that

- 1) Crown ramp length was 16cm
- 2) Head circumference was 12.5 cm
- 3) In place of face there was snout like projections
- 4) No eyes or orbital cavity was seen
- 5) Mouth (stomatodeum) and mandible and any other parts of face like cheeks were completely absent
- 6) Two external acoustic meatuses were present close to midline around which ill formed auricles were seen
- 7) Neck was short, undeveloped and webbing of neck was seen

- 8) Right upper limb shows long arm and very short forearm and hand was flexed and adducted. The right hand shows absence of thumb, only four digits were present. Right forearm showed absence of radius and thumb, so no formation of wrist joint

- 9) Left upper limb was normal

- 10) Trunk on gross examination was normal

- 11) Both lower limbs shows Talipes Equinovarus

- 12) Umbilical cord showed single umbilical artery

The scalp was removed to expose

- 1) Top of skull showing a) anterior bone b) posterior bone articulating at coronal suture.
- 2) Metopic, lambdoid and sagittal sutures were absent
- 3) No fontanelle was present
- 4) When skull was traced anteriorly no orbit were found and it showed complete flat surface

On USG examination it was found that

- 1) Single live intrauterine fetus in changing lie
- 2) Fetal movements and cardiac activity were present
- 3) Oligohydraamnios
- 4) AC was 166mm
- 5) Femur length 38 mm
- 6) Expected fetal weight – 464 gm
- 7) Average gestational age – 22 weeks 2 days

CT and MRI scan showed rare congenital variation of forebrain system ,

( no lobes and no fissures ) sulci and gyri were absent. There was complete absence of median longitudinal fissure , single brain without sulci and gyri was seen – holoprocencephaly was characteristic features

## DISCUSSION

H.-H. Lin<sup>1</sup> also reported a case of otocephaly which has similar features like us. H.H. Lin reported otocephaly, using two-dimensional and three-dimensional ultrasound at 24 weeks of gestation. Two-dimensional ultrasound had revealed polyhydramnios, absence of a stomach shadow, hypotelorism and a proboscis-like mass. Three-dimensional ultrasound had given a precise demonstration of the striking craniofacial features of otocephaly including agnathia, synotia, microstomia and protuberance of the nose-mouth fusion <sup>(1)</sup>

Book health grades of America<sup>(2)</sup> also mentioned about Otocephaly syndrome: A rare, fatal disorder characterized mainly by the absence of a jaw as well as other abnormalities. The disorder usually involves other severe birth defects. Death occurs as a result of the inability to breath properly due to the structural defects.

Symptoms of Otocephaly syndrome are

1. Small mouth
2. Absent jaw
3. Breathing problems
4. Ears position towards middle of the face
5. Death <sup>-(2)</sup>

Between 1915 and 1925, the Bureau of Animal Industry at the USDA maintained a number of guinea pig strains for genetics research, and this 1933 paper\* by Sewall Wright<sup>(3)</sup> describes the appearance of, and inheritance patterns associated with, “otocephalic monsters” in one inbred strain (“family 133”) of these rodents. First, Sewall described the range of severity of this congenital defect, from the mild form, with slight reduction in the size of the lower jaw (mandible), to the most severe form, with complete absence of the jaws, nose, eyes, and brain (rostral to the medulla). In humans, this anomaly is referred to as agnathia-otocephaly, characterized by absence of the mandible and tongue, a small mouth, and positioning of the ears close to the

midline; fortunately, it is quite rare, with an incidence of 1 in 70,000 newborns (Schiffer et al., 2002). The 80 cases published since the first description of agnathia-otocephaly by Kerckring in 1717 have been classified according to the presence of cyclopia and an abnormal brain (holoprocencephaly), or presence of a normal brain in the fetus. Wright had also demonstrated strong hereditary tendency toward otocephaly in the strain of guinea pigs under consideration is neither a matter of toxemia of the mothers of the monsters, nor of cytoplasmic transmission, nor of conditioning of the egg by its nucleus before maturation and fertilization. It is, on the contrary, a function of the heredity of the egg after fertilization<sup>(3)</sup>

Ona Faye-Petersen<sup>(4)</sup> with his colleagues presented five new cases of otocephaly, the largest published series to date, with comprehensive review of the literature and an update of research in the etiopathogenesis of this malformation complex. One of their cases had situs inversus, and two had presented with unexplained polyhydramnios. Otocephaly, while quite rare, should be considered in the differential diagnosis of this gestational complication<sup>(4)</sup>

## CONCLUSION

In this fetus we found complete absence of tongue, mouth, lower jaw ( mandible) ,eyes ( orbit) anomalous ears were midline close to skull- hence name otocephaly brain shows absence of median fissure and sulci and gyri – holoprocencephaly. Cause for this anomaly is definitely genetically as proved in studies with guinepigs.



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# A One year Study of the Adequacy of Primary Prophylaxis in Prevention of Glucocorticoid-Induced Osteoporosis in Rural Western Uttar Pradesh

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## ABSTRACT

**Introduction:** Fragility fractures are well known & serious complication of long-term treatment with corticosteroids. Glucocorticoid-induced osteoporosis (GIOP) is characterized by rapid bone loss and increased fracture risk in the early stages of beginning of therapy and is amenable to proper preventive measures. Thus, glucocorticoid-induced bone loss should be treated aggressively. The aim of this study is to probe the adequacy of primary prophylaxis for glucocorticoid-induced osteoporosis (GIOP) in patients taking long-term steroids.

**Methods:** A retrospective study was conducted in our institute to assess treating doctor's awareness and preventive measures taken during treatment against GIOP. Hospital records of patients receiving  $\geq 7.5$  mg/day of oral steroids for  $\geq 3$  months were studied and relevant data was collected. Primary preventive measures instituted against GIOP were noted and the data was analyzed.

**Results:** Two hundred and three patients, 121 females and 82 males, fulfilling the inclusion criteria were included in this study. Of the 203 patients, 61 did not receive any prophylaxis, 97 received inadequate prophylaxis and only 45 were given appropriate prophylaxis.

**Conclusions:** The awareness about instituting primary preventive measures against GIOP among treating doctors is highly unsatisfactory. There is an urgent need to increase awareness and knowledge of GIOP management. There are effective strategies for prevention and treatment of GIOP & these should be used aggressively in such patients.

**Keywords:** Steroids, Glucocorticoid-induced Osteoporosis (GIOP), Prophylaxis

## INTRODUCTION

Glucocorticoid-induced osteoporosis (GIOP) is a significant public health issue. Up to 1% of adults are treated with glucocorticoids (GC) and GC increases the risk of fracture, even with doses of prednisone as low as 2.5 mg/day<sup>1</sup>. GIOP is an undertreated condition having wide-reaching consequences. Glucocorticoid-

induced osteoporosis is characterized by rapid bone loss and increased fracture risk in the early stages of beginning of therapy and is amenable to proper preventive measures<sup>2,3</sup>. After treatment stops, the fracture risk rapidly falls towards baseline unless the patient was taking long-term therapy. The high frequency and rapid onset of corticosteroid-related fractures necessitates prompt identification of at-risk patients (Table 1). Repeated efforts, if possible, should be made to reduce the dose of corticosteroids or discontinue long-term therapy. However, recognition, prevention and management of GIOP by treating doctors in clinical practice has remained grossly inadequate<sup>4</sup>. This study has attempted to check and find out the awareness and the preventive measures adopted by the treating physicians in patients taking long term steroids in our institute.

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**Table 1. Clinical factors that may shift an individual to a greater risk category for glucocorticoid-induced osteoporosis<sup>5</sup>**

Low body mass index
Parental history of hip fracture
Current smoking
3 or more alcoholic drinks per day
Higher daily glucocorticoid dose
Higher cumulative glucocorticoid dose
Intravenous pulse glucocorticoid usage
Declining central bone mineral density measurement that exceeds the least significant change

**MATERIALS AND METHOD**

The data available in the records of computerized pharmacy system of our institute was used to identify the patients who were prescribed oral steroids between 1st January 2010 and 31st December 2010. Only patients who were prescribed oral glucocorticoids were included in the study. Those under the age of 12 years and those who took the steroids intermittently were excluded from the study.

Information regarding the patients (age, sex), dose administered, duration of glucocorticoids therapy and the diagnosis for steroids prescription were collected from the case records available. Only patients who received a minimum dose 7.5 mg or more for the 3-month duration were further analyzed for osteoporosis prophylaxis.

The guidelines of American College of Rheumatology (ACR) for prevention and treatment of GIOP were used as gold standard (Table 2). Concomitant prescription of osteoporosis prophylaxis like calcium, vitamin D, bisphosphonate, calcitonin and hormone therapy was observed.

**Table 2. ACR Recommendations on counseling for lifestyle modification and assessment of patients starting glucocorticoids at any dose with an anticipated duration >3 months<sup>5</sup>**

Weight-bearing activities
Smoking cessation
Avoidance of excessive alcohol intake (>2 drinks per day)
Nutritional counseling on calcium and vitamin D intake
Fall risk assessment
Baseline dual x-ray absorptiometry
Serum 25-hydroxyvitamin D level
Baseline height
Assessment of prevalent fragility fractures
radiographic imaging of the spine or vertebral fracture assessment for those initiating or currently receiving prednisone >5 mg/day
Calcium intake (supplement plus oral intake) 1,200-1,500 mg/day
Vitamin D supplementation

**RESULTS**

During the period 1st January 2010 through 31st December 2010, 636 patients received oral corticosteroid therapy. 53 were below 12 years and hence excluded from the study. Out of remaining 583, 203 (34.82%) received 7.5 mg or more of oral prednisolone per day for 3 months or longer. The categorization of patients according to specialties involved and the diagnosis of disease were tabulated in Table 3. These details were analyzed for the study.

The age of the patients in the study group (n = 203) ranged from 12 to 83 years (mean 50.5 years). There were 121 females (59.6%) and 82 males (40.4%). Out of 121 females, 51 (42.1%) were post-menopausal. 47 patients (23%) in the study group were above the age of 60 years.

Among the 203 patients, 61 (30%) did not receive any prophylaxis. This group includes 29 (47.5%) females and 32 (52.5%) males. It also includes 16 patients aged more than 60 years (16/47, 34%) and 11 post-menopausal women (14/51, 27.5%).

Out of the remaining 142 in whom prophylaxis was considered, only 45 (31.7%) patients were given appropriate prophylaxis which includes bisphosphonates along with supplemental calcium and vitamin D. 97 patients (68.7%) received calcium and/or vitamin D without bisphosphonates. Further, 13 of 97 patients who were given only calcium and vitamin D had advanced renal impairment and contraindicated bisphosphonate usage. Only 12 postmenopausal women (12/51, 23.5%) received bisphosphonate therapy in addition to calcium and vitamin D.

**Table 4.** Eventually in 142 out of 203 patients (70%), proper primary prophylaxis was either not given or given inadequately. None of the patients were advised BMD-DEXA study.

**Table 3. Specialty wise break-up of patients studied Disorders in patients who received steroids for long-term (≥ 3 months)**

Rheumatologic disorders	57
Respiratory disorders	41
Renal disorders	29
Endocrine disorders	22
Skin disorders	19
GIT and Liver disorders	16
Miscellaneous	19
<b>Total</b>	<b>203</b>

**Table 4. Outline and results of the study**

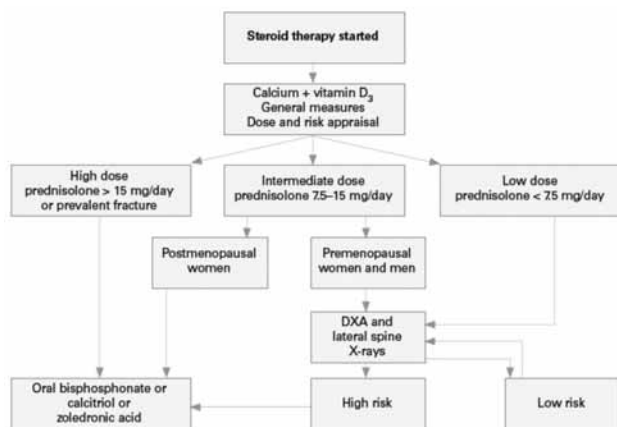
	No. of Patients	Percentage
Total number screened	636	
Age < 12 years- Excluded	53	
~Included in the study	203	
Female : Male	121 : 82	60% : 40%
Postmenopausal patients	51	42%
>60 Years patients	47	23%
*Any prophylaxis given	142	70%
No prophylaxis given	61	30%
BP (bisphosphonates) not given	84	59%
BP contraindicated	13	9%
BP given	45	32%
BP needed-not given	97	69%

\*Any prophylaxis: calcium and/or vitamin D and/or bisphosphonates

~Inclusion criteria: patients aged > 12 years and on oral steroids for ≥ 3 months and steroid dose equivalent to prednisolone ≥ 7.5 mg/day

**Table 5. Recommended monitoring for patients receiving prevalent glucocorticoid therapy for a duration of >3 months<sup>5</sup>**

Consider serial bone mineral density testing
Annual height measurement
Assessment of incident fragility fracture
Assessment of osteoporosis medication compliance
Consider annual serum 25-hydroxyvitamin D measurement



**Fracture prevention for patients starting corticosteroids<sup>6</sup>**

## DISCUSSION

Glucocorticoids are widely used in the treatment of patients with chronic noninfectious inflammatory diseases, especially asthma, chronic lung disease, rheumatoid arthritis and other connective tissue diseases, inflammatory bowel disease, and in organ transplantation. The beneficial anti-inflammatory and immunosuppressive effects of glucocorticoids

necessitate their use, adverse side effects like propensity to cause infections or hyperglycemia is well recognized but, their ability to cause osteoporosis and fractures is often neglected. Osteoporosis and related fractures are one of the most serious adverse effects. Indeed, glucocorticoids are the most common cause of drug-related osteoporosis. The bone loss is fast, often occurring within the first 3–6 months of the start of therapy and tends to affect the cancellous bone more frequently than cortical bone. Bone loss is usually higher at skeletal sites such as vertebral bodies, ribs and distal radius, but it also occurs in cortical bone in the upper femur. A strong correlation between the cumulative corticosteroid dose and decreases in spine and hip BMD was also noted<sup>7,8</sup>. In patients taking 7.5 mg or more prednisolone per day, the risk of non-vertebral fractures can increase by as much as 54% in the first year of therapy compared to the baseline<sup>9</sup>.

Pathogenesis of steroid-induced osteoporosis is complex. These drugs can cause fractures by reducing bone formation and the viability of osteoblasts and osteocytes, the inhibitory effects of corticosteroids on osteoblasts are likely to be critical. It is also known that fractures with steroids seemingly occur with relatively well preserved bone density<sup>10</sup>. This means that apart from affecting the bone quantity, steroids have effects on the bone quality as well<sup>11</sup>.

Primary prevention means starting bone protective therapy at the same time as glucocorticoid therapy. Many international guidelines regarding evaluation (Table 5) and treatment of GIOP have been developed. These guidelines indicate that the use of >5mg for 3 months or longer warrant a DEXA scan to diagnose bone loss and to start prophylactic therapy<sup>5,6,12-14</sup>. Life style changes like prevention of excessive smoking, alcohol and regular weight bearing exercises should be advised. Calcium and vitamin D should be given to all but one should also consider bisphosphonates. Alendronate, risendronate, etidronate and zoledronate are presently approved for individuals taking steroids. Teriparatide (human recombinant PTH) has also been recently found effective in steroid related osteoporosis but since it is expensive and entails daily subcutaneous injections, it is used only if bisphosphonates are either contra-indicated or ineffective<sup>2,15</sup>.

Our study revealed some glaring deficiencies. Up to 70% patients who deserved primary osteoporosis prophylaxis were either not given any or were given inadequate prophylaxis. This has also been the experience of similar studies elsewhere. The audit by Gera and Vij from a tertiary care teaching medical institution in India have also pointed out the poor risk assessment and unacceptably low use of bone protective therapy in 56% of their study group<sup>16</sup>. Sadat-Ali et al.,

in a study from Saudi Arabia found that 60–80% of patients on long term steroids received only calcium and vitamin D but none received anti-resorptive therapy<sup>17</sup>. Ungprasert et al. have reported from Thailand that only 5.8% patients in their study received appropriate evaluation and management of GIOP<sup>18</sup>. Our results are in consistent with another similar Indian study conducted by Nagaraj Srinivasulu et al, where 71% of the patients were either not given proper primary prophylaxis or given inadequately<sup>19</sup>.

Glucocorticoids are important drugs in clinical practice. Steroid prescriptions constitute 30% of prescriptions of private health care providers in India<sup>20, 21</sup>. The epidemiology of GIOP is difficult to ascertain in India due to wide variations in the rationality of steroid prescriptions and due to the prevalence of dispensing practices (where drug names are not disclosed)<sup>21</sup>. The study by Hart and Green noted a lack of awareness about GIOP prevention among physicians prescribing steroids, further suggesting that GIOP prophylaxis should be promoted by local hospital guidelines to the physicians and pharmacists, and their implementation should be monitored through regular audits<sup>22</sup>.

To rectify this deficiency in our institution, we have requested our pharmacist to give a pink colored cap to all patients being prescribed oral steroid medications. We have presented this study and sensitized both treating doctors and nurses to this problem. On seeing the cap the nurse has been advised to bring it to the notice of the treating doctor, who could in turn plan prophylaxis if needed.

To conclude, steroid-induced osteoporosis is a preventable condition. Any patient needing more than 7.5mg/day of steroids for more than 3 months needs prophylaxis. Our study confirms that even at a medical college hospital, the awareness is low and needs drastic improvement.

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**Conflict of Interests:** None

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# Study of Incidence of Asymptomatic PAD In Type 2 Dibetics in a Rural Tertiary Care Center in Southern Most India

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## ABSTRACT

The aim of our study was to establish the high prevalence of undetected, asymptomatic peripheral arterial disease in type2 diabetes in asymptomatic patients in the community. The study included 100 patients and equal number of controls, with 71% women in study group (78% in control).

Age of the control group was statistically significantly higher (51.7 +\_6.3 vs 61.3 +\_9.1 yrs p <0.001). Among the study patients 24% had ABI <0.9 compared to 4% in control group though age wise control group was older and had more chance of age related atherosclerosis, thereby proving the higher incidence of peripheral vascular disease in diabetic patients, even in the absence of symptoms.

**Keywords:** PAD: Peripheral arterial disease, ABI: Ankle Brachial Index, DM: Diabetes Mellitus.

## INTRODUCTION

Peripheral arterial disease has an important health care problem due to high incidence and prevalence as well as its complications. A number of clinical and

epidemiological studies have shown the association of cumulative PAD incidence with patient age and diabetes duration.

Study	Incidence	Prevalence
Framingham (n=4317) <sup>1,2</sup>	Claudication M=12.6/1000yrs F=8.4/1000yrs	18.8(diabetes duration 16yrs)
UGDP (n=619) <sup>3</sup>		Palpation. M=34.5%. F=37.6% Claudication. M=37.7%. F=24.3% (diabetes duration 13yrs)
Rochester (n=1073) <sup>4</sup>	Pulse :M=21.3/1000yr. F=17.6/1000yrs	15.0% (diabetic duration 10 yrs)45% (diabetic duration 20y)
Kristianstand (n=374) <sup>5</sup>		Pulse : 16.4 (DM duration 1.5yrs)38.7 (DM 20yrs)
Munchen (n=623) <sup>6</sup>		Ultrasound: M=18.0% F=14.4%
Oxford (n=186) <sup>7</sup>	Claudication 16/1000yrs	
Pittsburg (n=657) <sup>8</sup>		M=11.0% F=>30% (DM duration >30yrs)
Zagreb (n=200) <sup>9</sup>		Plethysmography: 15%-DM duration 5yrs 18.5%- duration 10yrs 21%- duration >20yrs

Asymptomatic Peripheral Arterial Disease (PAD) is defined as Ankle- Brachial Index (ABI)<0.9 in patients with no clinical evidence of PAD or foot ulcer.<sup>10</sup> ABI <0.9 has got 90% sensitivity and specificity <sup>10,11</sup>. Low ankle brachial index is a predictor of future myocardial events, strokes and amputations<sup>12,13</sup>. Though prevalence of peripheral arterial disease is high in diabetics, as far as we could collect data, there are no study looking into

the presence of asymptomatic peripheral arterial disease in diabetic patients from southern India. We undertook this study to look into the association of uncomplicated (clinically) diabetes with asymptomatic peripheral artery disease as evidenced by low Ankle-brachial index (<0.9). The association was assessed after exclusion of the classical risk factor, ie, smoking.

## Aim of the study

Aim of the study was prove the hypothesis that many of the peripheral arterial diseases in diabetics remain undetected due to lack of symptoms thus leading to complications. We also wanted to call the attention of policy makers into the issue for stronger guidelines on the detection and treatment of asymptomatic PAD in type2 diabetes, which will require larger community based studies.

## STUDY DESIGN AND METHOD

The study subjects were males and females with diagnosed type2 diabetes for more than

one year. We selected 100 type2 diabetics attending medical OP in a rural tertiary care centre (Sree Mookambika Institute of Medical Sciences, Kulasekharam, Tamilnadu, South India). Patients with established peripheral artery disease, with symptoms suggesting peripheral artery disease like claudication, with established coronary artery disease and smokers were excluded. All the patients were already on treatment with oral anti diabetic drugs with reasonable control. Patients taking insulin regemes were excluded for uniformity. Treatment regimen included one drug two drug or three drugs as required. Diabetic treatment was not altered for the study purpose.

Ankle Brachial Index (ABI) was measured using BP apparatus and hand held Doppler equipment by an experienced technician under supervision of a physician. Blood sugars and HbA1c was done to assess diabetic control of the patients. (Only those with reasonable control, ie HbA1c <8 were included).

100 non diabetic patients attending general medical OP for other complaints were selected as control, taking care to exclude smokers in them. Those with hypertension and metabolic syndrome were not excluded. Those with coronary artery disease or cerebrovascular diseases were also not included in control.

Statistical analysis was done with SPSS statistical package.

The study did not include any modification in treatment or disease modifications. The results were informed to the patients and possible cardiovascular risk explained to those with low ABI. Informed consent was obtained from patients as well as controls.

## FINDINGS

A total of 100 diabetic patients and 100 non-diabetic controls participated in the study. All the 100 patients were diabetics with more than one year history of

detected type2 DM. Of the 200 people for whom ABI was measured, 28(14%) had values less than 0.9. The prevalence of low ABI was significantly higher in diabetics – 24 vs 4 %. In the univariate analysis age, hypertension, obesity and metabolic syndrome were all associated with low ABI.

**Table 1. Age distribution**

	DMN =100	Non diabetic N=100	p value
Age	51.7 (+_6.3)	61.3 (+_9.1)	<0.001

**Table 2. Asymptomatic PAD evidenced by ABI<0.9**

	Total (n=200)	Diabetic (n=100)	Non diabetic (n=100)
ABI <0.9(%)	14	24	4

**Table 3 : Sex distribution. (number with ABI <0.9 in bracket)**

	Diabetic n=100 (ABI<0.9)	Nondiabetic n=100 (ABI<0.9)	Total n=200 (ABI<0.9)
Women	78 (20)	64 (3)	142(23)
Men	22 (4)	36 (1)	58(5)

## CONCLUSIONS

1. Peripheral artery disease is fairly common in type-2 diabetes patients, both men and women.
2. Most elude detection due to absence of symptoms even with severe blood flow limitation.
3. The fact that even though asymptomatic, these patients are also at high risk of developing ischaemic complications like diabetic foot underlines the importance of their detection.
4. Larger multicenter studies are required to underline the importance of detection of asymptomatic peripheral artery disease in diabetes

## DISCUSSIONS

According to the data we were able to collect this is the first study to look into the association of asymptomatic PAD in diabetics without clinical cardiovascular disease or cerebrovascular disease in South Indian population.

One previous study<sup>11</sup> investigated the prevalence of asymptomatic PAD in metabolic syndrome without cardiovascular disease (7.5 vs 2.3 in metabolic syndrome and nonmetabolic syndrome). Another study<sup>14</sup> looked into the association of metabolic syndrome with history of cardiovascular disease to low ABI, 14% had low ABI while 10% of those without metabolic syndrome had low ABI. Yet another study of peripheral artery disease



in diabetes<sup>17</sup> reported 12.6% incidence of asymptomatic PAD.

Classical risk factors are frequently associated with low ABI<sup>21-23</sup>. Many conditions associated with diabetes like low HDL, high triglyceride, high LDL, metabolic syndrome etc are associated with high incidence of low ABI and PAD. Age the traditional risk factor for peripheral arterial disease was seen to increase incidence. However in our study, the diabetic population was younger than the general population.

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#### Conflict of Interest

Though ABI may establish the diagnosis of asymptomatic PAD the guidelines for the treatment of such patients is lacking. Hence we feel that more studies need to be conducted in this field and criteria for their screening and treatment need to be formed.

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# Risk Factors of Type 2 Diabetes Mellitus in Middle and Elderly Urban Population of Hyderabad City

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## ABSTRACT

**Background:** Type 2 Diabetes is one of the major public health problem in India. Diabetes can affect nearly every organ system in the body, it can cause blindness, lead to end stage renal disease, lower extremity amputations, and increased the risk for stroke, ischaemic heart disease, peripheral vascular disease and neuropathy.

**Objectives:** 1.To finds the prevalence of type 2 diabetes in Urban Population of Hyderabad City 2. How the obesity associated with the Diabetes Mellitus

**Methodology:** A Cross sectional community based study was conducted during March 2003 to Feb 2004 at the field practice area of Osmania Medical College, the urban health centre Harrajpenta. A cluster sampling method was used a total of 502 individuals were participated and interviewed with pre-structured proforma.

**Results:** The prevalence of the Diabetes Mellitus in the present study was 19.5%. Diabetes Mellitus steadily increases with age ( $X^2=12.24, df=3, p=0.0066$ ). Type 2 Diabetes Mellitus significantly associated with duration of exercise ( $X^2=4.37, 1df, P=0.03$ ), family history of Diabetes ( $X^2=136.1, 4df, p=0.001$ ), Body mass index ( $X^2=58.18 3df, p<0.001$ ).

**Keywords:** Diabetes prevalence-Age-Duration of Exercise-Family history-BMI.

## INTRODUCTION

Diabetes Mellitus, long back considered a disease of minor significance to World Health, is now emerging as one of the main threats to human health in the 21<sup>st</sup> century<sup>1</sup>. The past two decades have seen an explosive increase in the number of people diagnosed with diabetes worldwide. The world health organization (WHO) estimated that there were 135 million diabetics in 1995 and this number would increase to 300 million by the year 2025. The prevalence of diabetes is steadily increasing worldwide particularly in the developing countries.

India currently has the world largest diabetic population with an estimated 19.4 million people. This is expected to be 57.2 million by 2025. Hyderabad is the diabetic capital of the country with every sixth person being diabetic<sup>3</sup> prevalence 16.6%. Type 2 Diabetes mellitus is the commonest form of diabetes seen worldwide. This form of diabetes is considered as life style disease. The underlying genetic predisposition gets unmasked in the presence of the environmental factors such as sedentary life style, change in traditional food habits from coarse simple meals to highly refined caloric dense food, large amount of carbohydrate consumption and stress of urban living.

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This is causing great concern since the cost of treating diabetes is becoming a serious drain on health resources.<sup>5</sup> In type 2 diabetes mellitus the risk of some of these complications (eg coronary artery disease), may start even before the onset of diabetes. Diabetes are 25 times more likely to develop blindness, 17 times more likely to develop kidney disease, 30-40 times likely to undergo a major amputation, 2 – 4 times chances of

developing myocardial infarction and two times chance of stroke with diabetes<sup>6,7,8</sup>.

Diabetes mellitus exhibits the Iceberg phenomenon, where the unknown morbidity exceeds the known morbidity. The disease itself is insidious in onset, with vague symptoms of malaise, polydipsia, polyphagia and polyuria. The diagnosis is established either during a routine health check up or when the patient presents with complications.

Several factors have been implicated in the aetiology of diabetes mellitus. These include geographic, ethnic considerations, genetic, socio economic, socio cultural and dietary patterns, nutritional status, sex and biological agents. In many extensive studies no single factor has been identified in the causation. Thus, prevention of diabetes mellitus or delay in onset of diabetes mellitus even in a single patient represents a triumph to the health care system and national economy.

### OBJECTIVES

1. To find the prevalence of type 2 diabetes in Urban Population of Hyderabad City
2. To know the some known risk factors associated with the Type 2 Diabetes Mellitus

### MATERIAL & METHOD

The present study was carried out in the urban health centre area Harrajpenta, Hyderabad for a period of one year from March 2003 to Feb 2004 (including analysis and conclusions). A Cross sectional community based study was conducted among the 35 years and above general population of field practice area of Osmania Medical College. The urban health centre Harrajpenta, functions under Municipal Corporation of Hyderabad, state Government of Andhra Pradesh. The area of urban health centre has divided into 33 underdeveloped slums and 8 developed slums and covers a total population of 58,902.

In this study "cluster sampling" method was used. This urban health centre has fulfilled certain characteristics of cluster sampling methods i.e. urban health center population has more than 50,000. Instead of villages or hamlets this was divided into developed as well as underdeveloped slums and the clusters should be more than 30. Hence, this area was selected and cluster sampling method was used.

In cluster sampling method, initially found the sample interval, which can be obtained by dividing the total number of clusters to the total population or cumulative population of the urban health center area

and found the sample interval was 1784. Hence, this value fallen in 1<sup>st</sup> slum area and to get the 2<sup>nd</sup> cluster add this value to the first cluster population. Similarly to get the 3<sup>rd</sup> cluster, sample interval plus 2<sup>nd</sup> cluster number and so on. That's how clusters are made till the required number of clusters (33).

### Selection of the Households

In each cluster, first reached the centre of the slum where the 3 or 4 roads are meeting on each other. There selected the one of the lane by lottery based after giving the lanes number. Even in the lane also picked up a random number from currency note to start the house hold survey. If the random number is 3, then the survey started from the 3<sup>rd</sup> house onwards. In one house we got 3 eligible age group persons then taken the history of all the three persons. If there are no eligible age group persons in the house, then moved to another house till get the required sample in each cluster.

### Calculation of sample size

Sample size for this study can be drawn from prevalence of diabetes mellitus on Hyderabad urban population published in Indian journal of medical research March 2003 article by ICMR. In this study prevalence was shown to be 16.7%, and allowable error taken as 20% and formulae<sup>13</sup> used here is  $4PQ / L^2$ . A pilot study was conducted and tested and the actual study was started after making necessary corrections and advises in it. A total of 502 patients or persons were screened for diabetes mellitus and preventive measures were suggested to them during the one year period.

**Diagnostic Criteria:** As per the American diabetes association, whose fasting blood sugar more than 126 mg/dl with symptoms can be considered as Diabetic individual. Necessary statistical tests like Percentages, chisquare test and Z tests were applied for statistical analysis.

### RESULTS

**Table:1. Prevalence Of Diabetes Mellitus In The Study Population**

Among Study Population	No of cases	Prevalence per 100 study population
Diabetic people	98	19.5%
IGT	57	11.35%
Normal people	347	69.15%
Total	502	100%

DM - Diabetes Mellitus, IGT- Impaired glucose tolerance.

The present study was conducted on 502 individuals selected in Urban community by cluster sampling method and examined over a period of one year. Of these, the prevalence (old and new cases) of

Diabetes mellitus was 19.5% (98/502). About 11.3% (57) were found to be impaired glucose tolerance people and 69.1% (347) people have normal glycaemic status.

**Table 2. Distribution of Diabetes Mellitus in relation to the Socio-demographic Characteristics:**

Age wise:

Age of the study population	DM present		DM absent		Total		Statistical Tests X <sup>2</sup> =12.24,df=3,p=0.0066
	No.	%	No.	%	No.	%	
35-44	13	10.0	117	90.0	130	100	
45-54	46	21.2	171	78.8	217	100	
55-64	28	27.7	73	72.3	101	100	
e"65	11	2.03	43	79.7	54	100	
Total	98	19.5	404	80.5	502	100	
Sex wise							
Male	48	18.2	217	81.8	265	100	X <sup>2</sup> =0.71,1df,P=0.39
Female	50	21.1	187	78.9	237	100	
Total	98	19.5	404	80.5	502	100	

**Table 3: Distribution of Diabetes Mellitus in relation to certain risk factors:**

Family History	DM present		DM absent		Total		Statistical Tests X <sup>2</sup> =12.24,df=3,p=0.0066
	No.	%	No.	%	No.	%	
Diabetes Mellitus family members	57	63.7	33	36.3	90		Relative risk 38.6, Odds ratio 15.6 X <sup>2</sup> =136.1,4df, p=0.001
Other diseases family members	41	9.9	371	90.1	412	100	
Total	98	19.5	404	80.5	502	100	
Body Mass Index							
<18.5	01	14.3	06	85.7	07	100	X <sup>2</sup> =58.18 3df,p<0.001
18.5-24.99	34	10.1	298	89.9	332	100	
25-29.99	57	37.5	95	62.5	152	100	
30≥	06	54.5	.5	45.5	11	100	
Total	98	19.5	404	80.5	502	100	
Duration of exercise							
≤30min/day	18	38.2	29	61.8	47	100	Relative risk 38.2, Odds ratio 2.48; X <sup>2</sup> =4.37,1df,P=0.03
>30min/day	12	20	48	80	60	100	
Total	30	28	77	72	107	100	

## DISCUSSION

The present study was conducted at the urban health centre Harrajpenta, urban community of Hyderabad during the period of one year from March 2003 to Feb 2004. A total of 502-study population were examined of whom 98 (19.5%) were found to be diabetes mellitus and 57 (11.3%) were found to be impaired glucose tolerance group. The prevalence of the diabetes mellitus in the present study was 19.5% and similar finding was observed with Ramachandran A, Snehathatha C et al<sup>3</sup> found the prevalence was 16.6% in Hyderabad. Similarly, according to Bai PV, Krishna Swamy CV et al the prevalence was found to be 17.4% in Chennai Urban Population. This study has concordance with the Kutty

VR et al<sup>16</sup> who observed a prevalence of 16.9% in Tiravananthapuram Urban Population. Wesk SK Munoz B et al found to be 21.4% in the age group of 40 yrs and above.

The prevalence of type 2 diabetes mellitus in this study was higher among females at 21.1%, than males at 16.2%. However, this difference was not statistically significant (P > 0.05). Several other researchers have had similar findings. Asha Bai PV, Murthy BN et al<sup>23</sup> found the prevalence was 10.5% in females aged > or = 40yrs and 9.2% in males and in the prevalence of Diabetes mellitus and females was stastically significant (P < 0.05). Misra A, Pandey RM et al<sup>24</sup> conducted a study in Delhi and they opine that diabetes

mellitus was recorded in 11.2% of males and 9.9% of females. Some of the other studies show no gender difference. Ramachandram A et al concluded that prevalence of diabetes mellitus does not have any gender difference.

In the present study, among exercise practicing people 30.6% prevalence of diabetes was observed and 69.4% prevalence observed in exercise not practicing people. The association between the practice of exercise and diabetes mellitus was statistically significant ( $p < 0.05$ ). Several other researches found the same results. Naeem AG conducted study in Kashmir men and stated that exercise inversely related with diabetes mellitus. Ramachandran A, Snehalatha C et al<sup>17</sup> stated that diabetes mellitus indirectly related with the duration exercise. According to Ferry J<sup>14</sup> stated that persons who were undergone physical activity less than half an hour per day were inversely related with diabetes mellitus.

Among diabetics, 58.2% were giving family history of diabetes and significantly associated with the type 2 diabetes mellitus in the present study. Several researchers found the same finding i.e. 53.1% were giving family history of diabetes.

This finding was correlated with De Silva SN, Weerasuriya N et al<sup>19</sup> (2002) conducted a study in Srilanka, Oneyemere KV, Lipton RB et al<sup>25</sup> conducted a study in Chicago and concluded that a positive parenteral history of DM appears to be more strongly related to childhood type 2 than type 1 Diabetes Mellitus. A similar finding was observed with the Ramachandran A, Snehalatha C et al<sup>20</sup> found that families with a positive family history of diabetes significantly associated with the type 2 diabetes mellitus.

Body mass index (BMI) is very important tool in the measurement of obesity. In the present study, 54.5% of diabetics were in 30 plus range, 37.7% of diabetics were in 25-29.99 ranges, 10.1% of diabetics were in 18.5-24.99 range and 14.2% of diabetics were in <18.5 range. Prevalence of type 2 diabetes mellitus associated with the high BMI ( $>25\text{kg}/\text{m}^2$ ) and statistically significant ( $\chi^2=58.18$ ,  $p < 0.001$ ). This study correlated with the Vikram NK, Misra AD et al<sup>18</sup> conducted a study in New Delhi and defined that cut offs for defining obesity by BMI are lower than the suggested limit of  $25\text{ kg}/\text{m}^2$ . Most of the studies revealed that BMI associated with type 2 diabetes.

**Conclusions:** Based on the above results, simple life style modifications like practicing exercise and correction of obesity would decrease the burden of type 2 Diabetes Mellitus some extent in the future among the general population especially in the age group of 35 years and above group both in males and females.

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# Neoplastic Breast Lesions- A Histopathological Study with Special Emphasis on Histological Grading

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## ABSTRACT

**Background and objectives:** Breast neoplasms are the most common tumors affecting the women. This study was undertaken with an overall aim to explore the different aspects of breast tumors as one of the commonest neoplasia in women, particularly the histopathological features with special reference to histological grading.

**Materials and methods:** A prospective study was done in the department of Pathology, from June 2008 to May 2010. The specimens were collected from patients clinically diagnosed as having masses and histopathologically as tumors. All these lesions were classified according to World Health Organization classification.

**Results:** Hundred and ten cases were studied and data were analysed. All patients were females. Of the total 110 breast tumors, 62 (56.36%) cases were benign, One (00.90%) ca-in situ, and 47 (42.72%) were malignant. Fibroadenoma was the commonest among benign tumors. Of the malignant lesions studied 38 were infiltrating ductal carcinoma (80.85%), four (08.51%) were malignant phylloides, two (04.25%) were medullary carcinoma, two (04.25%) were lobular carcinoma and one (02.12%) was tubular carcinoma. Majority of malignant tumors were of grade I. ER/PR was positive in 16/22 cases. HER2/neu was positive in 3/22 cases.

**Conclusion:** Morphological variants of invasive cancer have different biological outcomes. Distinguishing these heterogeneous forms of breast cancer along with grading is crucial for prognostic prediction. Therefore grading should be included as a component of minimum data set for histological reporting of breast cancer.

**Keywords:** Breast neoplasms, Grading, Phyllodes tumor.

## INTRODUCTION

Breast cancer is the most common malignancy in women, affecting one in eight in the western world. Advances in imaging techniques and the increased use of aspiration needle biopsy have greatly assisted the pre-operative evolution of breast lesions. However in a large proportion of cases, differentiation between benign and malignant lesions still rests on the histological examination.<sup>[1]</sup>

Here it is attempted to study a series of cases of both benign and malignant breast lumps with histological grading of malignant lesions.

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**Materials and method:** This study deals with the determination of incidence and identification of morphologic forms of breast tumors with histological grading. During the period of June 2008 to May 2010, 110 specimens were received for histopathological study. All breast specimens were subjected to a detailed gross examination, tumor size, overlying skin ulceration, nipple and areolar changes and the presence of lymph nodes, their number and size were noted. Formalin fixed and paraffin embedded tissue sections from these specimens were stained with haematoxylin and eosin.

## RESULTS

Of the total of 110 breast tumors, 62 (56.36%) cases were benign, one carcinoma in-situ (0.90%), and 47(42.72%) were malignant. The most common presenting symptoms were breast lump followed by pain and nipple discharge.



Fibroadenoma (93.54%) was commonest among benign tumors, the youngest and the oldest patient with fibroadenoma were 12 and 54 years old. The highest evidence was seen in 21 – 30 years age group. Fibroadenoma were more common in left breast, than right breast.

One case (0.90%) of ductal carcinoma in-situ was noted out of 110 cases.

Among the malignant tumors the youngest patient was 25 years old and the oldest was 65 years old. The highest incidence was found in 41 -50 years age group. Carcinoma was more common in left breast than right breast. Out of 47 breast carcinoma patients, 43 were multiparous while four were nulliparous. For every case of the breast carcinoma, a record of predominantly involved quadrant was also kept. It was found that upper outer quadrant was the most commonly affected quadrant while lower inner quadrant was the least affected one.

Out of a total of 43 mastectomy specimens (all for malignancies) the condition of the nipple, skin and areola was observed. Eight cases (18%) showed nipple retraction, eight (18%) showed puckering of the areola and seven cases (16%) showed skin ulceration. In 20 cases, the skin, areola and nipple appeared normal. The size of the tumors ranged from a minimum of 0.5 cm to a maximum of ten cms, forty-one ranged from 0.5 to five cm, six ranged from five to ten cms in size.

Out of 47 cases of breast malignancies, infiltrating ductal carcinoma not otherwise specified type (NOS) was seen in 38 cases (80.85%) (Fig-1). Tubular carcinoma was seen in one case (2.12%) (Fig 2). Out of 47 malignant lesions, 16 cases showed hemorrhage and 14 cases showed necrosis. Of the four malignant phylloides one tumor showed necrosis and one showed hemorrhage.

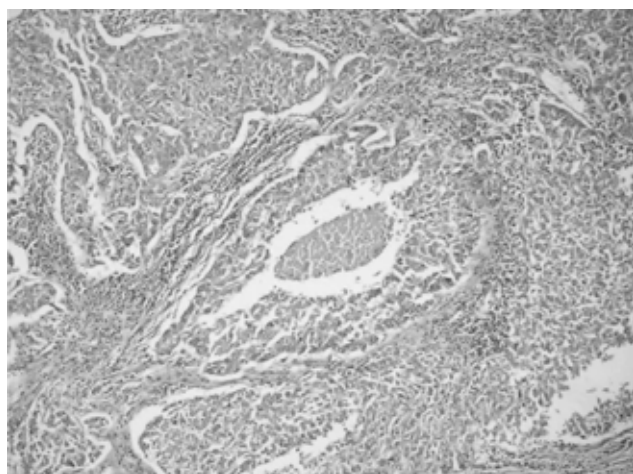


Fig. 1. Infiltrating ductal carcinoma with comedo pattern (H&E, x40)

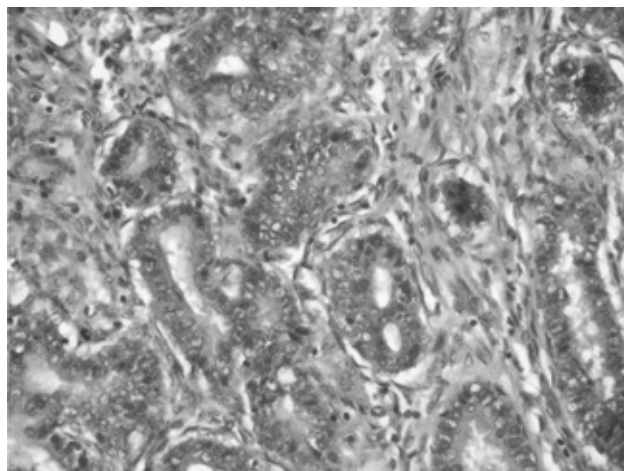


Fig. 2. Tubular carcinoma showing tubules lined by malignant cells (H&E, x40)

Secondary changes like necrosis, hemorrhage, myxoid change and osseous metaplasia were seen in 30 (69%), 09 (20%), 02 (04%) and 01 (02%) cases respectively. Peritumoral lymphocytic infiltration was observed in 36 (83%) of cases. Out of 43 epithelial malignancies tumor deposit in the axillary lymph nodes was seen in 18 cases, 17 showed sinus histiocytosis, 08 showed germinal centre hyperplasia.

Using Elston and Ellis modification of Bloom and Richardson grading system for breast tumors, each case of infiltrating ductal carcinoma (38) in this study was graded (Table-2). As described before, the criteria taken into account for grading were tubule formation, nuclear pleomorphism and mitotic counts. As is obvious from the preceding table, maximum malignancies were of grade I seen in 65.78% of cancers. Of the 47 malignancies, four cases were malignant phylloides tumor (Fig 3) which constituted about 08.51% of the total malignancies.

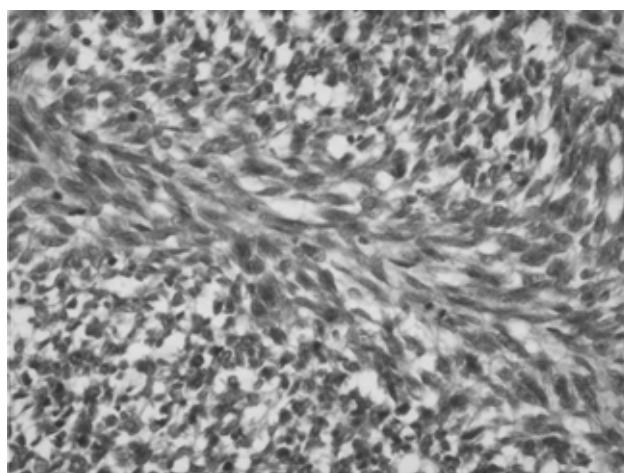


Fig. 3. Malignant phylloides tumor showing fibrosarcomatous component (H&E, x40)

Out of 47 carcinomas studied, seven cases showed involvement of resected margins. Among them five were grade I, one was grade II, and one was grade III. Five of 47 cases showed fat and muscle infiltration (10.63%), three cases were grade I, One case was grade II, and remaining one case was grade III. Among these two cases showed recurrence. Nine cases showed vascular invasion (19.14%) (Fig 4), of which one was grade I, six were grade II, and two were grade III. Perineural invasion was noticed in medullary carcinoma (Fig 5).

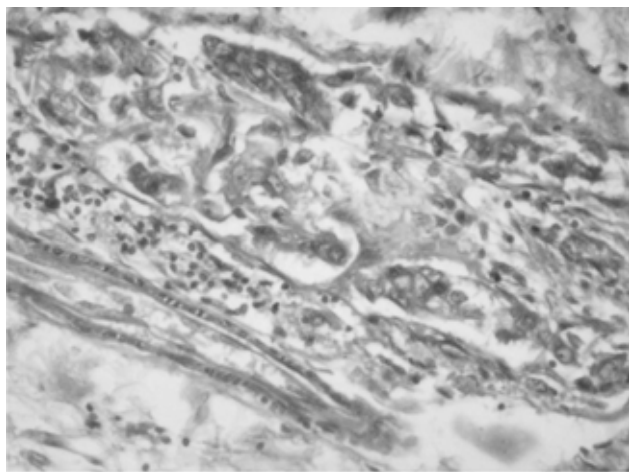


Fig. 4. Infiltrating ductal carcinoma with vascular invasion (H&E,x40)

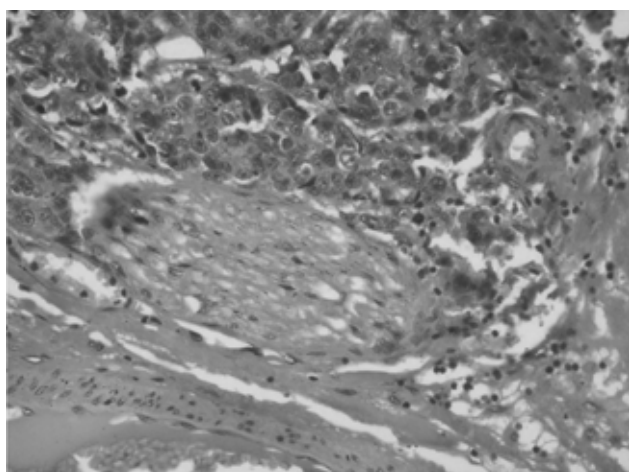


Fig.5. Medullary carcinoma showing perineural invasion (H&E, x40)

ER/PR and HER2/neu was done in 22 cases, of which 16 were ER and PR positive, one was ER negative and PR positive and three were HER2/neu positive and two were ER/PR and HER2/neu negative.

## DISCUSSION

A look at western and Indian literature shows that studies on breast masses are mainly denoted to cancer breast in adults and these do not separately recognize

Table-1. Incidence of malignancy

Histological type	Khanna et al 1998	Hemalatha et al 2005	Present Study 2010
IDC Nos	94.29%	61.71%	81.85%
Medullary Carcinoma	-	7.26%	4.25%
Lobular Carcinoma	1.57%	5.94%	4.25%
Tubular Carcinoma	-	-	2.12%
Malignant phyllodes	2.75%	2.97%	8.51%
Sarcoma	1.37%	-	-

Table-2. Incidence of tumor grade.

Grade	No. of cases	Percentage
Grade I (Well differentiated)	25	65.78%
Grade II (Moderately differentiated)	09	23.68%
Grade III (Poorly differentiated)	04	10.52%
Total	38	100 %

Table-3. Comparison of relative percentage of cases in each grade in different series.

Studies	Histological grade (%) of cases		
	I	II	III
Bloom and Richardson <sup>23</sup>	26	45	29
Wolff et al <sup>23</sup>	33	33	34
Tough et al <sup>23</sup>	11	51	38
Champion et al <sup>23</sup>	23	52	25
Faber et al <sup>23</sup>	11	23	66
Elston <sup>23</sup>	18	37	45
Contesso et al <sup>23</sup>	21	50	29
Present study	65.78	23.68	10.52

the problem of breast disease in young females. Thus, breast lump evaluation remains a challenge.

The incidence of benign neoplasms was 56.36 %, which is consistent with the observation of Pai et al (1999),<sup>[2]</sup> Khanna et al (1998),<sup>[3]</sup> and Hemalatha AL et al (2005).<sup>[4]</sup> The variation in incidence may be attributed to geographical variations of the area under study.

The incidence of malignant neoplasms was found to be 42.72 %. The findings are consistent with the study of Pai et al (1999),<sup>[2]</sup> Khanna et al (1998),<sup>[3]</sup> and Hemalatha AL et al (2005).<sup>[4]</sup>

The duration of symptoms before clinical presentation ranged from 15 days to three years. The average duration is much higher compared with the western literature. Lack of awareness, education and the regrettable influence of alterative medicines and superstitions in Indians results in late seeking of

medical advise when the disease especially the malignancies are already in the advanced or sometimes inoperable stage.

The most common presenting symptom was breast lump followed by pain and nipple discharge. Debra A Bell et al in 1983, quoted as over 80% of patients presented with a lump or mass.<sup>[5]</sup>

Most commonly patients have diffuse nodularity with pain leading to clinical diagnosis of fibrocystic disease.<sup>[6]</sup> Pain in breast cancer is mainly attributed to brachial plexus nerve involvement.<sup>[7]</sup> In the present study, 4.54% of patients presented with nipple discharge which is a consistent observation made by other authors too.<sup>[5]</sup>

Fibroadenoma was the most common benign tumors. It constituted 93.54%. Similar observations were recorded by Kuijper Arno et al in 2001.<sup>[8]</sup> The youngest patient with fibroadenoma was 12 years and the highest incidence was seen in 21-30 years age group. Similar observations were recorded by Khanna et al in 1998.<sup>[3]</sup> Age incidence of fibroadenoma in the present study is consistent with other authors' observation too.<sup>[3]</sup> It can be speculated that fibroadenomas are the outcome of an exaggerated hormonal response.<sup>[3]</sup> The eldest patient with fibroadenoma was 54 years which is also observed by other authors also.<sup>[8]</sup> This can be attributed to as benign lesions which are usually asymptomatic and slow growing and frequently neglected.<sup>[3]</sup>

Three benign phyllodes tumor were noted based on the histological appearance of stromal components. Two cases of benign phyllodes tumor showed a mean mitotic count of 2/10 HPF in the most mitotically active area. Azzopardi does not recommend a specific field area to use for mitotic counts and neither Pietruzka nor Barnes have recorded this information in absolute terms. Comparison of mitotic rates between different series is therefore difficult.<sup>[9] [10]</sup>

There were 47 cases of malignant neoplasms constituting 42.72%. Hemalatha et al in 2005 quoted a incidence of 37.93%,<sup>[4]</sup> Pai et al in 1999 quoted 48.4% of malignant neoplasms,<sup>[2]</sup> Khanna et al in 1998 quoted 38.7% of malignant tumors.<sup>[3]</sup> All the above findings by different authors is consistent with the present study.

The youngest patient with malignant neoplasms of the breast was 25 years and the highest incidence was found in 41 – 50 years age group.

Khanna et al, in 1998 revealed the incidence of malignancy in females under 20 years as 2.1%,<sup>[3]</sup> No case was seen in the same age group. It is apparent that the incidence of breast cancer is much higher in middle aged females in the present study as well as other reports

from India.

It has been observed that breast cancer frequency is higher in unmarried nulliparous women than in their married or multiparous counterparts.<sup>[11][12] [13]</sup>

In the present study 43 (91.48%) patients were multiparous while four were nulliparous. In 1960, MaC Mohan and Feinleib studied 258 patients with cancer and equal number of controls and found no significant differences in the two groups of women regarding total duration of nursing.<sup>[14]</sup> Breast feeding is supported to reduce the incidence of breast carcinoma.<sup>[14][12]</sup> The present study also fails to confirm the protective effect of breast feeding as most cases of cancer (91.48%) had breast fed their children. Upper outer quadrant of the breast was most commonly affected and inflammation was seen in 36/47 cases, while the lower inner quadrant was least affected because greatest amount of breast tissue is in upper outer quadrant.<sup>[15]</sup>

The most common type of malignancy was infiltrating ductal carcinoma NOS type seen in 38 cases (80.85%). The least common malignancy was tubular carcinoma seen only in one case (2.12%) (Table-1), ( Graph 1).

The next common carcinoma was medullary carcinoma (4.25%). This observation was also made by McDivitt, Stewart and Berg in 1968 where they have reported medullary carcinoma as a rare entity, with only 5% incidence.<sup>[16] [13]</sup> The next common carcinoma was lobular carcinoma (4.25%). This observation matches the observations of other authors' too.<sup>[4]</sup>

All the infiltrating ductal carcinomas were further classified according to the Elston and Ellis grading system into 3 grades. Of a total of 38 infiltrating ductal carcinomas twenty five cases (65.78%) were grade I, nine cases (23.68%) were grade II and four cases (10.52%) were grade III (Table-3). The grading is usually applied to invasive ductal carcinoma, mucinous and tubular mixed carcinomas, grading provides a more appropriate estimation of prognosis than histologic type alone.<sup>[17]</sup> Acceptable degree of interobserver reproducibility is achieved by Elston and Ellis grading system.<sup>[18- 20]</sup> Significant association between histological grade and survival rate is demonstrated by many studies. Therefore, grading should be included as a component of minimum data set for histological reporting of breast cancer.<sup>[21-22]</sup>

Four cases of malignant phyllodes tumors were noted, based on the histological appearance. According to Pietruzka and Barnes who had reanalyzed Norris and Taylor's data regarded mitotic activity as the most important single variable and diagnosed those tumors which showed ten or more mitotic figures/ 10HPF, had infiltrating margins and 2+ or 3+ nuclear atypia as

malignant tumors.<sup>[9]</sup> In the present study of malignant phyllodes tumors all cases showed a mean mitotic count of 10/10 HPF. Comparison of mitotic rates between different series is therefore difficult.<sup>[9-10]</sup>

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# Hard Fibroma-A Rare Case Report

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## ABSTRACT

**ABSTRACT:** Small circumscribed mesenchymal lesions of the oral mucosa are of frequent occurrence<sup>1</sup>. Fibroma is a non-neoplastic enlargement of the gingival which arise from the gingival connective tissue or from the periodontal ligament. They are slow growing; a spherical tumor that tends to be firm & nodular but may be soft and vascular and usually pedunculated<sup>2</sup>. Hard fibromas of the gingival are rare. We report a rare case of hard fibroma in a 65- year old male. Clinical, radiographic and histopathological features along with etiopathogenesis and differential diagnosis are also discussed.

**Keywords:** *Hard fibroma, Irritational fibroma, True fibroma*

## INTRODUCTION

By definition, fibroma is a reactive hyperplastic mass. That occurs on the gingival and is believed to be derived from the connective tissue of the sub mucosa or periodontal ligament<sup>3</sup>. Such lesions are describe as a fibromas, fibro epithelial polyps, inflammatory fibrous hyperplasia's, fibrous epulides and other titles<sup>1</sup>. The fibroma may occur at any oral site, most commonly it is seen in buccal mucosa along the plane of occlusion. Other frequent sites are the gingival, buccal mucosa, tongue, lips and palate. It is likely that many gingival fibromas represent fibrous maturation of the pre-existing gynogenic granuloma<sup>4</sup>.

The lesion typically appears as a smooth surface, pink nodule that is similar in color to the surrounding mucosa. In black patients the mass may demonstrate gray brown pigmentation. In some cases the surface may appear white as a result of hyperkeratosis from continued irritation. Most fibromas are sessile / pedunculated. They range in size from tiny lesion to several centimeters. Most fibromas are 1.5 centimeter or less in diameter, irritation fibromas are most common

4<sup>th</sup> to 6<sup>th</sup> decades of life. The prevalence rate is 1:2 in males and females. The lesion usually produces no symptoms unless secondary traumatic ulceration of the surface has occurred<sup>4, 5</sup>.

**Case report:** A 65-years old male patient reported to the outpatient department with a chief complaint of a mass in left upper posterior region in palatal aspect and he noticed since from one month. The lesion started as a small painless swelling from the interdental papilla of left upper 2<sup>nd</sup> and 3<sup>rd</sup> molars, gradually increasing and attains the present size, with no history of bleeding, parasthesia and pain. The medical history was not contributory.

Intra-oral clinical examination revealed a solitary swelling measure about 1.5X1.5 cm, roughly rounded in shape present over the palatal region of 27&28. The size extending extending from antero- posteriorly from mesial line angle of 27 to distal to 28 and medio-laterally 1.2 cm away from the mid palatal raphe to upto marginal gingival of 27 & 28. The overlying mucosa was lobulated, normal in color, and showed no ulcers, vascular markings (fig 1).

On palpation the inspectory findings were confirmed. The swelling was hard in consistency, pedunculated, nontender and no bruit or pulse was felt. Considerable deposition of sub and supra gingival calculus and deep periodontal pocket was present and grade I & II mobility in relation to 27 & 28 respectively.

On the basis of history and clinical features a provisional diagnosis of irritational fibroma was given. The list of differential diagnosis included chronic

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fibrous epulis, pyogenic granuloma, peripheral giant cell granuloma, peripheral odontogenic fibroma, osteosarcoma.<sup>4,5</sup>

The investigatory work up included pulp sensitivity test, complete hemogram, intra oral radiographs and excisional biopsy of the lesion. Involved teeth responded within normal limits to electric pulp testing. Routine hematological investigation values were also found to be within normal limits. Intraoral periapical radiographic in relation to 27&28 represents soft tissue shadow extending from distal surface of 27 to the maxillary tuberosity area, along with angular bone loss up to middle third of distobuccal root and up to apical third of mesiobuccal root of 28 (fig 2).

The excisional biopsy (fig 3) was performed under local anesthesia and H&E stained section revealed hyperplastic stratified squamous epithelium overlying dense fibrous connective tissue. The connective tissue shows **dense collagen fibers running throughout the lesion** with few infiltrates and blood vessels. Thus, a final diagnosis of hard fibroma was given (fig 4).

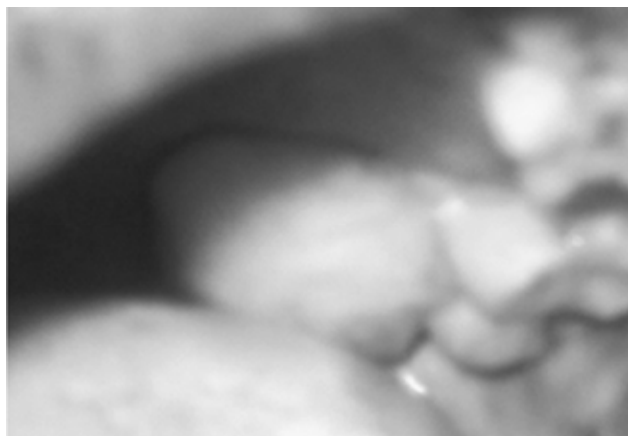


Fig. 1: Photograph showing the lesion arising from the interdental papilla of 27 & 28.

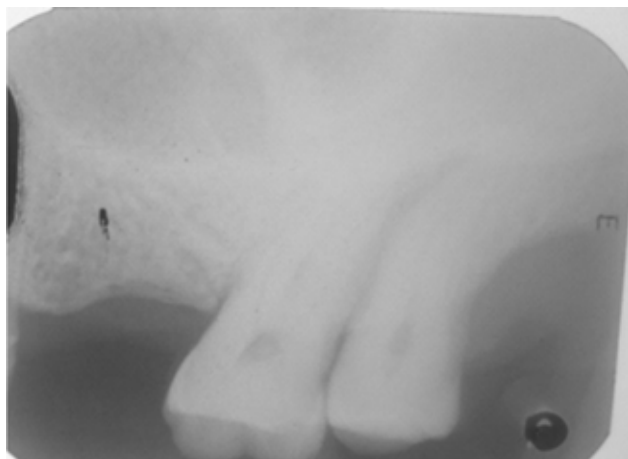


Fig. 2: Radiograph of the case



Fig. 3. photograph showing the excised tissue

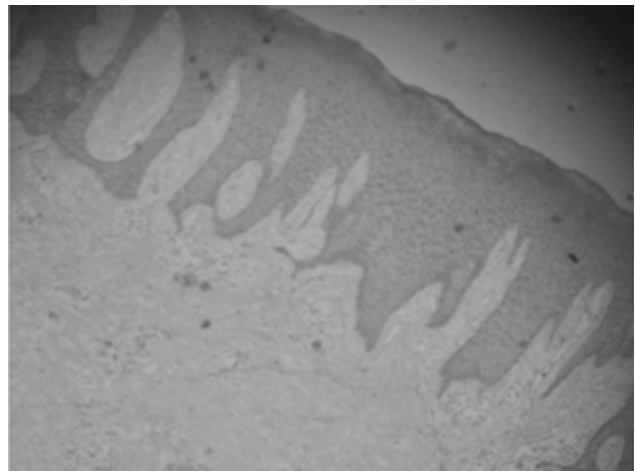


Fig. 4: H-E staining  $\times 10$  excised tissue

## DISCUSSION

It is generally accepted that circumscribed mesenchymal lesions of the oral mucosa which initially are quite vascular and/or contain many inflammatory cells, gradually lose these inflammatory features and become densely collagenous. Such lesions are described as fibromas, fibro epithelial polyps, inflammatory fibrous hyperplasias, fibrous epulides and other titles.<sup>1</sup>

Stones H.H was first to coined the term hard fibroma in 1941 which is similar in appearance to fibro epithelial polyps and exhibited the histologic features of true fibroma<sup>6</sup>.

The etiopathogenesis of fibroma is unclear. Trauma or local irritants such as sub gingival plaque and calculus, dental appliances, poor-quality dental restorations, microorganism, masticator forces, food lodgment and iatrogenic factors all influence the development of the lesion<sup>7</sup>. As **in our** case the etiology is periodontal ligament cells. An origin from cells of

periodontal ligament has been suggested because of exclusive occurrence of fibroma from interdental papilla, the proximity of gingival to PDL, the presence of oxytalan fibers' within the mineralized matrix of some lesions, and the fibro cellular response similar to other reactive gingival lesions of periodontal ligament origin<sup>7</sup>. Deep pockets, sub gingival deposits, all are considered as a predisposing factor in etiopathology.

Most fibromas are sessile / pedunculated. They range in size from tiny lesion to several centimeters. Most fibromas are 1.5 centimeter or less in diameter. The fibroma is most commonly occurred in 5<sup>th</sup> to 6<sup>th</sup> decayed life and the male to female ratio is 1:2<sup>4</sup>. As in our case the lesion is pedunculated, which ranges from 1.5X1.5 centimeter and it occurs at 65 years old male patient.

Barker and Lucas established criteria by which true fibromas of the oral mucosa can be recognized. There are two groups, the collagen fiber bundles radiated from the base of the lesion is radial type. Another group consists of a central mass of largely unoriented fibers surrounded by a peripheral, circular layer of collagen are central type<sup>8</sup>, as seen in our case. Those having a mark vascular component are designated pyogenic granuloma. Those containing metaplastic osteoid bone and/or cementicles are known as peripheral ossifying (or odontogenic) fibromas or calcifying fibroblastic granuloma.<sup>1</sup> As in our case, the histopathologically represent the connective tissue shows dense collagen fibers running throughout the lesion (central type) with few inflammatory infiltrates, blood vessels and no calcification, suggesting a diagnosis of hard fibroma which is true fibroma.

Treatment of hard fibroma consists of elimination of etiological

factors, scaling of adjacent teeth and total surgical excision along with involved periodontal ligament and periosteum to minimize the possibility of recurrence.

Long term postoperative follow-up is extremely important because of the high growth potential of incompletely removed lesion and a relatively high recurrence rate.

Fibroma clinically resembles as irritational fibroma, fibro epithelial polyp, inflammatory fibrous hyperplasia, peripheral giant cell granuloma or odontogenic tumors, peripheral ossifying fibroma so radiographic and histopathological examination is essential for accurate diagnosis.

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# Aortic Dissection -A Case Report

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## ABSTRACT

**Aortic dissection** : is a catastrophic illness characterized by dissection of blood between and along the laminar planes of the media with formation of blood filled channel within the aortic wall which often ruptures out ward and cause severe hemorrhage.<sup>3</sup> In such cases quick and timely diagnosis can save a life from Aortic catastrophe.<sup>5</sup> Therefore we think it is important to report this case.

**Case Presentation:** This case is young man who presented with pain in abdomen, dizziness and loss of sensation in right hand in Sharda Hospital Greater Noida. The patient was referred to Cardiology Department and Echocardiography was done which suggested the diagnosis of Dissection of ascending aorta with aortic regurgitation. Case was referred for Surgery. Bentall procedure : through sternotomy on CPB was performed and life was saved.

**Conclusion:** Aortic dissection is a fatal condition .A high clinical index of suspicion and correct diagnosis on Echocardiography is essential to save the life. If the patient 's history suggests neurovascular deficit as in our case , non invasive diagnostic procedure such as ECHOCARDIOGRAPHY should be performed promptly to rule out aortic dissection which is life threatening condition.

**Keywords:** Aortic dissection, Echocardiography, intimal tear ,dissection flap ,Aortic regurgitation , DeBakey classification, Stanford classification type A

## INTRODUCTION

**Aortic dissection** is a fatal condition in which there is separation of the aortic walls due to intimal tear which can become larger and lead to bleeding in the walls of aorta which can later rupture and cause sudden death .Prompt diagnosis and management of aortic dissection are key to reduce patient morbidity and mortality.

Aortic dissection occurs when a tear in the inner wall of the aorta causes blood to flow between the layers of the wall of the aorta and force the layers apart and dividing the muscle layers of the aortic wall and forming a false channel or lumen. This channel may be short or may extend the full length of the aorta. A distal (further along the course of the aorta than the initial tear) tear in the intimal layer can let blood re-enter the true lumen of the aorta. In some cases the dissection will cross all three layers of the aortic wall and cause immediate rupture. In most other cases the blood is contained between the wall layers

**DeBakey and colleagues** initially classified aortic dissections as<sup>2</sup>. Type I in which an intimal tear occurs in the ascending aorta but involves the descending aorta

as well, type II, in which the dissection is limited to the ascending aorta type III, in which the intimal tear is located in the descending aorta with distal propagation of the dissection

**Stanford classification** type A, in which the dissection involves the ascending aorta (proximal dissection) type B, in which it is limited to the descending aorta (distal dissection).

Thoracic aortic dissections should be distinguished from aneurysms (localized abnormal dilation of the aorta) and transactions, which are caused most commonly by high-energy trauma.

Complications of a type A dissection may include sudden cardiovascular collapse from cardiac tamponade secondary to pericardial effusion, or massive acute myocardial infarction from dissection of coronary arteries, usually the right coronary artery. Aortic insufficiency may occur due to retrograde dissection into the aortic sinuses or annulus. A dissection may also be complicated by branch artery obstruction resulting in neurovascular deficits, such as stroke, ischemic neuropathy, paraplegia and paresis, limb ischemia, bowel ischemia, and renal failure.



## CASE PRESENTATION

We are presenting a case of Stanford type A aortic dissection in a 27 year old patient with history of mild hypertension. The patient is non diabetic, smoker with no family history of ischemic heart disease.

Patient arrived in Sharda hospital Greater Noida with complaints of pain in abdomen and back pain for last 2 days, dizziness and transient loss of sensation in right hand in the morning.

There was no retrosternal chest pain, shortness of breath, orthopnoea, paroxysmal nocturnal dyspnoea, palpitations, transient ischemic attacks, syncope or pre-syncope. His medications included antihypertensive drugs.

**Physical examination-** The patient was in no apparent distress with a blood pressure of 130/85 mm of Hg in both arms and a regular pulse of 70 and feeble Rt. Radial pulse. There was a left carotid bruit. Femoral pulses were nearly normal bilaterally. Heart sounds were normal with early diastolic murmur present on left parasternal region. There were no signs of heart failure. EKG showed normal sinus rhythm and no evidence of ischemia or previous infarction.

All routine hematology and biochemistry investigations were within normal limits.

**ECHOCARDIOGRAPHY** -A transthoracic - echocardiogram (figure 1&2) performed, revealed Type A aortic dissection with dissection flap in ascending aorta, Mild to moderate Aortic regurgitation, Mild concentric hypertrophy of left ventricle

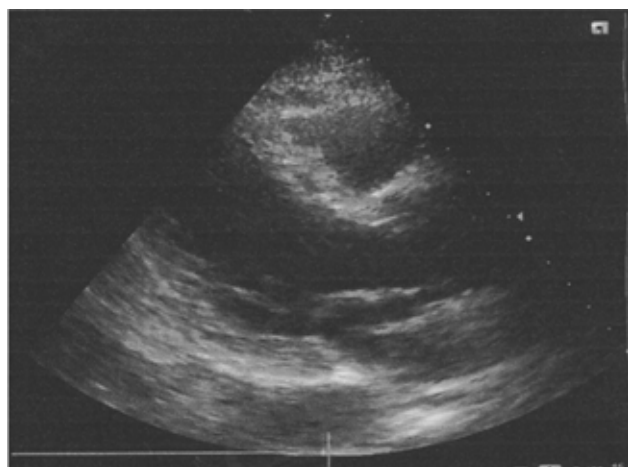


Fig. 1. showing dilated aortic root with dissection flap

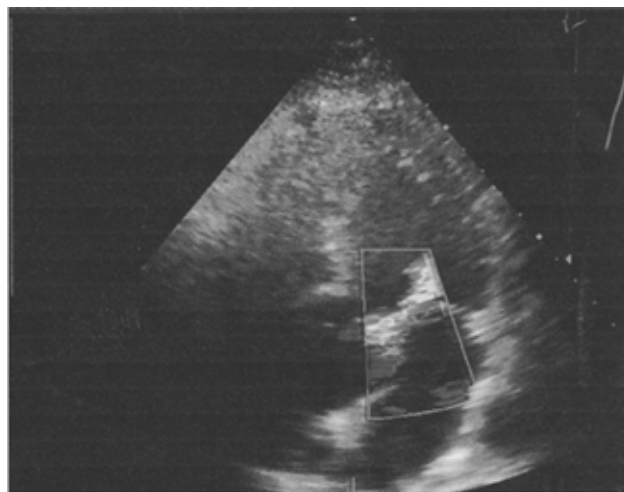


Fig. 2. showing dilated aortic root with AR

## CT Findings

**CT angio aorta (chest & abdomen)** revealed Type A aortic dissection with aneurysmal dilatation of ascending aorta.

## CT Brain plain and Head Plain-Study

Revealed Large hypo dense area with loss of grey and white differentiation in the right fronto temporal lobes and adjoining right ganglio capsule region, with effacement of overlying sulci and right lateral ventricle with contra lateral moderate shift of midline, suggestive of recent infarct in the right Middle cerebral artery territory.

## MANAGEMENT

After Diagnosis patient was immediately transferred to Cardiothoracic Surgeon. Ascending aorta and aortic valve were replaced using composite valve conduit. Coronaries (both) were detached and anastomosed to neo aorta. Distal anastomosis was done under TCA.

Post operatively patient was put on inotropic support (infusion Epinephrin) due to hemodynamic instability, which was gradually tapered off on 1st post-operative day. He was discharged with oral anticoagulant (acitrom), Metoprolol, frusemide, Citicolin and was advised to continue acitrom life long and prothrombin time monthly to keep INR between 2.0-3.0.

## DISCUSSION

Acute aortic Dissection is an uncommon but potentially catastrophic illness, that occurs with an incidence of approximately 2.9/100,000/year with an at least 7000/year in U S A. Early mortality is as high as 1 percent per hour if untreated, but survival may be significantly improved by the timely institution of appropriate medical and / or surgical therapy.<sup>1</sup>

The most important predisposing factor for acute dissection is sudden hypertension. Other predisposing Factors include collagen defects (Marfan syndrome, Ehlers-Danlos disease, annuloaortic ectasia), bicuspid aortic Valve, aortic coarctation, Turner syndrome, coronary artery bypass surgery, previous aortic valve replacement, crack cocaine use, strenuous resistance training and trauma.<sup>5</sup>

In 90-95 % of cases an intimal tear is the primary Event that initiates aortic dissection. It is postulated that thinning of the media due to degeneration of collagen, elastin or muscles within the media (cystic medial degeneration), weakens the intima and predisposes it to tearing. This degeneration may be related to conditions like Marfan syndrome, Ehlers-Danlos disease and other connective tissue diseases. This degenerative process might also be produced by obstruction of the vasa vasora by an atherosclerotic plaque.<sup>6</sup>

Classically, a patient with acute aortic dissection presents with a history of sudden-onset excruciating, "tearing" anterior chest pain with or without radiation to the back. The pain is usually migratory, extending inferiorly along the length of the aorta to the abdomen or flank areas. In patients with chronic dissection, symptoms and signs are frequently related to the presence of an aortic aneurysm, particularly if the aneurysm is enlarging. If further dissection or aneurysm rupture occurs, the presentation may be similar to that of an acute dissection.

In this case, the patient presented with Pain in abdomen for 2 days, dizziness and transient loss of sensation in right hand since morning. The aortic dissection was diagnosed on Echocardiography. CT angiogram also showed same findings. CT Brain findings are suggestive of recent infarct in the right MCA territory.

Surgical intervention was chosen and Bentall procedure through sternotomy was performed

No definite cause of Aortic dissection could be found out. May be mild hypertension was exacerbated due to some cause.

Our case also had complication as neurovascular deficits (transient loss of sensation in right hand) and later paresis of left hand due to infarct in MCA territory.

## CONCLUSIONS

Acute aortic dissection presents with a wide range of manifestations and classical findings are often absent. A high clinical index of suspicion is necessary. Despite recent advances, in-hospital mortality rates remain high.

Thus most common clinical manifestation include cardiac tamponade, aortic insufficiency, Myocardial infarction or extension of dissection in to great arteries of neck or coronaries, renal, mesenteric or iliac arteries, causing critical vascular obstruction.

Our case presented as pain in abdomen, dizziness and mild loss of sensation in right hand. He was diagnosed as aortic dissection by 2-D Echocardiography, Colour flow mapping and Doppler studies. Surgery - Bentall procedure through sternotomy was performed.

Our case also had complication as infarct in MCA territory resulting in neurovascular deficits (loss of sensation in right hand) and hemodynamic instability postoperatively which was corrected by inotropic support (infusion Epinephrin). Later Patient was discharged in satisfactory condition.

Quick and timely diagnosis of Aortic dissection on ECHOCARDIOGRAPHY has saved a life.

**Acknowledgement-** Authors thank Head of Medicine Department and Dean of S.M.S & R, Greater Noida, U.P, India for their kind co-operation and support.

**Conflict of Interest** – None

**Ethical Clearance** – taken

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# An Unusual Cause of Menorrhagia - A Case Report

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## ABSTRACT

Placenta percreta in early pregnancy is rare and only few cases have been diagnosed and documented. We report a case of a woman with history of previous caesarean section who presented with heavy bleeding per vaginum. She underwent first trimester pregnancy termination by medical abortion following which she had regular cycles for 4 months. Sonography revealed features of invasive mole and because of persistent heavy bleeding per vaginum we had to resort to hysterectomy. Histopathological examination revealed a placenta percreta. We must be aware of this rare entity in this era of increasing caesarean section rate as it can lead to significant mortality and morbidity. Therefore, we report this case with a brief review of literature.

**Keywords:** Placenta Percreta, Pregnancy Termination, Menorrhagia

## INTRODUCTION

Placenta percreta is a rare life threatening complication of pregnancy in which the chorionic villi penetrate through the uterine serosa and may invade the surrounding organs. The untoward complication include severe postpartum haemorrhage with its resultant coagulopathy, uterine perforation, shock, infection and even death.<sup>1,2</sup>

Placenta percreta usually presents with excessive vaginal bleeding during difficult placental removal in the third stage of labour. It may even complicate first and early second trimester pregnancy loss causing profuse post-curettage haemorrhage<sup>3,4</sup>. Although antenatal diagnosis may be achieved with ultrasonography (USG) and magnetic resonance imaging (MRI), the diagnosis during early pregnancy is very difficult.

## CASE REPORT

Our patient was a 27 year old woman, Para 1 living 1 with a history of previous caesarean section. She presented with profuse vaginal bleeding for three days. She gives the history of medical abortion 4months back at 6 weeks gestation following which she had regular cycles. Her last childbirth was by lower segment caesarean section 6 years back. At the time of admission, her vitals were stable except for pallor. The laboratory

findings were Hb: 7gms/dl, serum beta HCG 274 miu /ml. Sonography revealed a bulky uterus with 8.6x6x5.6cms intracavitary heterogeneous mass with lots of cystic areas in the body of uterus with poor endometrial and myometrial differentiation and thinned out anterior myometrium (Fig 1). On colour Doppler, increased vascularity was seen within the lesion and the anterior myometrium (Fig 2). Though the HCG level was not grossly elevated, an invasive mole could not be excluded due to the ultrasound findings.

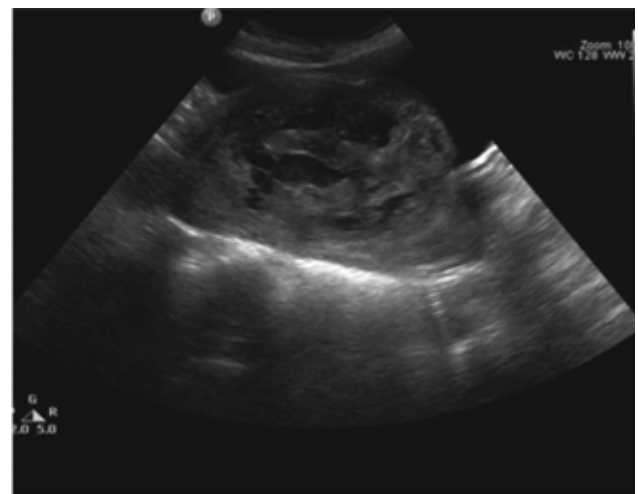
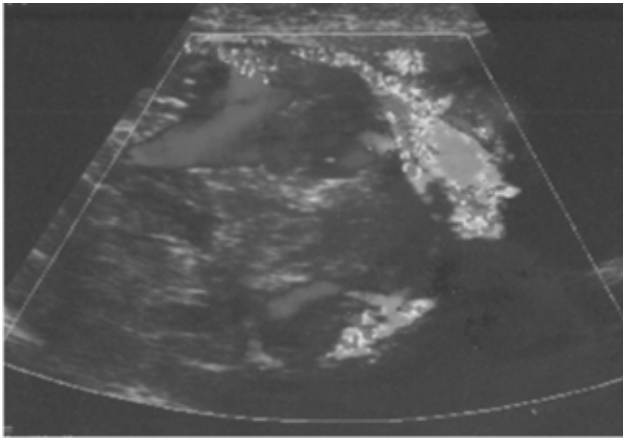


Fig.1 Grey scale ultrasonography showing heterogeneous mass with lots of cystic areas in the body of uterus and thinned out anterior myometrium.

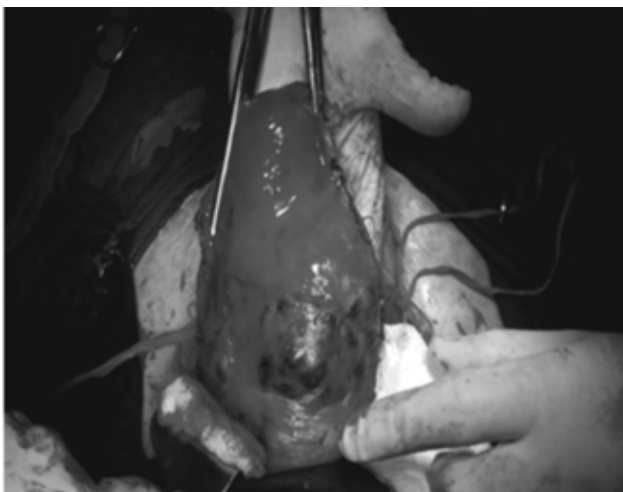


**Fig.2** on Colour Doppler increased vascularity was seen within the lesion and the anterior myometrium

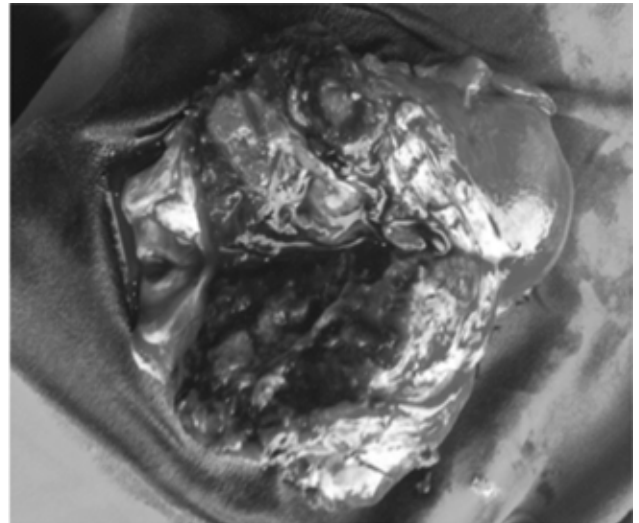
In spite of giving two units of packed cell, there was no improvement in the haemoglobin status. With the suspicion of invasive mole, continuous vaginal bleeding at this stage made emergency hysterectomy a necessity. After obtaining an informed consent, we proceeded with hysterectomy. Intra-operatively a 5x6 cms vascular polypoidal mass was seen protruding through the lower part of the body of uterus at the site of previous scar (Fig 3). However, the bladder was not involved. The total blood loss was around 2 litres and two units of packed cells were transfused intra-operatively. Her post-operative period was uneventful. The patient was discharged in good health on sixth postoperative day.

Macroscopic examination of the specimen showed a 6cms polypoidal dark brown friable tissue obliterating the endometrial cavity seen protruding through the serosa (Fig 4). On microscopy thinned out uterine wall irregularly infiltrated by chorionic villi extending up to serosa, which is consistent with placenta percreta (Fig 5&6).

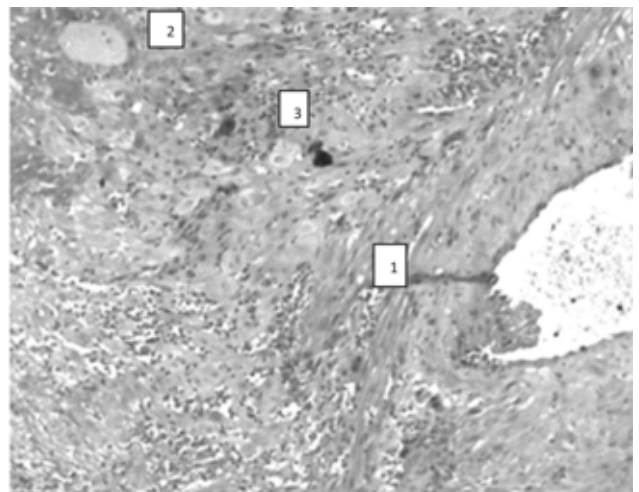
**Fig.3. Intra operative findings**



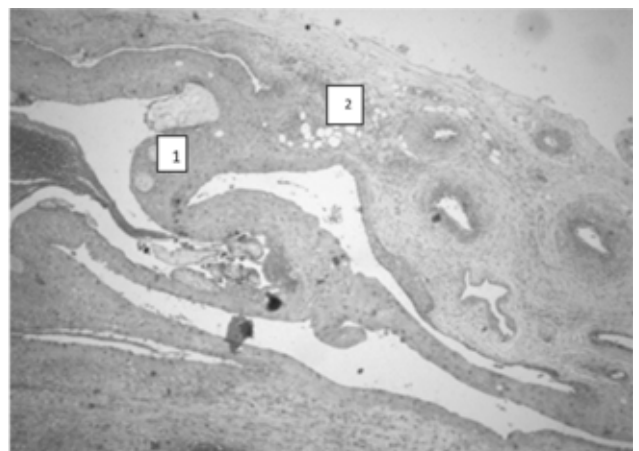
**Fig.3** Vascular polypoidal mass protruding through the lower part of body of uterus at the site of previous scar (black arrow)



**Fig.4** Hysterectomy specimen opened showing placental tissue invading up to the serosa {black arrow}



**Fig. 5.** Histology showing the myometrium(1) with invasion of chorionic villi (2) and decidua cells(3)([400x H&E])



**Fig. 6.** Histology showing chorionic villi(1) infiltrating the serosa(2) [40x H&E]

Histology showing the myometrium(1) with invasion of Histology showing chorionic villi(1) infiltrating the serosa(2) chorionic villi (2) and decidual cells(3)([400x H&E][40x H&E]

## DISCUSSION

Placenta percreta occurs in approximately one in 2500 - 7000 pregnancies, of these approximately 78% are placenta accreta Vera, about 17% are placenta increta, and the remaining 5% or so are placenta percreta.<sup>1,5</sup> Although the overall incidence of placenta percreta is extremely low, the appearance of this rare disorder seems to be increasing in the past five years due to the increasing caesarean deliveries and large number of spontaneous and induced abortions.

Recognised risk factors for placenta percreta include maternal age >35years, previous one or more caesarean sections, history of other instrumentation of the endometrium, manual removal of placenta and multiparity<sup>6,7</sup>.

Mismanagement of any type of placental adhesion can be catastrophic because trophoblastic tissue is highly vascular. Bleeding during attempted surgical intervention may occur because of the invasion of placental tissue into adjacent organs, such as urinary bladder and bowel. Maternal death is not an infrequent outcome ranging from 7-10% of reported cases of placental adhesion<sup>3,6</sup> and foetal death occurs in approximately 9 % of the cases usually because of extreme prematurity at delivery, infection, usually in the postoperative period<sup>2,8,9</sup>. Although commonly discovered at the time of delivery it may even complicate first and second trimester pregnancy loss, causing profuse post-curettage haemorrhage<sup>3,4</sup>. Hence, early recognition of this condition may improve the outcome, since it provides the obstetrician the opportunity to deal promptly with such an obstetrical emergency.

The antenatal diagnosis of placenta percreta may be based on real time ultrasound, Colour Doppler, and Magnetic resonance imaging (MRI). Sonographic findings during the second and third trimester include placental lacunae (vesicular lakes of various shapes and sizes seen within placental parenchyma), a thin myometrium, and a loss of retro placental clear space. Sonography may be used to identify patients at risk for placenta percreta as early as the first trimester of pregnancy. When performed in first trimester will reveal a low-lying uterine sac with a thin myometrium. The placenta is difficult to visualise at ten weeks and earlier,

therefore one of the most reliable sign is not available during that period<sup>10</sup>. Most authors believe MR imaging provide superior anatomic information and diagnostic accuracy<sup>11</sup>. Colour Doppler and power Doppler will often reveal turbulent blood flow extending from the placenta to surrounding tissues increasing the diagnostic sensitivity of ultrasonography<sup>12</sup>.

Treatment for placenta percreta has primarily been surgical, with hysterectomy chosen as the treatment in 98% of all cases according to one large metaanalysis<sup>2</sup>. Conservative management is especially desirable in the rare setting of the involvement of an adjacent organ such as the bowel or bladder because of the increased risk of uncontrollable haemorrhage and for partial placenta accreta where bleeding is minimal.

Conservative treatment includes prophylactic preoperative cannulation or intraoperative uterine or internal iliac artery ligation or angiographic embolisation or balloon catheter occlusion of the iliac vessels, which is implanted preoperatively and inflated during hysterectomy in a patient with placenta percreta and adjuvant uterine curettage with packing have been described<sup>8,13</sup>. Chemotherapy with intramuscular methotrexate have been used with success in several patients<sup>2,9</sup>. In some other cases, conservative procedures like resection of the afflicted area of the uterus<sup>14</sup> and covering of a uterine rupture by Tacho Comb sponge<sup>15</sup> have both been described in order to preserve fertility, however, these are still of an experimental nature. Le-Ming Wang et al described a case of spontaneous uterine rupture secondary to placenta percreta on the posterior uterine wall in woman with previous history of caesarean section at 31 weeks period of gestation. For her they performed bilateral uterine vessel occlusion and wedge resection of the ruptured uterine wall with primary repair of the defect to preserve the uterus successfully<sup>16</sup>.

However, considering fourfold mortality with these conservative treatments as compared to hysterectomy, the latter is usually preferred in emergent situation<sup>17</sup>. Successful treatments depend on immediate blood replacement therapy and prompt hysterectomy. The clinical manifestation of placenta accreta such as bleeding, uterine rupture, invasion of bladder, and uterine invasion depend on the site of implantation, depth of myometrial penetration, and the extent of abnormally adherent placenta<sup>18</sup>. Placenta percreta can cause uterine rupture as early as 9 weeks and the most commonly affected site is fundus in this earlier gestation<sup>19,20</sup>.

Only few cases of placenta percreta in such an early stage of pregnancy had been reported. The Lee et al case report was different in that the placenta increta was diagnosed 50 days after dilatation and curettage due to persistent vaginal bleeding with an elevated beta HCG of 161 IU/ml<sup>21</sup>. The case reported by Roh et al was different in that there was massive acute bleeding immediately after dilatation and curettage<sup>22</sup>. Petek Balkani- Kaplan et al case was different from our case report in that women with a history of previous caesarean section presented with metrorrhagia beginning immediately after pregnancy termination at 7 weeks gestation<sup>23</sup>.

After reviewing through literature this is the first case report of placenta percreta presented with menorrhagia following regular cycles after an extended period from first trimester pregnancy termination. Our case suggests that in women at risk for invasive placentation who have had recent spontaneous or therapeutic abortion and presenting with abnormal uterine bleeding, placenta percreta should need to be considered.

### CONCLUSION

Placenta percreta is an obstetric emergency often with massive haemorrhage leading to emergency hysterectomy causing significant morbidity and mortality. Diagnosis in the early pregnancy remains a challenge. This case has been presented to increase the awareness of physicians and to highlight the clinical features and essentials of management. This unusual presentation need to be known in front of the rising caesarean rate and large number of spontaneous and induced abortions performed worldwide. As most cases of placenta percreta have no preceding symptoms, high degree of suspicion is necessary for its early recognition to improve maternal outcome.

**Conflict of interests-nil**

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# Knowledge about Sexually Transmitted Diseases and HIV among Adolescent Boys in Urban Slums of Mumbai

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## ABSTRACT

**Background:** Adolescents account for one fifth of the world's population and have been on an increasing trend. In India, they account for 22.8% of the population (as on 1st March 2000) according to planning commission. Adolescent is an underserved vulnerable group in India, which needs to be addressed especially by reproductive sexual services to adolescent boys.

**Objectives:** 1. To know the knowledge about the symptoms of Sexually Transmitted Diseases. 2. To find the awareness about the HIV Prevention and Cure.

**Methodology:** This present cross sectional community based study was conducted in Bhabharekar Nagar, Mumbai which was resettlement area for those who were migrated from Kandivali (Charkop). Bhabharekar Nagar was having total of 728 houses and 8 gallies. A total of 256 adolescent boys were selected using stratified random sampling method during the period of May 2005 to April 2006.

**Results:** About 87.5% (224/256) participants had information regarding sexually transmitted infections. 59.82% (134/224) participants said burning micturition as a symptom of sexually transmitted infections. 16.96% (38/224) participants said itching in groin. About 85.9% (220/256) participants said that HIV/AIDS is preventable. 70.3% (180/256) participants said HIV/AIDS is not curable.

**Keywords:** Knowledge about STI, Symptoms of STD, Modes of HIV, HIV prevention, Knowledge about Cure of HIV.

## INTRODUCTION

World Health Organization (W.H.O.) defines adolescence both in terms of age (spanning the ages between 10-19 years) and in terms of life marked by special attributes.<sup>1,2</sup> National Population Policy 2000 of India has defined adolescents as an underserved vulnerable group, which needs to be addressed especially by reproductive sexual services to adolescent boys.<sup>3</sup> Adolescents account for one fifth of the world's population and have been on an increasing trend. In India, they account for 22.8% of the population according to planning commission.<sup>4</sup> Neglecting adolescent population has major implication for the

future, since reproductive and sexual behavior during adolescence have far reaching consequences for people's lives as they develop in to adulthood.<sup>5</sup> This is especially relevant in India where reproductive health has been considered synonymous with women's health and hence reproductive health of men has received little attention.<sup>6</sup>

W.H.O. estimates that 70% premature deaths among adults are due to behavioral patterns that emerge in adolescence, including smoking, violence and sexual behavior.<sup>7</sup> This is unarguably proved that men are victim of their own behavior and risky sexual practices. While girl's sexual behavior is associated with fear and sense of guilt, in boys it is associated with manhood and triumph.<sup>7</sup> Demographic and health surveys data throughout the world find, that boys' age at sexual initiation is decreasing in nearly all countries, while young women's age at first sexual experience had decreased in only about one fifth of these countries.<sup>8</sup>

In recent years, the globalization and liberalization, the rapid spread of communication and information technology and shifting social and moral norms may

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be said to have eroded the traditional bases and defining points for adolescent reproductive and sexual behavior, leading to host of the changes in reproductive health concerns. After sexual initiation, the pattern of adolescent sexual behavior is often erratic and few young people report consistent and correct use of contraception.

According to Ranjha and Hussein, adolescents seek services at sex clinics run by *hakims*, which are more accessible and perceived to be less judgmental.<sup>9</sup> They are often the first place that adolescent seek care. Disadvantage of these *hakims* are lack of vocabulary to address sexual and reproductive health issues, their services reinforced myths and misinformation and bordered on outright quackery. The main issues in adolescent sexual and reproductive health are sexual development and sexuality, sexually transmitted diseases (including HIV) and issue of unwanted and unsafe pregnancies.

### OBJECTIVES

1. To know the knowledge about the symptoms of Sexually Transmitted Diseases.
2. To find the awareness about the HIV Prevention and Cure.

### MATERIAL AND METHOD

This present study was conducted in Bhabharekar Nagar, Mumbai which was resettlement area for those who were migrated from Kandivali (Charkop). Bhabharekar Nagar was having total 728 houses and 8 *gallies*. Exact record of population was not available at health post but estimated population is 4000.

**Study design:** Cross- sectional community based study

**Study period:** May 2005 to April 2006

**Study population:** Adolescent boys in the age group of 14 to 19 years

**Sampling method:** Stratified random sampling method

**Study procedure:** This study was completed under following steps,

#### Step I: Planning for study

Selected study area was visited with social workers so as to know about the community. Members of youth club and volunteers working in the area were contacted and explained about the purpose and usefulness of study.

#### A. Qualitative Data Collection

Focus group discussion (FGD) technique was used for an explorative assessment to gain a better understanding of the personal development.

#### B. Quantitative Data Collection

**Pilot study:** Partially structured questionnaire was prepared to gain more systematic insight in the distribution of knowledge of adolescent boys on selected issues.

#### Step II: Conduct of Study

Sampling method: Stratified random method was used. Bhabharekar Nagar was having 728 houses, with 8 *gallies*. Each and every house was visited personally and all adolescents between the age of 14 to 19 years were enumerated. Out of 272 adolescents, 256 willingly participated in the study during the study period. Confidentiality of their answers was emphasized at the start as the importance of their co-operation was needed for the success of this study.

### RESULTS (FINDINGS)

**Table 1: Knowledge about Sexually Transmitted Infections (STI)**

Knowledge About STI	Total(n = 256)	
	Count	%
No	32	12.5
Yes	224	87.5
<b>Total</b>	<b>256</b>	<b>100</b>

Table 1 reveals that about 87.5% (224/256) participants had information regarding sexually transmitted infections. 12.5% (32/256) participants said they don't know about sexually transmitted infections.

**Table 2: knowledge about Symptoms of STI**

Symptoms of STI	Frequency	Percentage(n = 224)
Discharge per Urethra	22	9.82
Ulcer on Genitals	7	3.13
Itching in Groin	38	16.96
Burning Micturation	134	59.82
Don't Know	80	35.71

Table 2 depicts that 59.82% (134/224) participants said burning micturation as a symptom of sexually transmitted infections. 16.96% (38/224) participants said itching in groin. 9.82% (22/224) participants said discharge per urethra. 35.71% (80/224) participants were unaware about the symptoms.

(\*Multiple responses given by the participants)

**Table 3: Modes of Transmission of HIV**

Modes of Transmission of HIV	Total(n = 256)		
	Count	%	
Sexual	No	13	5.08
	Yes	243	94.92
Blood	No	90	35.16
	Yes	166	64.84
Needles	No	106	41.41
	Yes	150	58.59
Vertical	No	164	64.06
	Yes	92	35.94
Mosquito	No	204	79.69
	Yes	52	20.31
Touching	No	211	82.42
	Yes	45	17.58
Air Droplet	No	218	85.16
	Yes	38	14.84
Kissing	No	197	76.95
	Yes	59	23.05

Table 3 shows that about 94.92% (243/256) participants said that HIV transmits by sexual intercourse. 64.84% (166/256) participants said that HIV can be transmitted by infected blood transfusion. 58.59% (150/256) participants said that HIV transmits by infected needles. 35.94% (92/256) participants said that HIV transmits vertically mother to child. 23.05% (59/256) participants said HIV transmits by kissing. 20.31% (52/256) participants said that HIV transmits by mosquito bite. 17.58% (45/256) participants said HIV transmits by touching to HIV positive person.

**Table 4: Opinion of HIV Prevention**

HIV Preventable	Total(n = 256)	
	Count	%
No	36	14.1
Yes	220	85.9
Total	256	100

Table 4 states that about 85.9% (220/256) participants said that HIV/AIDS is preventable. 14.1% (36/256) participants said that HIV/AIDS is not preventable.

**Table 5: Opinion about HIV Cure**

HIV Curable	Total(n = 256)	
	Count	%
No	180	70.3
Yes	76	29.7
Total	256	100

Table 5 indicates that 70.3% (180/256) participants said HIV/AIDS is not curable. 29.7% (76/256) participants said HIV/AIDS is curable.

**Table 6: Test for Diagnosis of HIV**

Test	Frequency	Percentage (n= 256)
Blood Tests	222	86.72
Sputum Test	30	11.72
Urine Test	44	17.19
X-Ray	16	6.25
Stool Examination	9	3.52
Don't Know	34	13.28

Table 6 depicts that 86.72% (222/256) participants said blood test is necessary for diagnosis of HIV/AIDS. 17.19% (44/256) participants said urine test is necessary for diagnosis of HIV/AIDS. 11.72% (30/256) participants said sputum test is necessary for diagnosis of HIV/AIDS. (\*Multiple responses given by the participants)

**Table 7: Attitude towards persons with HIV/AIDS (N=256)**

Attitude towards HIV patients	No		Yes	
	Count	%	Count	%
Stay With Family	97	37.9	159	62.1
Eat Together	172	67.2	84	32.8
Shake Hands	178	69.5	78	30.5
Marriage	224	87.5	32	12.5

Table 7 reveals that 62.1% (159/256) participants said person with HIV/AIDS can stay with family. 32.8% (84/256) participants said person with HIV/AIDS can eat with others. 30.5% (78/256) participants said there is no harm in shaking hands with HIV/AIDS infected persons. 12.5% (32/256) participants said that persons with HIV/AIDS can marry.

## DISCUSSION

About 87.5% (224/256) participants had information regarding sexually transmitted infections. All this information was from friends and road side banners, and advertisements in local train. When asked about symptoms of sexually transmitted infections 59.82% participants said about burning micturation. Nearly 35.71% (80/224) participants have no knowledge about symptoms of sexually transmitted infections. When asked about prevention of sexually transmitted infections, many were unable to tell it properly, most participants said about abstinence, use of condoms and safe sex. Participants were not able to elaborate meaning of safe sex.

Regarding modes of transmission of HIV/ 94.92% (243/256) were aware that sexual intercourse is responsible for transmission. Many participants 64.84% (166/256) were aware that infected blood transfusion lead to HIV/AIDS transmission. Nearly 58.59% (150/256) participants said that infected

needles can transmit HIV About 35.94% (92/256) participants said that HIV can be transmitted from mother to foetus vertically. Many participants had misconception about transmission of HIV, 20.31% said it can spread by mosquito bite, 17.58% participants said HIV can transmit through touching, 14.84% participants said it can transmit through air droplets, 23.05% participants said HIV can transmit by kissing.

Regarding prevention of HIV, 85.9% (220/256) participants thought that HIV can be preventable. With regard to knowledge of treatment of HIV/AIDS, 70.3% participants said that there is no cure for HIV/AIDS. But 29.7% participants thought that HIV/AIDS can be cured. Regarding diagnosis of HIV/AIDS 86.72% participants knew that blood test is necessary to diagnosis of HIV/AIDS, but they were unable to name the test. About 17.19% participants said that urine test is necessary to make a diagnosis of HIV/AIDS. In relation to attitude towards HIV/AIDS persons, nearly 62.11% participants said that people with HIV/AIDS can stay with the family, but 32.8% (84/256) participants thought that they should eat together with HIV/AIDS patients. 30.5% participants said that there is no harm in hand shaking with HIV/AIDS affected person. But only 12.5% said that person with HIV/AIDS can marry.

### CONCLUSION

About 87.5% participants said they are aware of STIs but exact symptoms were not known to 35.71% participants. Regarding transmission of HIV, 94.92% participants said sexual route is the most common route of transmission. The fact that infected blood transfusion transmits HIV was known to 64.84%. Similarly 58.59% participants said infected needle pricks may lead to transmission of HIV. Almost 85.9% participants said that HIV is a preventable disease. Still 29.7% participants thought that HIV/AIDS is completely curable and there is a treatment option available in alternative medicines like Unani and Ayurveda. This shows that there are considerable misbeliefs regarding HIV/AIDS. Blood test is mandatory the diagnosis of HIV was thought by 86.72% while 17.19% participants said that urine test is necessary for HIV diagnosis.

About 62.11% participants said that person with HIV/AIDS can stay with family. Eating together and hand shaking was approved by 32.8% and 30.5% participants respectively. Only 12.5% participants said that person with HIV can marry. This show that still there is a need to change in attitude of adolescents towards HIV/AIDS positive people.

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**Conflict of Interest:** none

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# An Epidemiological Study of ABO&Rh (D) Blood Group Distribution in Healthy Blood Donors in Western U.P., India

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## ABSTRACT

**Abstract:** This study was conducted to determine the distribution of ABO& Rh Blood groups in western U.P, India as no data is available from this region.

This study will help in planning and establishment of functional blood bank services that would meet the ever-increasing demand for safe blood and blood products.

It was conducted on 6000 blood donors over a period of four years from Jan 2008 to Jan 2012. at the School of Medical sciences & research, Sharda Hospital, Sharda university, Greater Noida.

The donors were both males & females which included both voluntary & replacement donors. The results were analyzed and the data was compiled. Our study which involved 6000 donors, both male and female, showed 'B' blood group type to be the most common, viz., 1964 (32.73%) donors, followed by the 'O' blood group which had 1856 (30.93 %) donors, 'A' blood group 1349 (22.48 %) and 'AB' 429 (7.15 %) donors being the least common which shows that it follows the Asiatic trend of B > O > A > AB.

Rh-D blood group frequency was 93.310% positive and 6.69% negative.

**Keywords:** Blood donors, Antisera

## INTRODUCTION

Blood transfusion is an effective mode of emergency lifesaving treatment.

There are differences in the prevalence of blood groups in different populations and geographical areas. It is wise to know about these blood groups frequencies so that the blood banks can store them accordingly.

Still very few studies are available for ABO blood group distributions, especially in North India.

There are many differences in the prevalence of blood groups in the world which various studies suggest. It is important to know these differences, to be able to cater to the emergency as well as routine blood requirements in that particular population.







ABO was discovered in 1901 and since then a lot of population has been migrated and mixed. Blood requirement is a major problem for the world, especially for India. Even though there is population explosion in India; we still need to import blood. Voluntary blood donors are fewer due to lack of awareness. If we know

the distribution patterns of blood groups in a particular area, then we would also know our requirements in that area. Thus, this study may be helpful to the society.

## MATERIALS & METHOD

The present study was conducted on 6000 healthy blood donors in the School of Medical Sciences & Research, Sharda Hospital, Sharda University, and Greater Noida.

**Table 1: Antigen and antibodies in different blood group**

Blood group	A	B	AB	O
Antigen in RBC	A antigen 	B antigen 	A& B antigen 	Neither A nor B antigen
Antibodies in Plasma	B antibodies 	A antibodies 	Neither A nor B antibodies	Both A and B antibodies 

ABO & Rh grouping was done using commercially available anti sera A, B, AB, H & Rh (D) and known A blood group cells and B blood group cells prepared in house from pooled blood units. Anti - D which is most immunogenic was used for Rh grouping.

Hence, those who showed agglutination with anti-sera D were considered to be Rh positive & those who did not show agglutination with anti-sera D were considered Rh negative.

For determination of blood groups, both forward & reverse grouping was done and results were analyzed and compiled.

**Table 2: Forward blood grouping method**

Blood group	Anti A	Anti B	Anti Rh D
A positive	Agglutination +	Agglutination Negative	Agglutination +
A Negative	Agglutination +	Agglutination Negative	Agglutination Negative
B Positive	Agglutination Negative	Agglutination +	Agglutination +
B Negative	Agglutination Negative	Agglutination +	Agglutination Negative
AB Positive	Agglutination +	Agglutination +	Agglutination +
AB Negative	Agglutination +	Agglutination +	Agglutination Negative
O Positive	Agglutination Negative	Agglutination Negative	Agglutination +
O Negative	Agglutination Negative	Agglutination Negative	Agglutination Negative

**Table 3 - Reverse blood grouping method**

Blood group	A group RBC	B group RBC
A	Agglutination Negative	Agglutination Positive
B	Agglutination Positive	Agglutination Negative
AB	Agglutination Negative	Agglutination Negative
O	Agglutination Positive	Agglutination Positive

Observation /findings - In the present study it was found that blood group B Positive is most prevalent in this area.

B Positive = 32.73 % closely followed by

O Positive = 30.93 %

A Positive = 22.48 %

AB Positive = 07.15 %

There was no donor with Bombay group.

B pos > O pos > A pos > AB pos > B neg > O neg > A neg > ABneg

**Table 4: Distribution of the ABO & Rh blood groups in Greater Noida**

Blood group	Total number	%
A Positive	1349	22.48 %
A Negative	93	1.55 %
B Positive	1964	32.73 %
B Negative	159	2.65 %
O Positive	1856	30.93 %
O Negative	125	2.08 %
AB Positive	429	7.15 %
AB Negative	25	0.41%

**Table 5 - Age wise distribution of donors**

≤ 20 yrs.	523
21 - 30	3482
31 - 40	1604
41 - 50	354
≥ 37	37

6000 donors

**Table 6 - Religion wise percentage of donors**

Hindus	88.57 %
Muslims	7.34 %
Sikhs	3.26 %
Christians	0.81 %

**Table 7- Distribution of blood group as per religion**

	Hindus	Muslims	Sikhs	Christians
A	24.08 %	2.4 %	0.8 %	–
B	31.02 %	0.4 %	1.2 %	0.8 %
AB	7.34 %	0.8 %	-	–
O	26.12 %	3.6 %	1.2 %	–

**Table 8: Distribution of blood donors as per age group**

	≤ 20 yrs.	21 - 30 yrs.	31 - 40 yrs.	41- 50 yrs.	≥ 51 yrs.
A	0.8 %	18.7 %	8.5 %	1.2 %	0.4 %
B	2.8 %	19.18 %	8.5 %	2.04 %	–
AB	0.4 %	4.8 %	2.04 %	1.2 %	–
O	0.8 %	15.51 %	11.2 %	0.8 %	0.8 %

## DISCUSSION

The study shows that majority of donors were of the age group of 21 -30 yrs.

(3482 /6000) and most of them were Hindus - 88.57 % followed by Muslims 7.34 %, Sikhs 3.26% & Christians 0.81%..

Hindu donors were mostly of blood group B while Muslims were mostly of blood group O.

Only a few studies of ABO & Rh have been carried out in India. The only study for the prevalence in North India done by Nanu & Thapliyal,<sup>1</sup> shows blood group B is the most predominant one. This has also been reported in a study conducted in the neighboring country Pakistan<sup>2</sup>, which co-relates with our study findings.

There are few South Indian studies which reveal a different pattern of prevalence.

Studies by Das et al<sup>3</sup> in south India show that blood group O is most prominent followed by group B & A.

Another study from Chittor,<sup>4</sup> Andhra Pradesh also shows that blood group O is more prevalent.

A study from Bangalore, Karnataka by Sunder et al<sup>5</sup> also shows the same prevalence as the above South Indian studies.

This shows the difference within the prominent blood groups in north & south India. In north India prominent prevalent group is B whereas in South India it is O.

## CONCLUSION

As it is evident that there are differences in the prevalence rates of various blood groups and it is well

known that certain diseases too are related to various blood groups with increased frequency. This knowledge also helps to give an idea about the endemicity of the diseases. It is important to know these differences to be able to cater to the emergency as well as routine blood requirements in that particular population.

## ACKNOWLEDGEMENTS

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**Conflict of interest** - No

**Source of funding** – Personnel & for infrastructure – SMS & R, Gr.noida

**Ethical clearance** – Taken

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# Comparative Study of the Therapeutic Efficacy of the Dapsone (alone), Dapsone plus Tacrolimus (topical) and Dapsone plus Triamcinolone (topical) in Oral Lichen Planus

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## ABSTRACT

**Background:** Oral lichen planus (OLP) is a common, chronic inflammatory condition, which frequently present with symptoms of pain and irritation. OLP is difficult to manage. Existing clinical trials have shown that oral Dapsone and topical corticosteroids are often effective in the management of OLP. However, Tacrolimus has recently been shown to be an effective treatment of OLP without any side effects.

**Objective:** The purpose of this study was to compare the efficacy and safety of Dapsone (alone), Dapsone + Tacrolimus (topical) and Dapsone + Triamcinolone (topical) in management of OLP.

**Material and Method:** In this randomized comparative double-blind study, 57 patients with oral lesions consistent clinically and histologically with OLP were recruited. Patients were divided into three groups of 17 and 22 & 18. In group- 1, 17 patients were given oral Dapsone alone. In group 2, 22 patients were given oral Dapsone and topical Tacrolimus (0.1%). while in group 3, 18 patients were given oral Dapsone with topical Triamcinolone acetamide (0.1%).

**Results:** Group 2 in which oral Dapsone and topical Tacrolimus (0.1%) given showed the best results i.e. good response shown by 45.45% patients and excellent response shown by 36.36% patients without any major side effects.

**Conclusions:** The study showed that Dapsone in combination with topical Tacrolimus ointment (0.1%) is safe, well tolerated, and effective therapy for OLP.

**Keywords:** Dapsone, Oral lichen planus, Topical therapy, Tacrolimus ointment, Triamcinolone Acetonide

## INTRODUCTION

Oral lichen planus is a chronic inflammatory, noninfectious muco-cutaneous disease which affects approximately 0.1-4% of general adult population<sup>1, 2</sup>. OLP is mostly found in middle-aged and elderly patients; the female-to-male ratio is nearly 2:1. It affects 44-62.5%<sup>3, 4</sup> patients with skin lesions but may occur without skin lesions elsewhere. Various forms of OLP appear clinically (reticular, papular, plaque-like, atrophic, erosive, and bullous lesions) that can occur separately or simultaneously.

Although the pathogenesis of OLP is still an area of active investigation, it is well documented that OLP represents a cell-mediated immune response with the infiltrating cell population composed of both T4 and T8 lymphocytes.<sup>5</sup> In general, non-erosive lichen planus is asymptomatic. Patients with atrophic and erosive lichen planus, however, often have symptoms of soreness and need proper treatment. The treatment of symptomatic OLP is challenging. Various drugs such as corticosteroids cyclosporine, retinoids, tacrolimus griseofulvin, dapsone and hydroxy-chloroquine have been used alone or in combination orally, parentally or topically.

Potent topical corticosteroids have been increasingly prescribed in the treatment of erosive lichen planus<sup>6</sup> but the long term use of corticosteroids is limited because of their adverse effects. Dapsone has been reported to

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give encouraging results.<sup>7-10</sup> The rationale for its use is that, Lichen Planus is an autoimmune disorder and dapsone inhibits adherence of antibodies to neutrophils which is important in autoimmune skin diseases and secondly it acts as an anti inflammatory agent by inhibiting the release of chemotactic factors from mast cells.<sup>8</sup>

Recently topical tacrolimus was reported effective in the treatment of patients suffering from oral lichen planus in a number of pilot studies<sup>11,12</sup> Tacrolimus belongs to macrolide family. Tacrolimus inhibits the activation and proliferation of T-lymphocytes by inhibiting the phosphates activity of Calcineurin and suppress the inflammatory reaction

### AIMS AND OBJECTIVE

The purpose of present study was

1. To compare the efficacy of Dapsone (alone), Dapsone + Tacrolimus (topical) and Dapsone + Triamcinolone (topical) in oral lichen planus
2. To find out any untoward effect of Dapsone, Tacrolimus and Triamcinolone during treatment phase and follow up period

### MATERIAL AND METHOD

A prospective randomized study was conducted in the Department of Dermatology, Santosh Medical College and Hospital, Ghaziabad from October 2011 to April 2012 on 65 consecutive patients but survey was completed by 57 patients. Diagnosis of OLP was made by clinical examination and confirmed by histological examination. None of the patient had any systemic disease. Pregnant and breast feeding women were also excluded. Any topical medication for treatment of OLP was stopped for 2 weeks and systemic therapy for at least 4 weeks prior to the study. Approval was obtained from the Institutional Ethical Committee.

Before prescribing these drugs patients were investigated and photographs were taken. 57 patients were recruited in three groups randomly-

Group I (17 patients) – were given tab Dapsone 100 mg once daily(alone) Group II (22 patients) — were given tab Dapsone 100 mg once daily + Tacrolimus 0.1% topical ointment with twice daily application

Group III (18 patients) — were given Dapsone 100 mg once daily + Triamcinolone Acetonide 0.1% topical ointment with twice daily application

Patients were instructed to apply the medication on the lesions 4 times a day. Patients were followed up every 15 days for a period of three months. Clinical

interpretation was made by observing reduction of the size of the lesions. Side by side patients were also observed for any untoward effect

In each group the patients were evaluated for

Mild response:— <25% reduction in the size of the lesion  
Good response :— 25—75%

Excellent response:— 75% or more

**TABLE 1. Demography characteristics of patients with oral lichen planus.**

Sl. No.	Demographic characteristics		
1	Sex	Female	50 (87%)
		Male	7(12%)
2	Age	Range	30 - 65 years
		Mean	48 years.
3	Duration of lesion	Range	7 days – 20 years
		Mean	2 years
4	Type of disease	Erosive oral lichen planus	42 (70%)
		Reticular oral lichen planus	18 (30%)

**TABLE 2. Results of treatment after three months.**

Sl. No.	Groups	Mild Response	Good Response	Excellent Response	Side Effects
1.	Group I(17 Pt)	9(52.94%)	5 (29.41%)	3(17.64%)	2(11.76%)
2.	Group Ii(22pt)	4(18.18%)	10(45.45%)	8(36.36%)	1(4.54%)
3.	Group Iii(18pt)	4(22.22%)	9(50.00%)	5(27.77%)	6(33.33%)

### DISCUSSIONS

In this study 57 patients which showed clinical and histopathological features of oral lichen planus were included. Out of 57 patients 50 (87%) were female and 7 (12%) were male . The mean age of patient was 48 years (range 32 – 65 years). The mean duration of lision was 2 years ( range 7 days – 20 years). 42 (70%) were with erosive typelesion and 18 (30%) were having reticular type of lesion ( table 1). The demographic characteristics of the study were found to be similar with other study<sup>13</sup>.

In this study the efficacy of dapsone was compared with topical triamcinolone and with topical tacrolimus in treatment of OLP. Our results indicates that all the drugs are effective in the treatment of erosive lichen planus, which is in line with the findings of other studies.<sup>14-18</sup>The positive aspect of the present study was that the included patients responded well to topical tacrolimus.

Dapsone has a therapeutic effect in several dermatoses and in lichen planus it has been used by several authors.<sup>7,8,9,10</sup> It is used in dermatology for its

anti-inflammatory properties. It may be due to inhibition of myeloperoxidase hydrogen peroxide cytotoxic system. Effect of dapsone in lymphocyte rich dermatoses may be through a similar mechanism proposed for polymorphonuclear- rich infiltrative dermatoses<sup>19</sup>. It may have an anti-inflammatory effect by inhibiting the release of inflammatory or chemotactic factors from mast cells<sup>20</sup> Dapsone is known to produce reduced responsiveness of lymphocytes to Phytohaemagglutinin in vitro and in vivo.<sup>21</sup>

In the present study, in group 1 when dapsone was given alone only 9(52.94 %) showed mild response, 5 (29.41 %) showed good response and 3 (17.64 %) showed excellent response at the end of 3 months. In regard to the side effects only 2 (11.76 %) showed in the form of nausea & headache. On the other hand when dapsone combined with topical tacrolimus in group 2, 4 (18.18 %) showed mild response, however good response increased upto 10 (45.45 %), whereas 8 (36.36 %) showed excellent response which is very good in number. If we look into the side effects of this group none of the patient complained about irritation or burning sensation after the application of topical tacrolimus, however 4.54 % showed side effect on the form of nausea and insomnia, which may be due to intake of dapsone. Tacrolimus, a member of the immunosuppressive macrolide family, suppresses T-cell activation by binding to cytosolic FK-binding proteins, which, in turn, interferes with the calcium calmodulin-dependent phosphatase calcineurin.<sup>22,23</sup> This ultimately results in the inhibition of cytokine gene transcription, including interleukin 2 and TNF- $\alpha$ . In result, this product can inhibit accumulation of inflammatory cells in OLP<sup>24</sup> (Table 2).

While in group 3, when dapsone combined with triamcinolone patients showed improvement in the similar manner as showed in group 2, but the only thing that differ was the side effect that increased from 1 ( 4.54 %) to 6 (33.33 %) in the form of candidiasis, bad taste and dry mouth. The efficacy of triamcinolone ointment is mainly due to local anti-inflammatory properties of suppressing T-cell function<sup>25</sup> but it is also associated with some side effects (Table 2).

### CONCLUSION

Among the three groups considered in the study Dapsone in combination with topical Tacrolimus ointment( 0.1%) is an appropriate treatment for Oral lichen planus in view of the high efficacy and low risk of fungal infections and other side effects.

**Conflicts of interest:** None declared.

**Source of funding:** Nil.

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# A Study on Assessment of Health Status of School Children of Eastern Bhubaneswar

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## ABSTRACT

**Introduction:** One fifth of the population in every country constitutes school children (5-15 yrs). Their nutritional & health status is a sensitive indicator of Community health & nutrition. Under nutrition and morbidities among them is one of the greatest public health problems in developing countries.

**Objective:** To assess the health status of school children of eastern BBSR.

**Methods:** The Study was conducted from August 2009 to June 2010 after getting permission from the school authority. All students present in school during the study period were examined by a team of members consisting of medical students, junior resident & faculties of department of Community Medicine. General examination of each child was carried out in good natural daylight. Weight (in kg, to the nearest 100 gm) and height (to the nearest 0.5 cm) were recorded.

**Results:** Total 1128 students of 3-16 years age were examined. Comparison of mean heights and weights of the children with the median height for age and weight for age as per NCHS standards indicated that in most of the age groups and both sex groups it was less. The prevalence of wasting and stunting in these children was high (Wasting in 22.4% of boys & 23.45 % of girls, stunting in 18.08% of boys & 18.7 % of girls). On general examination the common morbidities detected were dental caries(29.25 %), anaemia(19.5%), refractive error(8.77%), worm infestation(14.53%), URI (9.21%), skin diseases(7.62%) and vitamin A deficiency(7.6%).

**Conclusion:** The health and nutritional standard of school children were found to be low, more so in girls than in boys. The extent of malnutrition in this group was high, with the children in nearly all ages, both boys and girls, being deficient in both weight and height as compared to the NCHS Std.

**Keywords:** Health Status, School Children.

## INTRODUCTION

Children and adolescents comprise a major proportion of Indian population and are important as they are the future of country's development. School children constitute a particular vulnerable group, and untreated disease among them can have detrimental effect on the academic, social and later the functional potential of individuals. Their nutritional & health status is a sensitive indicator of Community health & nutrition. Under nutrition and morbidities among them is one of the greatest public health problems in developing countries.

Health Supervision of school children is very important, because during this period they spend most of the day time in school & there are chances of **spreading** of communicable disease in the school environment. School health services provide an ideal

platform for early detection of the health problems in these children and treat them. The beginning of school health services in India<sup>1</sup> dates back to 1909, when for the first time medical examination of school children was carried out in Baroda city<sup>2,3,4</sup>. Since then, various types of government sponsored school health programme have been launched from time to time.

So, the present study was carried out to assess the health status of school children of eastern BBSR.

**OBJECTIVE:** To assess the health status of school children of eastern BBSR.

**METHOD:** This study was conducted over 10 months (August 2009 to June 2010) among school going children in Bhubaneswar. We selected schools around the Hi Tech Medical College because of logistics and referral convenience, so that the children identified with

severe disease can be referred to Hi -Tech Medical College hospital for detailed evaluation. This was a school health program undertaken by community medicine dept. of the medical college. We included children of 3-16 year age group available in the Schools. Prior written permission from the school authorities were obtained after explaining the purpose and nature of the study. Each school was visited by the research team (consisting of medical students, junior resident & faculties of department of Community Medicine) on the second week of every month. All the students in the above-mentioned age group attending the school on that day were screened.

A group consisting of 24 students of 4<sup>th</sup> semester MBBS were taken to the school for seven days (during their clinical posting duty under community medicine) to make them aware regarding school health services.

The faculties conducted clinical examination for early detection of disease & nutritional deficiency. The minor illness cases were treated during the check up in school premises and cases of major illnesses were referred to Hi-Tech Medical College (near by health institution) for investigation and treatment. A format was filled up collecting information regarding name, age, sex, religion and other relevant details. Information was also collected regarding past illness and present complaint. Age of the child in completed years was

recorded as per child's version and later verified from school register.

General examination of each child was carried out in good natural day light (after getting verbal consent). Physical examinations of all children were carried out, and their weight (in kg, to the nearest 100 gm) and height (to the nearest 0.5 cm) were recorded. Anaemia was diagnosed from clinical signs such as pallor of the conjunctiva /tongue. Visual acuity was recorded by fixing Snellen's chart at 6m distance.

Physical examination from head to toe was done for detection of signs of nutritional deficiency and other morbidities, any deviation from **normal, if found** was recorded. Medical students assisted in recording of height, weight, visual acuity and filling up the form. MBBS students also learnt method of examination during first three days; one faculty guided four to five students. They also conducted physical examination of a few school children **under supervision** of faculties. Data was analyzed using percentage and  $\chi^2$  test.

**RESULTS:** Total 1128 students of 3-16 years age was examined, out of which 625 were males & 503 were females. Table 1 reflects age and sex wise distribution of children, more no. of children were present in 13 -15 years age group both in boys and girls and less no. in the age group 16.

TABLE - 1. Age & Sex wise distribution of Children.

Age in years	Male		Female		Total	
	Number	%	Number	%	Number	%
3	48	7.68	27	5.34	75	6.6
4	36	5.76	32	6.33	68	5.98
5	43	6.88	41	8.11	84	7.39
6	32	5.12	32	6.33	64	5.63
7	54	8.64	25	4.95	79	6.95
8	35	5.6	35	6.93	70	6.16
9	51	8.16	33	6.53	84	7.39
10	58	9.28	27	5.34	85	7.48
11	33	5.28	30	5.94	63	5.54
12	48	7.68	52	10.29	100	8.8
13	85	13.6	80	15.84	165	14.52
14	54	8.64	50	9.9	104	9.15
15	36	5.76	35	6.93	71	6.24
16	12	1.96	4	0.79	16	1.4
Total	625	100	503	100	1128	100

Age and Sex wise mean weight and mean height is represented in Table- 2 and Table 3 respectively. The mean height and weight were compared with recommended NCHS median (50<sup>th</sup> percentile).<sup>5</sup>

**TABLE -2. Distribution of Children as per their mean weight (in Kg) & Comparison with recommended NCHS median weight**

Age in years	Male			Female		
	No	Mean wt in kg	NCHS median wt	No	Mean wt in kg	NCHS median wt
3	48	16.26	14.7	27	13.96	13.9
4	36	16.59	16.7	32	15.99	16
5	43	19.6	18.7	41	19.62	17.7
6	32	21.65	20.7	32	20.3	19.5
7	54	22.32	22.9	25	21.05	21.8
8	35	23.51	25.3	35	20.98	24.8
9	51	25.14	28.1	33	27.16	28.5
10	58	25.79	31.4	27	30.65	32.5
11	33	28.8	35.3	30	28.8	37
12	48	32.21	39.8	52	35.14	41.5
13	85	38.75	45	80	35	46.1
14	54	43.5	50.8	50	41.3	50.3
15	36	43.5	56.7	35	41.8	53.7
16	12	45.6	62.1	4	43	55.9

**TABLE -3. Distribution of Children as per their mean height (in cm) & Comparison with recommended NCHS median height**

Age in years	Male			Female		
	No	Mean ht in cm	NCHS median ht	No	Mean ht in cm	NCHS median ht
3	48	101.3	96.5	27	97.1	95.6
4	36	106.3	102.9	32	108.57	101.6
5	43	111.6	109.9	41	111.8	108.4
6	32	117.16	116.1	32	117.6	114.6
7	54	117.98	121.7	25	120.33	120.6
8	35	116.39	127	35	121.76	126.4
9	51	129.5	132.2	33	129.69	132.2
10	58	131.19	137.5	27	135.41	138.3
11	33	138.5	143.3	30	136.28	144.8
12	48	130.96	149.7	52	141.68	151.5
13	85	148.61	156.5	80	146.23	157.1
14	54	156.6	163.1	50	151.3	160.4
15	36	149.1	169	35	151.3	161.8
16	12	159.9	173.5	4	150.7	162.4

The mean weight is lower than NCHS median weight in age groups 8-16yrs in both the sexes. The same is true for mean height also. On an average the girls weighed more than the boys at ages 9, 10, 11 and 12 whereas at ages 3-8 and 13-16 the boys weighed more than the girls, but these differences were statistically not significant. On an average the girls were found to be taller than the boys at ages 4, 6, 7, 8, 10, 12 and 15, but these differences were also statistically not significant except at age 10 and 12.

Table 4 shows age & sex wise distribution of weight of children less than 3rd percentile weight of NCHS standard.<sup>5</sup>

**TABLE-4. Age & Sex wise distribution of underweight children (weight less than 3rd percentile weight of NCHS standard)**

Age in yrs	Male			Female			Total		
	No examined	Underweight No	Underweight %	No examined	Underweight		No examined	Underweight	
3	48	3	6.5	27	1	3.84	75	4	5.55
4	36	2	5.55	32	6	18.75	68	8	11.75
5	43	1	2.32	41	1	2.43	84	2	2.38
6	32	4	12.5	32	4	12.5	64	8	12.5
7	54	8	14.81	25	1	4	79	9	11.39
8	35	6	17.41	35	8	22.85	70	14	20
9	51	12	23.52	33	9	27.27	84	21	25
10	58	17	29.31	27	5	18.51	85	22	22.88
11	33	6	18.18	30	12	40	63	18	28.57
12	48	21	43.75	52	17	32.09	100	38	38
13	85	29	34.11	80	31	38.75	165	60	36.36
14	54	16	29.62	50	10	20	104	26	25
15	36	10	27.77	35	11	31.42	71	21	29.57
16	12	5	41.66	4	2	50	16	7	43.75
Total	625	140	22.4	503	118	23.45	1128	258	22.87

weight of 22.4% of boys & 23.45 % of girls were less than 3rd percentile weight of NCHS std.

Table 5 shows age & sex wise distribution of height of children less than 3rd percentile height of NCHS standard .

**TABLE-5. Age & Sex wise distribution of stunting (height of less than 3rd percentile height of NCHS standard)**

Age in yrs	Male			Female			Total		
	No examined	Stunting		No examined	stunting		No examined	Stunting	
3	48	2	4.34	27	0	0	75	2	2.77
4	36	0	0	32	1	2.77	68	1	1.47
5	43	1	2.32	41	8	19.51	84	9	10.71
6	32	1	3.12	32	1	3.12	64	2	3.12
7	54	5	9.25	25	2	8	79	7	8.86
8	35	5	14.28	35	3	8.57	70	8	11.42
9	51	9	17.64	33	1	3.03	84	10	11.9
10	58	13	22.41	27	3	11.11	85	16	18.82
11	33	3	9.09	30	6	20	63	9	14.28
12	48	1	37.5	52	14	26.92	100	32	32
13	85	22	25.88	80	33	41.25	165	55	33.33
14	54	17	31.48	50	10	20	104	27	25.96
15	36	11	30.55	35	11	31.42	71	22	30.98
16	12	6	50	4	1	25	16	7	43.75
Total	625	113	18.08	503	94	18.7	1128	207	18.35

Height of 18.08 % of boys & 18.7% of girls were less than 3rd percentile of NCHS Std. The 11-16 years old children, the age group in which the growth spurt takes place ,were observed to be at highest risk of malnutrition in both the sexes. Weight of 7.35% of boys and 4.7% of girls were found to be more than 97 percentile. (more in 3-9yrs age group in males and 3-6yrs age group in females.)



Table 6 reflects the morbidity profile of school students.

**TABLE-6 Distribution as per Morbidity Pattern of children**

Morbidity	Boys		Girls		Total	
	Number	%	Number	%	Number	%
Wax in ear	242	38.72	157	31.08	399	35.37
Discharge from ear	8	1.28	9	1.78	17	1.5
Caries tooth	181	28.96	149	29.5	330	29.25
Anaemia	90	14.4	130	25.7	220	19.5
Refractive error	50	8	49	9.7	99	8.77
Night blindness	12	1.96	10	1.95	22	1.95
Xerosis	34	5.44	15	2.97	49	4.34
Bitot's spot	8	1.8	7	1.38	15	1.32
Other vit deficiency	51	8.16	26	5.14	77	6.82
Louse infestation	5	0.8	22	4.35	27	2.39
Thyroid enlargement	3	0.5	8	1.58	11	0.97
Skin diseases	52	8.32	34	6.73	86	7.62
URI	50	8	54	10.69	104	9.21
Worm infestation	100	16	64	12.67	164	14.53
Asthma	2	0.32	1	0.18	3	0.26
APD	6	0.96	5	0.95	11	0.97
Trachoma	0	0	2	0.39	2	0.17
Epistaxis	1	0	0	0	1	0.08
Conjunctivitis	1	0.16	1	0.19	2	0.16
Neurofibroma	0	0	1	0.19	1	0.08

On general examination the common morbidities detected were dental caries(29.25%), anaemia(19.5%), refractive error(8.77%), worm infestation(14.53%), URI (9.21%), skin diseases(7.62%) and vitamin A deficiency(7.6%).

**DISCUSSION :** 18.35 % and 22.87% of children had height, weight, less than 3% percentile height of NCHS Std respectively. Children of 11 to 16 years were the most affected. Both boys & girls suffered almost equally which is similar to findings of another study by Shakya SR, Bhandary S, Pokharel PK<sup>6</sup>

On general examination the proportion of students with Vitamin A deficiency and other vitamin deficiency, skin diseases and worm infestation were found to be high in males and anaemia, thyroid enlargement, louse infestation, URI, refractive error were high in females.

Dental caries is the major morbidity (29.25%) in this study, found more among girls than boys but this difference was statistically insignificant ( $\chi^2 = 0.043$ ,  $P > (0.05)$ ). Prevalence of anemia was more among girls than boys and this difference was significant statistically ( $\chi^2 = 23$ ,  $P < 0.05$ ).

The present study shows refractive error among 8.77% school children. Prevalence of Refractive error was more among girls than boys but the difference was found to be statistically insignificant ( $\chi^2 = 1.05$ ). This prevalence is comparable to the reports from Gujarat<sup>7</sup> and Delhi<sup>8</sup>. In the present global scenario, 10 millions

suffering from low vision (VA < 6/18) with correctable Refractive error in the world<sup>9</sup>. As per a study by Jena D, Jena P, Dora J, Patraik J.J, Sahu T<sup>10</sup>, the prevalence of Vit-A deficiency was 7.1% which was almost same as (7.6%) in the present study.

**CONCLUSION:** The health and nutritional standard of school children were found to be low, more so in girls than in boys. The extent of malnutrition in this group was high, with the children in nearly all ages, both boys and girls, being deficient in both weight and height as compared to the NCHS Std. (more in 11-16 yrs age group.) The prevalence of anemia was high in girls. Malnutrition & anemia make the children more susceptible to infection. The study reveals the poor health status of school children in a highly developed and economically well part of Bhubaneswar, highlighting the need for increased attention/focus towards improvement of their nutrition. Caries tooth, anaemia and refractive errors, skin diseases and worm infestation were the common morbidities detected in this study. The data supports assumption that screening of disease in school age could be useful as an effective means for early detection and treatment of morbidities and preventing its long term consequences.

**Conflict of interest**-nil

**Source of support**-nil

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# Effect of Exercise on Various Blood Pressure Parameters in different Groups of Body Mass Index among Young Medical Students

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## ABSTRACT

Developing countries are highly faced with the burden of cardiovascular diseases which places an excessive financial burden on population and health systems. Our study intends to generate relevant information that helps to understand the effect of exercise on blood pressure (BP) among young population of different body mass index (BMI). Such information helps us to prevent and control factors which are associated with abnormal BMI. This preliminary cross sectional study was conducted in the human laboratory of department of physiology, J. N. Medical College, Aligarh. The present study consist of total 50 medical student with 36 males (72%) and 14 females (28%) between the age group of 17-23 years, admitted in the first year in M.B.B.S. Body Mass Index (BMI) was calculated by widespread using Quetlet's Index, which is body weight (in kg) divided by height (in meter<sup>2</sup>). On the basis of BMI, all students were divided into three groups, underweight, normal, overweight. Three reading of their average value was recorded. Pulse pressure is calculated by deducting the diastolic BP from systolic BP. The MP (Mean pressure) was calculated by adding pulse pressure (PP) with one third of diastolic pressure. All students were undergoing exercise by 3 minute steps test. Further three reading of blood pressure were taken and their average value was recorded. The BP parameters of all students (male and females individually) among three group of BMI were compared before and after the exercise. The statistical software SPSS (version 16) was use for data analysis. We used paired student t-test between the individual groups. In our study we found that change in BP parameters after exercise were more significant in students of having normal BMI than under or overweight students. Among all BP parameters, systolic blood pressure (SBP), pulse pressure (PP) was much affected after exercise. Mean pressure (MP) was entirely unaffected by exercise. In this study females were comparatively less affected than males. Overall we found that as exercise was done, SBP and PP was prominently affected and this significant change in BP was found in normal BMI group whereas the findings were not significant in underweight and overweight students. The mechanism of this observation will be discussed.

**Keywords:** Blood Pressure, Body Mass Index, Exercise.

## INTRODUCTION

Body Mass Index (BMI) is one of the factors related to high blood pressure. Aside from the waistline, BMI is one of the key measures to determine whether a person has underweight, normal weight or overweight or obese. It is the computation of the weight in relation to the height of a person. There are also 4 categories of BMI<sup>1, 2</sup>.

1. Underweight (BMI is below 18.5)
2. Normal weight – (BMI is 18.5 – 24.9)
3. Overweight – (BMI is 25 – 29.9)
4. Obese – (BMI is 30 of higher)

Adolescent and young adult obesity is now a significant public health concern because of its immediate impact on their physical and psychological health such as loss of confidence and self esteem often leading to isolation and depression. More importantly, it is a risk factor for the development of chronic diseases later in life (Dietz, 1998)<sup>3</sup>. Indeed, the prevalence of obesity increased in all ages, genders and ethnic or racial groups during the past three decades. The number of factors responsible for this condition ranges from genetic factors (Rosenbaum and Liebel 1998)<sup>4</sup>,

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environmental factors such as increased calorie intake and decreased physical activity (Birch and Fisher, 1998)<sup>5</sup>, psychological disorders (Barlow and Dietz, 1998)<sup>6</sup>. Obese young adults do less physical activities, prefer sedentary lifestyles and are less tolerant to physical exercises. These attitudes ultimately increase their predisposition to hypertension and other cardiovascular diseases later in life due to continuous deposition of fatty adipose tissue and “quickened” atherosclerotic changes in different blood vessels in their body (Hirsch et al 1976)<sup>7</sup>. Blood pressure is associated with physical fitness and BMI. Fitness and BMI were independently associated to BP. One study suggested that BMI was a stronger predictor of hypertension in those with a low fitness level, especially in girls<sup>8</sup>. Our objective of study was to determine the changes in blood pressure parameters with different grades of BMI in young medical students before and after the exercise. Since this study include the young student to evaluate the prevalence of blood pressure variation in the younger age group so that we could prevent any change in blood pressure parameters before the development of any disease i.e., primordial prevention.

### MATERIAL & METHOD

This preliminary cross sectional study was conducted in the human laboratory of department of Physiology, J. N. Medical College, Aligarh. Participants were 50 medical students (male, female) between the age group of 17-23 years. All were non-smokers, belonging to middle and higher socioeconomic group admitted in the first year in M.B.B.S course. Their height, weight, age, sex, smoking habits, BMI and systolic & diastolic blood pressure were recorded. Body Mass Index (BMI) was calculated by widespread using Quetlet's Index, which is body weight (in kg) divided by height (in meter<sup>2</sup>). On the basis of BMI, all students were divided into three groups that is under weight whose BMI<sup>6,7</sup> was less than 18.5kg/m<sup>2</sup>, normal whose BMI was between 18.5 and 24.9kg/m<sup>2</sup> and overweight

whose BMI was more than 25 kg/m<sup>2</sup>. Body weight was measured with shoes off and wearing the least possible clothes (to the nearest 0.5kg) with subject standing on the digital weighing scale. Height was measured in cm (to the nearest 0.5 cm) with the subject standing in an erect position without shoes against a vertical scale attached on the wall. Students were advised not to smoke, drink alcohol or take vigorous activity preceding the BP measurement. Students were rested for 10 min before their blood pressure was taken. Three readings were taken at 3min intervals in sitting condition, on the left arm by using a standard mercury sphygmomanometer and their average value was recorded. Systolic blood pressure (SBP) and Diastolic blood pressure (DBP) were defined as the points of the appearance and disappearance of Korotkoff sounds, respectively. Pulse pressure was calculated by deducting the diastolic BP from systolic BP. The MP (Mean pressure) was calculated by adding pulse pressure with one third of diastolic pressure. All students were undergoing exercise by 3 minute step test. Further three reading of blood pressure were taken and their average values were recorded. The examinations also include the questions regarding smoking history, physical activity, and diet history and alcohol consumption. Medical students who had major disorder (cardiac, respiratory, renal or hematological disorder) and those taking antihypertensive medications or cholesterol lowering medications were not consider in the study. The statistical software SPSS (version 16) was use for data analysis. The Mean values of Weight, Height, BMI, SBP, DBP, PP, and MP was determined. The BP parameters of all students (male and female) among three groups of BMI were compared before and after the exercise (Paired t- test). The P value < 0.05 was taken as significant.

### OBSERVATION & RESULTS

A total of 50 Young population of medical student with 36 males (72%) and 14 females (28%) participated in the study.

Table-1 shows that maximum subjects are of normal body mass index (63.89% of males, 71.22% of females).

**Table No. 1. Distribution of Subjects according to the different grades of body mass index.**

S. No.	Characteristics	Cut-off values	Grade	Male (n=36) No. (%)	Female (n=14) No. (%)
I	BMI	<18.5	Underweight	6(16.67)	2 (14.29)
		18.5 - <24.9	Normal	23(63.89)	10(71.42)
		>25.0	Overweight	7(19.44)	2 (14.29)

Table-2 showed the distribution of subjects according to the different grades of blood pressures, before and after the exercise.

**Table No.2. Distribution of subjects according to the different grades of blood pressures, before and after the exercise**

S.N.	Characteristics	Cut- off values	Male (n=36)		Female (n=14)	
			Before Exercise	After Exercise	Before Exercise	After Exercise
1.	SBP	<140	27(75.0)	9(25.0)	12(85.72)	6(42.86)
		e"140	9(25.0)	27(75.0)	2(14.28)	8(57.14)
2.	DBP	<90	29(80.56)	32(88.89)	13(92.86)	14(100)
		e"90	7(19.44)	4(11.11)	1(7.14)	0(0)
3.	PP	d"40	11(30.56)	0(0)	3(21.43)	0(0)
		>40	25(69.44)	36(100)	11(78.57)	14(100)
4.	MP	d"100	23(63.89)	24(66.67)	11(78.57)	12(85.71)
		>100	13(36.11)	12(33.33)	3(21.43)	2(14.29)

Table-3 and Table-4 showed that mean value of all BP parameters like SBP, PP, MP except DBP were increased after exercise in each group of body mass index of both males and females.

**Table No. 3. Mean values of different parameters observed in male subjects before and after exercise**

S.No.	Parameters	Underweight(n=6)		Normal(n=23)		Overweight(n=7)	
		Before Exercise	After Exercise	Before Exercise	After Exercise	Before Exercise	After Exercise
1.	SBP	128±19.41	146±20.16	130.52±9.75	145.65±10.17	135.71±19.64	156.57±17.58
2.	DBP	69.33±14.95	72.33±9.67	84.35±7.55	73.56±10.34	83.43±9.36	75.71±10.55
3.	PP	57.0±34.75	73.67±24.38	46.17±8.44	72.09±14.39	52.28±16.22	80.86±21.47
4.	MP	87.75±4.79	96.86±8.08	99.69±7.34	98.42±8.15	102.26±9.35	104.07±2.70

**Table No. 4. Mean values of different parameters observed in female subjects before and after exercise**

S.No.	Parameters	Underweight(n=6)		Normal(n=23)		Overweight(n=7)	
		Before Exercise	After Exercise	Before Exercise	After Exercise	Before Exercise	After Exercise
1.	SBP	136.0±8.49	151±1.41	119.0±9.30	140.60±10.92	130.0±2.83	135.0±7.07
2.	DBP	86.0±5.66	69.0±18.38	73.4±7.37	65.4±7.72	78.0±2.83	75.0±7.07
3.	PP	50.0±2.87	82.0±16.97	45.6±5.15	75.20±12.73	52.0±0.00	60.0±0.00
4.	MP	102.85±6.57	96.30±12.73	90.56±7.21	90.43±6.60	95.3±2.83	95.0±7.07

Table-5 showed the comparative significance of change of blood pressure in different group of males and females, before and after exercise which describes that SBP and PP were increased significantly after exercise in males of all the three BMI groups and in females of only normal BMI group. Also there is only DBP was decreased significantly in normal BMI group of both sexes.

**Table No. 5. Comparative significance of change of blood pressure in different group of Males and Females, before and after exercise**

S.No.	Parameters	Underweight		Normal		Overweight	
		Males	Females	Males	Females	Males	Females
1.	SBP	0.004*	0.205	0.00*	0.002*	0.008*	0.344
2.	DBP	0.617	0.310	0.00*	0.004*	0.228	0.500
3.	PP	0.021*	0.263	0.00*	0.00*	0.001*	-
4.	MP	0.097	0.382	0.559	0.952	0.736	0.937

Our study showed that Change in BP parameters after exercise were more significant in students of having normal BMI than under or overweight students. Among all BP parameters, Systolic blood pressure (SBP), Pulse pressures (PP) were significantly increased after exercise among each group of BMI in both sexes. Diastolic blood pressure (DBP) significantly decreased after exercise in students of normal BMI in both sexes. No significant change was observed in Mean pressure. Males have higher BP values than females. Females were comparatively less affected than males.

## DISCUSSION

There are several studies which have been conducted over normal BMI person but we perform a preliminary work to observe the effect of exercise on various blood pressure parameters in different groups of body mass index among young medical students. The exercise performed by the medical students was 3 minute step test which is dynamic or rhythmic exercise in which resistance to blood flow increases because of increased heart rate and stroke volume. At the same time, total peripheral resistance decreases when the arterioles serving working muscles dilate which increases blood flow to the working muscles. Further, the greater the muscle mass being used during exercise, the greater the reduction in peripheral resistance. Thus, during rhythmic exercises there is less increase in BP involving the legs than with the arms due to greater vasodilatation in the larger leg muscles. Besides this systolic pressure is higher because of elevated stroke volume and diastolic pressure is lower because the fall in systemic vascular resistance allows greater runoff from the aorta during diastole. This is explanation of physiology of changes in blood pressure in normal BMI person.

The type of exercise performed by the students was isotonic. Comparative significance of change of blood pressure in different group of males and females before and after exercise describes that SBP and PP were increased significantly after exercise in males of all the three BMI groups and in females of only normal BMI group. All changes in blood pressure parameters were found to be normal physiological changes in males which should be occur after the exercise but females of underweight or overweight did not show consistent results. Also there is only DBP was decreased significantly in normal BMI group of both sexes but it was not seen significant changes in underweight or overweight males and females. This observation was probably because of impaired vascular smooth muscle vasodilatation which depends on local metabolic factors and neuronal reflex regulation affecting

condition of vessel wall. This suggested mechanism is supported by the study of Sally E. Brett, BN; James M. Ritter; Philip J. Chowienczyk, where they described that diastolic blood pressure is determined mainly by cardiac output and peripheral vascular resistance<sup>9</sup>. During exercise, cardiac output increases and peripheral vascular resistance decreases in response to vasodilation of resistance vessels within exercising skeletal muscle<sup>8</sup>. Thus it might be possible these non significant changes in diastolic blood pressure during exercise in underweight and overweight medical students could therefore be result from an inappropriately high cardiac output or impaired vasodilation of resistance vessels within skeletal musculature.

Our study selected the medical students of young age. They were divided into three categories of BMI so in these younger age, though student were limited in numbers, showed some significant results. The changes in blood pressure parameters were not fully understood in underweight and overweight students but this has been clear that if some prequations would not be consider it would lead further more significant changes, thus some primordial prevention should be taken to prevent abnormal BMI, not only high BMI but also low BMI and its consequences later in life. Aerobic exercise reduces blood pressure in both hypertensive and normotensive persons. An increase in aerobic physical activity should be considered an important component of lifestyle modification for prevention and treatment of high blood pressure<sup>10</sup>.

## CONCLUSIONS

- Our preliminary study findings indicate mild changes in blood pressure parameters among different groups of body mass index in young medical students after exercise.
- These observations require the urgent need for public health measures early in life to prevent abnormal BMI and its consequences later in life (Primordial Prevention).
- By regulating energy intake and normal physical activity, reduces BP in adolescents which protect them from cardiovascular diseases and its complications.
- Relationship among BP, physical fitness, and fatness would be useful in order to qualify recommendations of lifestyle for improved health in adolescents.

**Conflict of Interest** None

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# Failure of Eruption of Permanent First Molar-A Case Report

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## ABSTRACT

Failure of permanent teeth to erupt without any known cause is a rare incident. We report a case of unerupted permanent teeth and make an effort to predict all possible causes of non-eruption of permanent teeth clinically and radiographically. It is essential to diagnose and treat eruption disturbances as early as possible because treatment at a later stage is usually more complicated due to the tendency of malocclusion to increase with time and reduced ability of remaining dentition to adjust.

**Keywords:** Tooth Germ, Follicle, Eruption, Impaction, Primary Retention, Secondary Retention, Malocclusion, Alveolar Osteotomy.

## INTRODUCTION

Eruption is a process of biological maturation, which comprises the axial movement of a tooth from the developmental position within the jaw towards the functional position in the occlusal plane. The eruption of the first and second permanent molars is especially important for the co-ordination of facial growth, and for providing sufficient occlusal support for undisturbed mastication. The eruption of some molars may be delayed, and sometimes may not occur at all. This failure of eruption is associated with a range of medical conditions<sup>1</sup>. Nevertheless, on occasion the failure of eruption of first and second permanent molars is not associated with any systemic conditions or genetic alterations<sup>2</sup>. Failure of eruption of first and second permanent molars is rare<sup>3</sup>; the prevalence in the normal population is 0.01% in the case of the first permanent molar, and 0.06% in the case of the second<sup>4</sup>. Failure of eruption may occur due to an impaction, primary retention, or secondary retention. Failure of permanent teeth to erupt without any known cause is a rare incident. It is essential to diagnose and treat eruption disturbances as early as possible because treatment at a later stage is usually more complicated due to the tendency of malocclusion to increase with time and

reduced ability of remaining dentition to adjust. We report a case of unerupted mandibular first permanent molar.

## CASE REPORT

An 11-year-old girl who was in excellent general health reported for a routine dental check up. She had problems in chewing. Her past medical history was unremarkable. On examination the maxillary arch and mandibular arch were normal in width with edentulous space in the right posterior side of mandibular arch (Figure 1 & 2). The patient maintained an excellent oral hygiene. After thorough oral examination, the patient was made aware of the clinical absence of permanent first molar teeth in the lower right side of the arch, and was asked specific questions related to the problem.

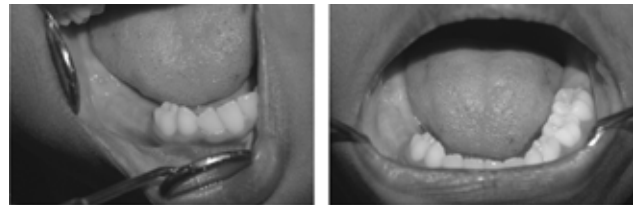


Fig 1 & 2. Showing edentulous space in the right posterior side of mandibular arch

None of the family members had impacted teeth other than third molars. Her birth was normal with no history of radiation or unusual drug therapy during gestation. No history of trauma or previous infection to affected area was specified. Radiographic examination confirmed the presence of unerupted permanent teeth in the lower jaw (Figure 3). As the patient had functional problems and wishes to have treatment, treatment

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planning according to the chart was instituted and follow up continues.

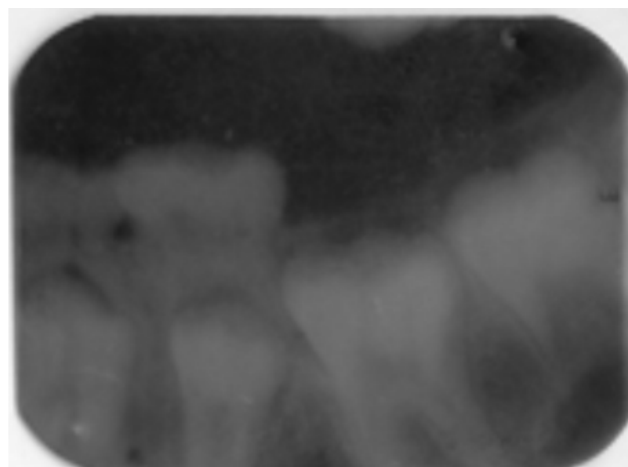


Fig 3. IOPA showing unerupted mandibular permanent first molar

Based on clinical & radiographic examination present case can be considered as unerupted permanent molar due to primary retention (degree 3). The degree of non eruption was measured radiographically in millimeters of bone, from the alveolar ridge to the central fossa of the unerupted molar (Table 1)<sup>5</sup>.

Table 1. Characteristics of the unerupted molar

**Stage of root formation**

- A Crown completed, no root formation
- B One third of root completed
- C Two thirds of root completed
- D Root almost completed, open apex
- E Apical end of root completed

**Degree of non eruption**

- 0 0-2 mm or covered by gingiva
- 1 2-4 mm
- 2 4-6 mm
- 3 6-8 mm
- 4 8-10 mm
- 5 More than 10 mm

As the patient had functional problem (difficulty in mastication) treatment was instituted. Treatment included surgical removal of overlying alveolar bone (alveolar osteotomy<sup>6</sup>). No pathology was detected associated with the unerupted tooth during surgical procedure. Post surgical and oral hygiene instruction were given. Patient was reviewed after 3 months with

an IOPA & OPG of the same area. Radiographic findings of the unerupted first molar showed positive signs of eruption, as it was in line with second molar (evident in figure 4 & 5) but was not clinically erupted in the oral cavity. Patient was further scheduled for recall visits.

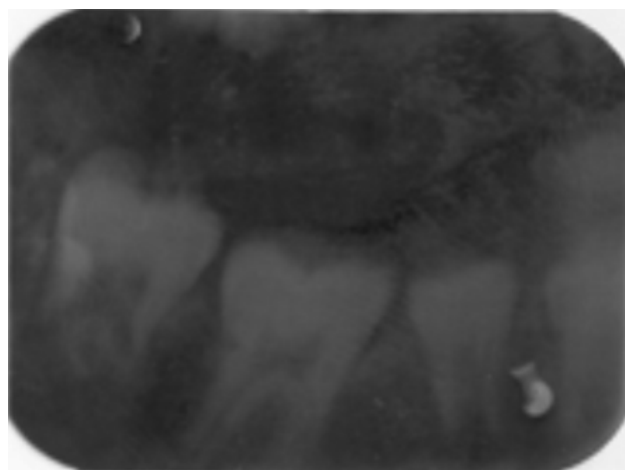


Fig 4. Recall visit IOPA (after 3 months)



Fig 5. Recall visit OPG (after 3 months)

**DISCUSSION**

Each patient has an individual eruption schedule and path. The successful development of the entire permanent dentition involves, apart from the eruption process, the harmonious forward and lateral growth of both the maxilla and mandible. In literature impaction and retention are often used synonymously. These are actually separate entities with different etiology as well as treatment approaches<sup>7</sup>. From an etiological point of view three main causes of eruption disturbances can be distinguished: ectopic position of the tooth germ, obstacles in the eruption path and failure in the eruption mechanics (i.e. follicle or periodontal ligament defects according to the stage of eruption)<sup>8,6</sup>. The first two conditions lead to impaction and the last to primary or secondary retention. Primary retention (unerupted and embedded teeth) is defined as a cessation of eruption before gingival emergence without a recognizable physical barrier in the eruption path or ectopic eruption<sup>9,8,6</sup>. Secondary retention is termed as cessation of eruption after emergence, without evidence

of a physical barrier either in the eruption path or as a result of an abnormal position<sup>10,9,8,6</sup>. Other terms used in literature are submergence, half retention, re-impaction, re-inclusion and ankylosis<sup>11,10,8,7</sup>. Eruption disturbances of permanent I and II molars are relatively rare, but they have considerable clinical impact when they occur, therefore they are important for normal development of dentition and coordination of facial growth and occlusal support of undisturbed mastication<sup>7</sup>. Usually the patient easily notices non-eruption of anterior teeth because the primary tooth is not replaced by its corresponding permanent tooth, a fact that causes the patient to seek dental help for aesthetic reasons<sup>9</sup>. Conversely clinical absence of posterior teeth is generally discovered during a dental examination. This implies a late diagnosis of the abnormality and a poor prognosis. In order to prevent this situation, a radiographic examination (ideally during the early mixed dentition period) for early diagnosis of eruption disturbances of permanent teeth is recommended, particularly when considering that these abnormalities are associated with high rate of occlusal disturbances that require orthodontic correction<sup>9</sup>.

The diagnosis of primary retention should be based on clinical observation, that is, when eruption of permanent tooth is at least 2 years behind schedule. This should be combined with a radiographic demonstration of lack of eruptive movements over a period of 6 months<sup>12,8,7</sup>. Furthermore, all teeth distal to the affected tooth also fail to erupt as in the present case<sup>13,6</sup>. These teeth are not visible in the oral cavity. Primary retention is probably caused by a disturbance in dental follicle that fails to initiate the metabolic events responsible for bone resorption in the eruption trajectory<sup>7,9</sup>.

Unfortunately, the low prevalence of impaction of the first and second molars and the difficulty in distinguishing between primary and secondary retention and impaction has been major factors underlying the lack of uniformity in the management of these eruption disturbances<sup>9</sup>. A differential diagnosis for an impacted tooth is not possible without clinical and radiographic assessment; however an ankylosed tooth or a tooth with failure of its eruption mechanism may be mistaken for an impacted tooth. So a complete

understanding of impaction, primary retention and secondary retention is considered necessary.

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# A Ten year Study of Pattern of Electrocution Deaths in Bangalore

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## ABSTRACT

Deaths due to electrocution constitute an important part of unnatural deaths even though uncommon but most of them are preventable since almost all are accidental deaths. This 10 year study from January 2000- December 2009 at department of Forensic Medicine, M.S. Ramaiah Medical College revealed that a total of 76 cases of electrocution were identified in 10 years averaging 7.6 cases per year and constituting 1.05% of autopsies conducted. The highest incidence was seen in 20-29 yrs age group (44.7%). Males constituted 83% of cases. Construction workers accounted for 32.9% of cases and 28% of individuals were engaged in domestic activities. Maximum number of cases occurred in the afternoon (63.2%). In 32 cases there was a single electric contact wound and the most common site was the hand (49cases). Exit wounds were noted in 10 cases (13.2%) and foot was the commonest site (8cases). In eleven (14.5%) cases the deceased had sustained other associated fatal injuries.

**Keywords:** *Electrocution, Contact Mark, Exit Wound.*

## INTRODUCTION

The human body is a good conductor of electricity because it contains a large amount of water and dissolved salts in the form of blood and other body fluids. This means that an electric current may pass easily through the body, a process known as electrocution, causing various types of tissue damage and even death. The electricity takes the fastest route through the body which is, typically, from one hand to another or from a hand down to the ground<sup>1</sup>. Electricity related deaths result from an overwhelming transmission of electrical current to the body<sup>2</sup>. At autopsy, the points of entry and exit of the current may be marked by a burn or a collapsed blister, the latter with a characteristic brown center and pale rim. The hand is the most common entry point for electrocution. One of the reasons that electrocutions can be challenging deaths to identify is that in about one-half of low voltage electrocutions, there are no electrical burns or other autopsy findings to suggest electrocution<sup>3</sup>. The pathologist's interpretation may therefore rely much more on the circumstances of the

incident rather than on the autopsy findings. The usual mode of death is cardiac arrhythmia leading to ventricular fibrillation and arrest<sup>4</sup>. Deaths caused by electrocution are infrequent, virtually all are accidents with suicides rare and homicides even rarer<sup>5</sup>. Hence most of the deaths could be prevented if proper precautions are taken both at home and workplace. In view of widespread use of electricity for commercial, industrial, public and domestic purposes this study was undertaken to know the age and sex incidence, occupation, presence and sites of contact and exit marks and the other associated fatal injuries.

## MATERIAL AND METHOD

This 10 years study was taken up in Department of Forensic Medicine M.S. Ramaiah Medical College. Data was collected from all electrocution deaths amongst autopsies conducted at M.S. Ramaiah Medical College from January 2000– December 2009, Bangalore and information / history was obtained from police / relatives of deceased regarding the circumstances. In few cases scene of occurrence was visited.

## RESULTS

Table 1. Year wise distribution of cases

Sl no	Year	Total no of autopsies	Deaths due to electrocution	Percentage %
1	2000	600	6	1
2	2001	635	5	0.7
3	2002	632	11	1.74
4	2003	635	5	0.78
5	2004	695	8	1.15
6	2005	738	7	0.94
7	2006	791	9	1.13
8	2007	811	8	0.98
9	2008	896	8	0.89
10	2009	819	9	0.98
		7252	76	1.05

Table 2. Age and sex of distribution

SL No	Age	Male	Female	Total	Percentage
1	0-9 yrs	0	0	0	0
2	10-19 yrs	5	1	6	7.9
3	20-29 yrs	29	5	34	44.7
4	30-39 yrs	11	1	12	15.8
5	40-49 yrs	14	3	17	22.4
6	50-59 yrs	2	2	4	5.3
7	> 60 yrs	2	1	3	3.9
		63	13	76	100

Table 3. Activity at the time of electrocution

Sl no.	Activity	No of cases	percentage
1	Domestic	28	36.9
2	Factory work (Non electric)	3	3.9
3	Electrical work	14	18.4
4	Construction work	25	32.9
5	Others	6	7.9
	Total	76	100

Table 4. Time of occurrence

Sl no	Time	No of cases	Percentage
1	Morning(6 am to 12 noon)	27	35.5
2	Afternoon(12 noon to 6 pm)	48	63.2
3	Evening(6pm to 12 midnight)	1	1.3
4	Late night(12 midnight to 6 am)	0	0
		76	100

Table 5. Presence and number of electric contact marks

Sl no	Electric contact mark	Total	No of electric contact marks	Site of electric contact mark
1	Present	72	1 in 32 cases 2 in 24 cases 3 or more in 16 cases	Hand-49 Forearm-9 Arm-3 Leg-5 Face-3 Others-3
2	Absent	4		
	total	76		

**Table 6. Exit wounds – presence and location**

Sl no.	Exit wound	No of cases	Site of exit wound
1	Present	10	Hand-02 Foot-08
2	Absent	66	
	Total	76	

## DISCUSSION

A total of 76 cases of electrocution were identified in the 10 years period from Jan 2000 to Dec 2009, averaging 7.6 cases per year and accounted for 1.05% of total autopsies conducted. In a similar study conducted in South Australia 3.2 deaths on an average occurred per year<sup>6</sup> and in another study in Bulgaria deaths due to electrocution accounted 1.46 per year<sup>7</sup>. The higher incidence of electrical deaths in this part of the country especially in Bangalore could be attributed to the rapid growth and industrialization of the city hence people engaged in constructional activities and working in industries getting electrocuted accidentally.

Barring a case of suicide all cases (98.7%) were due to accidental electrocution, which is in contrast to a study conducted in South Australia where 29% of cases were due to suicides and 2% were due to homicides and accidents constituted 69% of cases<sup>6</sup>.

The higher incidence in 20-29 yrs age group is because of their active involvement in domestic, out door activities, occupation, exposing them for greater risk of electrocution.

Males constituted 83% of cases as in India they are generally working outdoor and few of them being electricians by profession and few handling the electrical appliances, hence facing the high risk of accidental electrocution. But females remain in door and hence most of them sustained electrocution accidentally while handling switches and electrical appliances. The lower incidence in extremes of age can be attributed to their sedentary life style.

Similar observation was made in a study conducted in Bulgaria where males constituted 85.7% and females 14.29% of cases<sup>7</sup>. In another study conducted in South Australia male's constituted 91% and females 9% of cases<sup>6</sup>.

From the study it can be inferred that 28% of individuals were engaged in domestic activities like using household electric appliances (switches, wires), gardening etc who got accidentally electrocuted due to lack of safety measures taken while installing electrical equipment improper wiring leading to short circuits. Construction workers accounted for 32.9% of cases constituted by laborers, masons, tile polishers, plumbers

died because of accidental electrocution due to lack of awareness about the electric points, short circuits, unawareness about the power supply at that point of time. Electricians constituted the 18.4% of cases who while engaged in repair, installation work died due to accidental electrocution. Others in the study include the individuals engaged in activities like walking in public places etc. In two cases the individuals got electrocuted since they were carrying long rods which touched accidentally the overhead high tension wire on roadside.

Maximum number of cases occurred in the afternoon (63.2%) and morning as most of the people are actively into their profession (domestic and non domestic) during this time hence are at risk.

In 32 cases there was a single entry wound in the form of raised blisters, hard brownish raised nodule, deep scorching or a patterned contact mark. The most common site was the hand (49cases). In 4 cases where there was no obvious electric contact mark cause of death was opined as due to electrocution based on internal post mortem findings (petechiae over heart) and HPE findings<sup>8</sup> (stretching of myocardial fibers along with elongation and wavy appearance of fibers at places and section of kidneys showing congested vessels and foci of hemorrhage) and circumstantial evidence.

Exit marks are variable in appearance; usually appear as splits in the skin or annular raised grey white rings with umbilicated centre at the site of current passage. But sometimes it can cause more damage to tissues. In our study exit wounds in the form of peeling and blistering of skin, burns were noted in 10 cases (13.2%) and foot was the commonest site of exit wound.

In eleven (14.5%) cases the deceased had sustained other fatal injuries in the form of fractures, head injury etc due to associated fall after electrocution and died.

## CONCLUSION

A total of 76 cases of electrocution were identified in the 10 years averaging 7.6 cases per year and constituting 1.05% of autopsies conducted. The highest incidence was seen in 20-29 yrs age group (44.7%). Males constituted 83% of cases. Construction workers accounted for 32.9% of cases and 28% of individuals were engaged in domestic activities. Maximum number of cases occurred in the afternoon (63.2%) and morning (35.5%). In 32 cases there was a single entry wound and the most common site was the hand (49cases). Exit wounds were noted in 10 cases (13.2%) and foot was the commonest site (8 cases). In eleven (14.5%) cases the deceased had sustained other associated fatal injuries.

## RECOMMENDATIONS

### 1. Safety at Home

- a. Electrical equipments or switches should not be operated with wet hands.
- b. Ensure electrical appliances at home are in proper working condition with effective non-leaking connections.
- c. Every electrical installation should be earthed properly.
- d. All electrical wiring should have proper insulation.
- e. Electricians should be given proper education regarding electrocution.

### 2. Safe work Practices

- a. *prevention* of electrocution by taking the similar safety measures as mentioned above.
- b. No one who works with electric energy should work alone, and in many instances, a “buddy system” should be established. It may be advisable to have both members of the buddy system trained in CPR. Every individual who works with or around electrical energy should be familiar with emergency procedures. This should include knowing how to de-energize the electrical system before rescuing or beginning

resuscitation on a worker who remains in contact with an electrical energy source.

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# Emerging Importance of Coronary Heart Disease Risk Factors in India: A Population Based Study

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## ABSTRACT

**Objective:** The present study was carried out with the objective to determine and compare the prevalence of known risk factors of CHD in urban and rural communities of Delhi

**Methods:** A community-based epidemiological study from Delhi. The study was carried out by conducting a house-to-house survey. The subjects were interviewed using a pre-coded and pre-tested semi-structured schedule after getting informed verbal consent. The various known risk factors of CHD were assessed. Subjects were enquired about family history of CHD, smoking/tobacco use, alcohol intake, physical activity and mental stress. Anthropometric parameters such as height, weight, waist circumference and hip circumference of the subjects were recorded. Blood pressure, fasting blood sugar and serum cholesterol of the study subjects were also estimated.

**Results:** The prevalence of sedentary lifestyle, obesity, hypertension, diabetes mellitus and hypercholesterolemia were observed to be significantly higher among urban subjects as compared to rural subjects. Higher prevalence has been observed for truncal obesity and family history of CHD among the urban subjects as compared to that among rural subjects. However, difference in prevalence was not statistically significant. Smoking/tobacco use, stress and heavy alcohol intake were higher among the rural subjects than that among the urban subjects but again the difference was not statistically significant.

**Conclusion:** The present study clearly indicates that increasing prevalence of known risk factors of CHD in India is a major problem of public health importance in India. Urgent population-based measures are needed to control this trend in coronary risk factors for prevention of CHD in India.

**Keywords:** Prevalence, Risk Factors, CHD, Urban, Rural, Public Health

## INTRODUCTION

Coronary heart disease is now the leading cause of death worldwide<sup>1</sup>. More than 60% of the global burden of coronary heart disease occurs in developing countries. The current estimate of 25 million patients suffering from CHD in India is projected to increase to 40 million by the year 2020<sup>2</sup>.

The famous Framingham Heart Study<sup>3</sup> in USA played vital role in defining the risk factors for coronary heart disease in general population. Several studies have clearly shown that coronary heart disease is a significant problem in India. The coronary risk factors viz, hypertension, smoking, physical inactivity, obesity and truncal obesity, and improper diet leading to hypercholesterolemia and hypertriglyceridemia are also prevailing widely<sup>4</sup> in India.

The present study was carried out with the objective to determine and compare the prevalence of coronary heart disease and associated risk factors in urban and rural communities of Delhi.

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## MATERIALS AND METHOD

A community based epidemiological study was conducted on 1000 adults in the age group e" 20 years living in urban and rural areas of Delhi. Population of Gokulpuri and Yamuna Vihar was included as urban community and that of village Barwala was included as rural community.

A total of 500 subjects from the urban community (250 each from Gokulpuri and Yamuna Vihar) were included in the study. Similarly, another 500 subjects from the rural community (Village Barwala) were included in the study. A total of 250 households each from Gokulpuri and Yamuna Vihar were selected by systematic random sampling. A total of 500 households from Barwala were selected by simple random sampling. One person above 20 years of age from each household was selected by simple random sampling using lottery method.

The study was carried out by conducting a house-to-house survey. The subjects were interviewed using a pre-coded and pre-tested semi-structured schedule after getting informed verbal consent. The various risk factors of CHD were assessed. Subjects were enquired about smoking and tobacco use. For assessment of alcohol use, the subjects were enquired about the type of alcohol consumed i.e., whisky, beer, wine etc. and the amount of that particular variety of alcohol consumed per day. Alcohol intake more than 100ml/day was classified as heavy alcohol intake. Physical activity was assessed using the International Physical activity questionnaire short form<sup>5</sup>. Mental stress of the subjects was assessed using the Goldbergh Health Questionnaire-12 (GHQ-12)<sup>6</sup>. Family history of CHD among the subjects was also enquired. Anthropometric parameters such as height, weight, waist circumference and hip circumference of the subjects were recorded. Obesity was defined as BMI e" 30. Truncal obesity was defined as Waist-hip ratio > 0.85 in women and >1 in men<sup>7</sup>. Blood pressure of the subjects was recorded using the mercury sphygmomanometer. At least two blood pressure readings were taken at two separate visits and the average was recorded. Hypertension was diagnosed if the systolic blood pressure was > 140 mm of Hg or diastolic blood pressure was > 90 mm of Hg or the subject was a known hypertensive or taking antihypertensive drugs<sup>8,9</sup>. The subjects were called to the health centre for blood sugar estimation after an overnight fasting. Each subject was given three

reminders to get his/her fasting blood sugar estimation done after which he/she was declared as defaulter. The fasting blood sugar was recorded using the Accu check glucometer. Diabetes Mellitus was diagnosed if the fasting blood glucose levels were > 126 mg% or the subject was a known diabetic or taking antidiabetic drugs<sup>8,10</sup>. The serum lipid profile was measured for at least 10% of the subjects selected by a systematic random sampling method. The subjects were called after overnight fasting and their venous blood samples were drawn. Hypercholesterolemia was defined as serum cholesterol levels e" 200 mg/dl as per ATP -III classification<sup>11</sup>.

**Statistical Analysis:** Epi-Info software was used for statistical analysis.

## RESULTS

Table 1 depicts the socio-demographic profile of the study subjects. The study subjects in the urban area ranged from 20-87 years of age, whereas, the subjects in the rural area ranged from 20-90 years of age. The mean age of the urban subjects was 45.42±15.22 yrs while the mean age of the rural subjects was 44.32±15.79 yrs. amongst all study subjects, 43.5% of the subjects were males and 56.5% of the subjects were females. The overall literacy rate among study subjects was observed to be 77.3%.

Table 2 depicts prevalence of known risk factors of Coronary heart disease among study subjects. Sedentary lifestyle (low-moderate physical activity) was observed to be adopted by 64.0% of the subjects which was significantly higher ( $X^2=10.00$ ,  $df=1$ ,  $p<0.01$ ) in the urban area (68.8%) than that in the rural area (59.2%). Obesity was observed in 11.0% of the subjects being significantly higher ( $X^2=10.46$ ,  $df=1$ ,  $p<0.01$ ) among the urban subjects (14.2%) than that among the rural subjects (7.8%). Hypertension was observed in 40.3% of the subjects being significantly ( $X^2=22.15$ ,  $df=1$ ,  $p<0.01$ ) more in the urban area (47.6%) than that in the rural area (33.0%). Diabetes was found to be present in 13.3% of the subjects being again significantly ( $X^2=33.72$ ,  $df=1$ ,  $p<0.001$ ) higher among the urban subjects (21.4%) than that among the rural subjects (6.6%). Hypercholesterolemia was detected in 18.2% of the subjects being significantly ( $X^2=17.52$ ,  $df=1$ ,  $p<0.001$ ) greater in the urban area (35.9%) than that in the rural area (12.9%).



**Table 1. Socio-demographic profile of study subjects**

Characteristics	Urban (n=500)	Rural (n=500)	Total (N=1000)
<b>Age (years)</b>			
20-29	93(18.6)	95(19.0)	188(18.8)c
30-39	112(22.4)	128(25.6)	240(24.0)
40-49	87(17.4)	118(23.6)	205(20.5)
50-59	100(20.0)	65(13.0)	165(16.5)
60 and above	108(21.6)	94(18.8)	202(20.2)
Mean ± SD	45.42±15.22	44.32±15.79	44.87±15.52
<b>Gender</b>			
Male	211(42.2)	224(44.8)	435(43.5)a
Female	289(57.8)	276(55.2)	565(56.5)
<b>Educational status*</b>			
Illiterate	116(23.2)	111(22.2)	227(22.7)d
Primary/Just literate	61(12.2)	90(18.0)	151(15.1)
Middle school	73(14.6)	69(13.8)	142(14.2)
High school	67(13.4)	114(22.8)	181(18.1)
Intermediate/Post	69(13.8)	73(14.6)	142(14.2)
High school diploma			
Graduate	83(16.6)	28(5.6)	111(11.1)
PG/Professional	31(6.2)	15(3.0)	46(4.6)
<b>Occupation*</b>			
Unemployed	272(54.4)	288(57.6)	560(56.0)b
Unskilled	24(4.8)	31(6.2)	55(5.5)
Semi-skilled	37(7.4)	41(8.2)	78(7.8)
Skilled	46(9.2)	57(11.4)	103(10.3)
Clerical/Shop-owner/ Farm-owner	100(20.0)	75(15.0)	175(17.5)

Farm-owner

Figures in parenthesis are percentages

\* According to Modified Kuppusswamy classification

\*\* According to Mahajan-Gupta Socio-economic scale

a. p value not significant; b. p<0.05; c. p<0.01; d. p<0.001

**Table 2. Prevalence of known risk factors of Coronary heart disease among study Subjects**

Risk factor	Urban (n=500)	Rural (n=500)	Total (N=1000)
Smoking/tobacco use	148(29.6)	176(35.2)	324(32.4)a
Hypertension	238(47.6)	165(33.0)	403(40.3)c
Hypercholesterolemia*	23(35.9)	27(12.9)	50(18.2)c
Diabetes**	77(21.4)	28(6.6)	105(13.3)c
Obesity	71(14.2)	39(7.8)	110(11.0)b
Truncal obesity	288(57.6)	259(51.8)	547(54.7)a
Sedentary lifestyle	344(68.8)	296(59.2)	640(64.0)b
Family history of CHD	84(16.8)	73(14.6)	157(15.7)a
Stress	56(11.2)	63(12.6)	119(11.9)a
Heavy alcohol intake	8(1.6)	20(4.0)	28(2.8)a

Figures in parenthesis are percentages

\* Serum total cholesterol levels were available for 64 urban and 210 rural subjects

\*\* Fasting blood sugar levels were available for 360 urban and 425 rural subjects

a. p value not significant; b. p<0.01; c. p<0.001

## DISCUSSION

The prevalence of smoking/tobacco use in the rural area in the present study (35.2%) was observed to be higher than the other studies conducted among the rural populations by Gupta<sup>12</sup> (3.4%) in Rajasthan, Wander<sup>13</sup> (8.9%) in Punjab, Singh<sup>14</sup> (19.8%) in Uttar Pradesh and Agrawal<sup>15</sup> (16.0%) in Maharashtra but lower as compared to the study conducted by Chadha<sup>16</sup> (47.1%) in Delhi. The prevalence of smoking/tobacco use in the urban area (29.6%) in the present study was observed to be higher as compared to the earlier studies carried out by Gupta<sup>8</sup> (23.8%) in Jaipur in the year 2002, Chadha<sup>16</sup> (14.3%) in Delhi and Singh<sup>14</sup> (19.6%) in Moradabad but lower as compared to another study carried out by Gupta<sup>17</sup> (32%) in Jaipur in the year 1995.

The prevalence of family history of Coronary heart disease in the urban area (16.8%) in the present study was observed to be lower as compared to that reported by Chadha<sup>16</sup> (21.0%) in an urban population of Delhi. The prevalence of family history of Coronary heart disease in the rural area (14.6%) observed in the present study was much higher as compared to that reported by Chadha<sup>16</sup>.

In the present study, sedentary lifestyle was observed in 68.8% of the subjects in the urban area which was lower as compared to the studies carried out by Mohan<sup>18</sup> (81.2%) in Chennai and Gupta<sup>17</sup> (71%) in Jaipur in the year 1995 but higher than that reported by Gupta<sup>8</sup> (62%) in Jaipur in the year 2002. Sedentary lifestyle was observed among 59.2% of the subjects in the rural area in the present study which was lower than that reported by Gupta<sup>19</sup> (85%) in Rajasthan but almost similar to that reported by Wander<sup>13</sup> (58.5%) in Punjab.

In the present study, 14.2% of the urban subjects were obese which was observed to be higher than that reported by Singh<sup>14</sup> (12%) in Moradabad and Gupta<sup>17</sup> (11%) in the Jaipur in the year 1995 but lower than that reported by Gupta<sup>8</sup> (27%) in Jaipur in the year 2002. In the rural area, 7.8% of the subjects in the present study were obese which was higher than that reported by Gupta<sup>19</sup> (6%) in Rajasthan, Singh<sup>14</sup> (5.1%) in Uttar Pradesh and Agrawal<sup>15</sup> (3.2%) in Maharashtra. In the present study, truncal obesity was observed in 57.6% of the subjects in the urban area which was higher than that reported by Gupta<sup>17</sup> (21%) in Jaipur in the year 1995 and by Singh<sup>14</sup> (48.4%) in Moradabad but lower than that reported by Gupta<sup>8</sup> (63%) in Jaipur in the year 2002. Truncal obesity was observed among 51.8% of the

subjects in the rural area which was much higher than that reported by Gupta<sup>19</sup> (5%) in Rajasthan, Singh<sup>14</sup> (12.1%) in Uttar Pradesh and Agrawal<sup>15</sup> (18.5%) in Maharashtra.

Hypertension was observed in 47.6% of the subjects in the urban area in the present study which was much higher than that reported by Gupta in Jaipur in the year 1995<sup>17</sup>(31%) and in the year 2002<sup>8</sup>(37%) and by Singh<sup>14</sup> (24%) in Moradabad. In the rural area too, the prevalence of hypertension reported in the present study (33.0%) was observed to be higher than that reported by Gupta<sup>19</sup> (21%) in Rajasthan and Singh<sup>14</sup> (22.8%) in Uttar Pradesh.

The prevalence of diabetes mellitus in the urban area (21.4%) reported in the present study was much higher than that reported by Singh<sup>14</sup> (6%) in Moradabad, Chadha<sup>16</sup> (1.6%) in Delhi and by Gupta in Jaipur in the year 1995<sup>17</sup>(1%) and in the year 2002<sup>8</sup>(12%). The prevalence of diabetes mellitus in the rural area (6.6%) reported in the present study was also higher than that reported by Gupta<sup>19</sup> (0.2%) in Rajasthan, Chadha<sup>16</sup> (0.2%) in Delhi, Wander<sup>13</sup> (4.6%) in Punjab and Singh<sup>14</sup> (2.9%) in Uttar Pradesh.

Hypercholesterolemia was observed in 35.9% of the urban subjects in the present study which was higher than that reported by Singh<sup>14</sup> (34%) in Moradabad but lower than that reported by Gupta<sup>8</sup> (39.1%) in Jaipur. Hypercholesterolemia was observed in 12.9% of the rural subjects in the present study which was higher than that reported by Wander<sup>13</sup> (7%) in Punjab and Singh<sup>14</sup> (10.1%) in Uttar Pradesh but lower than that reported by Gupta<sup>19</sup> (22%) in Rajasthan.

### Conclusions and Recommendations

The urban way of living is leading to an increase in the prevalence of the known risk factors as well as the rate of coronary heart disease. It is possible that some urban Indian populations can benefit by reducing blood pressure, diabetes, obesity and increasing physical activity. Urgent population-based measures are needed to control this trend in coronary risk factors for prevention of CHD in India.

### ACKNOWLEDGEMENTS

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**Conflict of interest:** None

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# Prosthetic Rehabilitation of Edentulous Segmental Mandibulectomy Patient: A Case Report

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## ABSTRACT

An understanding of postsurgical anatomy and physiology is an obvious prerequisite to the development of new prosthetic procedures for mandibulectomy patients. Loss of the potential basal seat area, atrophic and fragile oral mucosa, reduction in salivary output, angular pathway of mandibular closure, deviation of the mandible and impairment of the motor and sensory control of the tongue, lips and cheeks makes the fabrication of a prosthesis difficult in these situations. Several prosthetic options include sectional prosthesis, use of palatal ramp, setting double rows of teeth on the unresected side in maxilla and use of functional chew in technique. This article describes the use of two rows of maxillary posterior teeth on the unresected side in a patient who had undergone segmental mandibulectomy. The inner row helped in restoring the function whereas the outer row helped in restoring the cheek support and esthetics.

**Keywords:** Mandibulectomy, Double rows of Teeth.

## INTRODUCTION

One of the most consistently difficult areas of maxillofacial rehabilitation is the treatment of edentulous patients who have had a radical cancer surgery of the tongue, floor of the mouth and mandible. Only a complete understanding will permit functional utilization of these unusual postoperative anatomic conditions.<sup>1</sup>

Cantor and Curtis<sup>1</sup> (1971) devised a prosthetic classification that is as follows:

- Class I: Mandibular resection involving alveolar defect with preservation of mandibular continuity
- Class II: Resection defects involve loss of mandibular continuity distal to the canine area
- Class III: Resection defect involves loss up to the mandibular midline region.

Class IV: Resection defect involves the lateral aspect of the mandible, but are augmented to maintain pseudoarticulation of bone and soft tissues in the region of the ascending ramus.

Class V: Resection defect involves the symphysis and parasymphysis region only, augmented to preserve bilateral temporomandibular articulations.

Class VI: Similar to class V, except that the mandibular continuity is not restored.

Schaaf<sup>2</sup> in 1976 have outlined various factors to be considered in partial mandibulectomy patient who are also completely edentulous. These are amount of mandible remaining, amount of deviation, remaining kinesthetic sense and control, actual present ridge relationship, nature of denture bearing areas, status of the patient's disease, type of the treatment patient has received, preoperative success with complete dentures and overall vigor of the patient.

Both mandibulectomy and Commando's procedure involve an extensive loss of tissues and associated function. The most significant difficulty encountered is mandibular deviation towards the defective side. The

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greater the loss of tissues, greater will be the deviation of the mandible to the resected side, thus compromising the prognosis of the prosthetic rehabilitation to a greater extent. Apart from deviation, other dysfunctions in such patients are observed in swallowing, speech, control of saliva, mandibular movements, mastication, respiration and psychic functioning.<sup>3</sup>

Treatment options are varied and several authors have taken different approaches in these situations. Swoope<sup>4</sup> described the use of palatal ramp prosthesis to correct deviation. However he believed in sectional mandibular complete dentures and said that nothing is gained by extension onto the movable and unsupported tissues of the surgical site. Schaaf<sup>2</sup> and Rosenthal<sup>5</sup> suggested setting of double rows of maxillary teeth on the unresected side. The inner row helped in restoring the function whereas the outer row helped in restoring the cheek support and enhancing the esthetics. The variations in closure of the jaws is observed in this technique on right and left side and then a central and relaxed position is recorded. Another technique by Cantor and Curtis<sup>6</sup> involved functional chew in of the maxillary posterior wax blocks while lower denture in mouth.

### CASE REPORT

A 48 yr old male patient reported to the Department of Prosthodontics, A.B. Shetty Memorial Institute of Dental Sciences, Mangalore after surgery and radiation for squamous cell carcinoma involving left alveolus. Segmental mandibulectomy and supraomohyoid neck dissection was performed six months back. Reconstruction was done using pectoralis major myocutaneous flap. Later he underwent post operative radiotherapy which is over 1 1/2 months back. This patient falls under class II of Cantor and Curtis classification.

Clinical examination revealed total edentulousness and missing left mandible from canine region onwards. There was severe mandibular deviation towards the resected side. As the patient was made to bring the mandible towards the right side, he complained of moderate pain in the right temporomandibular joint area. A decision was then made to fabricate the complete denture prosthesis in repeatable and relaxed position. As the deviation was marked, two rows of maxillary posterior teeth on the unresected side were planned.

Primary impressions were made using alginate (Neocolloid, Dentsply) with stock trays. Lower stock

tray was modified with modeling wax on the left side. Custom trays were fabricated using self cure resin (DPI-RR, Mumbai, India). Border moulding and secondary impression was made with greenstick compound and zinc oxide eugenol impression paste for maxillary arch while putty consistency (Zetaplus, Zhermac Clinical, Italy) and light body condensation silicone (Oranwash L, Zhermac Clinical, Italy) was used for mandibular arch (fig.1) and cast poured in dental stone (fig.2)

Self cure resin record bases were made and occlusion rims fabricated. Additional block of wax was put in maxillary posterior unresected segment to support the lower wax rim while the patient closes. Wax rims were then adjusted until a tentative vertical jaw relation is established. A face bow transfer was done and the maxillary cast mounted on Girrbacks (Artex) non arcon semi adjustable articulator. For horizontal registration, patient was made to bring his mandible to unresected side as far as possible without causing pain. The wax was softened and the position was sealed. The lower cast was mounted in this secured relation.

Teeth arrangement was done while arranging two rows of teeth (Acry rock, Ruthinium, Valsad, India) in the maxillary posterior unresected side. Try in of the waxed up denture was done and evaluated for esthetics, speech, occlusion and vertical dimension. The dentures were then characterized, processed and occlusion was adjusted (fig.3). After finishing and polishing, the prosthesis was inserted into the patient's mouth. Any occlusal interferences in normal range of movements were checked and corrected. Routine postinsertion instructions were given to the patient

### List of figures



Fig. 1. Mandibular secondary impression

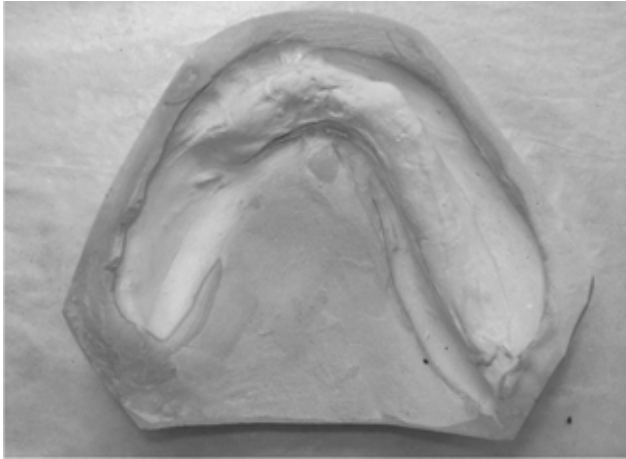


Fig. 2. Mandibular master cast



Fig. 5. Occlusion on the unresected side



Fig. 3. Processed complete dentures

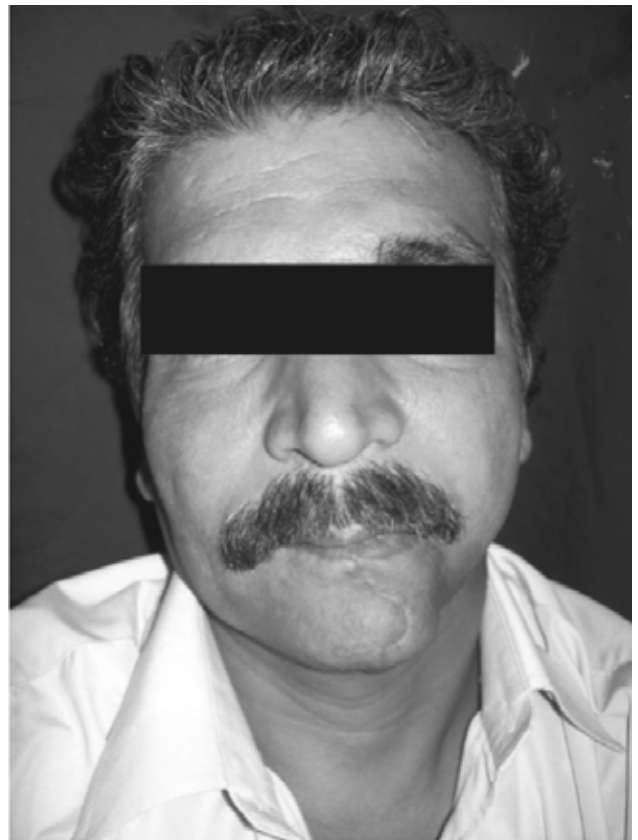


Fig. 6. Before prosthesis insertion



Fig. 4. Occlusion on the resected side

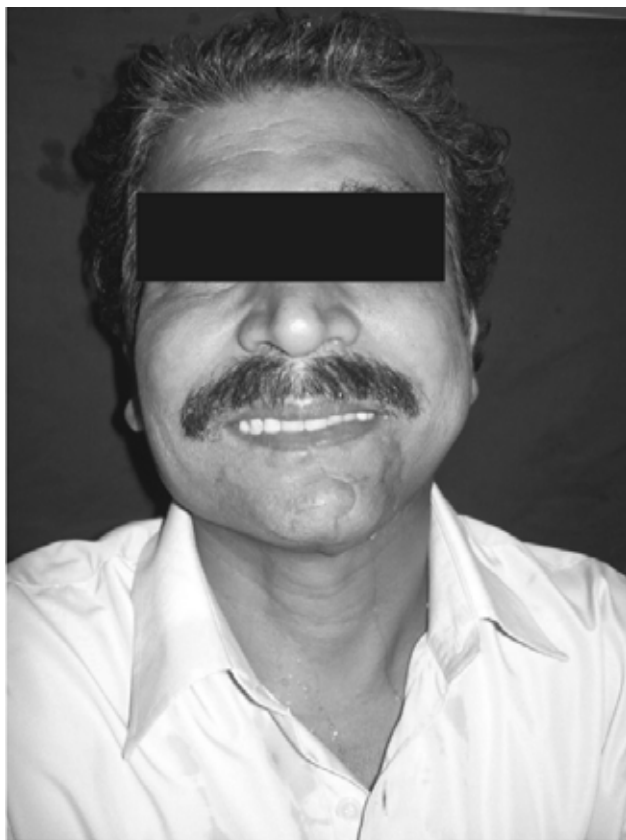


Fig.7 After prosthesis insertion

## DISCUSSION

Four most important factors that effect rehabilitation in mandibulectomy as listed by Cantor and Curtis are location and extent of surgery, effect of radiation therapy, the presence or absence of teeth and psychosocial factors.<sup>7</sup> Boucher stated that the amount of biting force tolerated by a denture is directly proportional to the size of tissue bearing area. Since mandibulectomy patients have markedly reduced masticatory strength and little hard and soft tissue support, it is important to record and utilize as broad a denture base area as possible.<sup>6</sup>

In many edentulous mandibulectomy patients, the guide flange is used as a training prosthesis, and its continued use can lead to eventual mandibular control without the prosthesis. However, patients who are edentulous in the maxilla or mandible or both usually cannot be considered for such a prosthesis because extreme mediolateral forces placed on the prosthesis may prevent maintenance of border seal and lead to denture instability.<sup>8</sup>

In this case, two rows of maxillary posterior teeth were arranged on the unresected side. This treatment modality is in accordance to case reports by Schaff<sup>2</sup> and Rosenthal.<sup>5</sup> Desjardins<sup>8</sup> also observed that in edentulous patients and in patients who cannot attain the ideal mediolateral relation of the remaining segment, a maxillary table can provide a surface against which the natural or artificial teeth of the mandible can occlude.

Also in this case, considerations were given to acceptance of an easily achievable maxillomandibular relationship rather than a strained one. This is in accordance with Desjardins<sup>8</sup> who stated that this easily attainable maxillomandibular relationship may be more conducive in achieving the goal of mandibular stability in the mandibular denture.

To conclude, in this segmental mandibulectomy case, successful rehabilitation has been achieved by the use of two rows of maxillary posterior teeth on the unresected side and this can be considered as a viable treatment option for these type of cases.

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# A Framework for Evaluation of Health Care Quality in India and Iran

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## ABSTRACT

The health scenario all over the world indicates that despite having numerous excellent health care facilities, there exists a sufficiently large gap between the demand and delivery. With increasing competition, advances in medical sciences, and rising patient expectations, the health care systems have become complex organizations. They need to obtain an optimum balance between the resources and patient satisfaction. Total quality management (TQM) has a great potential to address quality problems in a wide range of industries and improve the organizational performance. The growing need to take initiatives by hospitals in countries like India and Iran to improve the service quality and reduce wastage of resources has inspired the authors to develop a survey instrument to measure health care quality and performance. The data are collected from the capital cities and their nearby places in India and Iran. Using factor analysis, ten dimensions of quality practices and performance have been identified and validated empirically for the final version of the proposed framework.

**Keywords:** Healthcare, India, Iran, Total Quality Management.

## INTRODUCTION

Total quality management (TQM) has a great potential to address quality problems in a wide range of industries and improve the organizational performance<sup>1,2</sup>.

Juran<sup>3</sup> has defined TQM as a philosophy aimed at continuously improving the quality and process to achieve customer satisfaction. Simply stated, it is the building of quality into products and process making quality a concern and responsibility for everyone in the organization<sup>4</sup>.

Good health, responsiveness to the expectations of its people, and financial contribution to the nation are the goals for health care systems of a country<sup>5</sup>. An overview of the health scenario all over the world indicates that despite having numerous excellent health care facilities, there exists a sufficiently large gap between the demand and delivery. In India nearly one million people die every year due to inadequate health care and two-third population is deprived of specialist care<sup>6</sup>. The country spends US\$ 29 per capita on health with only 6 physicians available per 10, 000 persons<sup>7</sup>. The global health observatory<sup>7</sup> also reports a per capita expenditure of US\$ 215 on health in Iran. There are nine physicians working for every 10, 000 persons in Iran.

There are plenty of evidences available in the literature to the effect that TQM and performance

improvement have a positive relationship<sup>2, 8, 9, 10, 11, 12</sup>. The Malcolm Badrige quality award criteria too confirms such relationship between quality management practices and business results<sup>13</sup>.

TQM implementation and its effectiveness in health care has been a separate subject of research in service sector. Researches in this area have been addressing the issues like development of survey instrument, framework of service quality, barriers and challenges, and adaptation of various TQM models like MBNQA and EFQM Excellence model<sup>14</sup>. In Indian context, Duggirala *et al.*<sup>15</sup> have proposed a questionnaire for hospitals to examine the quality of care being delivered by them to the patients. Extending the framework proposed by Duggirala *et al.*<sup>15</sup>, Padma *et al.*<sup>16</sup> have developed a more comprehensive conceptual survey instrument to determine the quality of health care in India from the viewpoints of patients as well as their attendants. Though there are evidences of recent studies in Iran<sup>17, 18</sup> also pertaining to total quality management and performance in health care, none of them claims for having developed a framework for measuring health care quality. The present study is different in two aspects from the most recently published literature (for example 15, 16, 17, and 18) on this subject. The first aspect of difference is that the data are collected from two different countries and the second difference is that the model determines the quality of care from the viewpoint of the service providers and benchmarks the quality with the Baldrige criteria.



## OBJECTIVES AND METHODOLOGY

The current state of research in the area of health care quality along with the inadequacy and cost of health care services in India and Iran has inspired the authors to develop and validate a framework for the health care industry to measure its quality practices and performance. In addition to the information gathered through literature survey, two documents, namely, guidelines for hospitals in pursuit of excellence<sup>19</sup>, and the Baldrige health care criteria for performance excellence<sup>20</sup> have been used to develop an initial questionnaire. The data are gathered through this questionnaire from the sample health care organizations in India and Iran. Hospitals from the capital cities and their adjoining areas, representing the government, semi-government, private, small, medium, and large types were contacted on convenience basis. The respondents, by and large, were middle-level administrators, mostly qualified doctors. After scrutinizing and editing the filled-in questionnaires, 110 were finally compiled for further processing. Out of which, 50 are from India and the remaining 60 from Iran.

### The Proposed Framework

The Malcom Baldrige National Quality Program, in the context of health care (Figure-1), defines performance as the outcomes of various processes that permit evaluation and comparison relative to goals, standards, past results, and other organizations. The American Hospital Association (AHA) has presented a report on the efforts put in and the results achieved by various hospitals that have been pursuing excellence in accordance with the 6 IOM (Institute of Medicine) aims<sup>19</sup>. These six aims, namely, safe, timely, effective, efficient, equitable, and patient-centered health care are popularly abbreviated as STEEEP.

For the development of an instrument to measure health care performance, 67 items are initially identified to cover the various aspects of health services. The first 50 items of this instrument describe the efforts and approaches that health care organizations are supposed to employ in order to improve the quality of the services and enhance the patient satisfaction. Another set of 17 items have been designed to measure the outcomes of such efforts. The responses are measured on a 5-point Likert scale ranging from very high (1) to very low (5) through high (2), medium (3) and low (4).

In order to arrive at a manageable instrument, the 67 variables are factor analysed. Prior to conduct this analysis the null hypothesis that "the correlation matrix of the variables is an identity matrix" was examined

using the Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) method was used to measure sampling adequacy. The sample was found to be adequate (KMO = 0.848) and the test has rejected the null hypothesis (the approximate value of the chi-square statistic = 6411.479, df = 2211, significance = .000). This suggested the appropriateness of using factor analysis for the 67 x 110 data matrix (67 items and 110 respondents). Principal component analysis (PCA) of the data, using the eigenvalue and scree plot methods, reduced the 67 items to 10 factors (or constructs). The Kaiser criterion has been followed to for this purpose<sup>21</sup>. Factor loadings below 0.4 have been suppressed as they are less significant. The resulted component matrix was rotated using the varimax method to obtain a rotated component matrix<sup>21</sup>. A reliability analysis was run to check the reliability of the scale that has been developed as an instrument to measure health care performance. To take care of the reverse-phrased statements, scores were reversed before conducting the reliability test. Cronbach's  $\alpha$  was used as the criterion for retaining or dropping a particular item from the scale. A value of  $\alpha \leq 0.6$  generally indicates unsatisfactory internal consistency reliability and hence any construct bearing  $\alpha$  value less than or equal to 0.6 is considered unreliable<sup>22</sup>. Accordingly, some items have been dropped before arriving at the final version of the survey instrument.

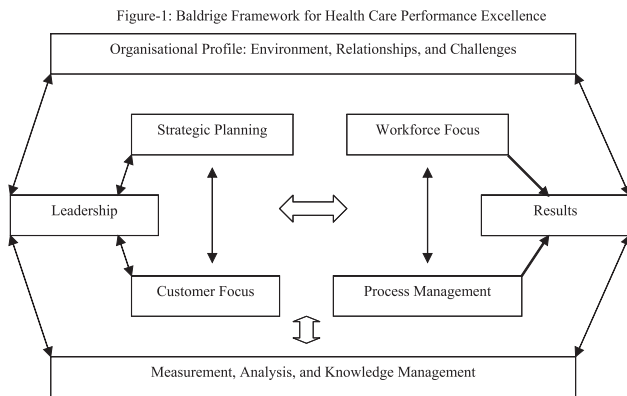
The 10 constructs so extracted, consisting of 58 items, account for a cumulative 68.925 per cent of the total variance. The following paragraphs discuss the 10 constructs. The first eight constructs indicate the TQM practices of hospitals and the remaining two are indicative of the TQM performance.

**Patient Focus (C1):** This factor describes how hospitals address the needs, feedbacks, and complaints of their patients. This also indicates improvement in patient satisfaction due to various quality measures taken by the responding organizations.

**Quality Planning (C2):** This construct reflects the commitment of leadership towards quality and innovation, quality of information to formulate competitive strategies, and quality of the infrastructure to provide excellent services.

**Workforce and Process (C3):** Embraces various aspects of quality related to the workforce and processes. Freedom to learn and share ideas, work conditions and compensation, process design, adoption of latest techniques and practices, and efforts to ensure quality supplies, etc. are among the major issues covered under this factor.

Figure-1: Baldrige Framework for Health Care Performance Excellence



**Setting (C4):** The factor deals with the information on risks, challenges, and opportunities for setting goals and preparing the action plans.

**Leadership (C5):** Reflects the involvement and role of leadership in ensuring value addition for patients and other stakeholders.

**Work Environment (C6):** The factor describes the environment in terms of the coordination among various groups of people working for providing excellent health services, technology, and safety of the people.

**Communication (C7):** Another aspect of quality environment is the extent to which people can communicate without barriers. Measures how open the system is for everyone to participate and contribute towards quality outcomes.

**Knowledge Management (C8):** Quality of knowledge data base that can be used to improve health care services has been the focus of this factor.

**Non-financial Performance (C9):** Reflects the non-financial outcomes of TQM implementation in the sample health care services.

**Financial Performance (C10):** It measures improvement in profitability due to the TQM efforts applied by the health care systems

The quality constructs discussed above seem to be fairly compatible with the Baldrige framework for health care performance excellence (Figure-1). C5 (leadership) is similar to the *leadership* in the Baldrige criteria, C1 (patient-focus) matches with *customer focus*, and C2 (quality planning) along with C4 (goal setting) come

under *strategic planning*. Similarly, constructs 3 and 6 (workforce and process and work environment) deal with the aspects related to *workforce focus* and *process management*. C8 along with C4 take care of the measures concerned with *measurement, analysis and knowledge management*. A new dimension has emerged in the form of C7 (communication) which can be attributed to various two-headed arrows in the figure. Constructs 9 and 10 represent the *results* criterion of the Baldrige model.

The Baldrige criteria address four domains of performance- health care process and outcome; patient- and stakeholder- focused; financial and market place; and operational. The items of *results* can be classified accordingly to match with this sub-classification of performance. The health care processes and outcomes are indicated by variables 54, 56, 59, 60, and 61. Another set of variables (51, 52, 53, 55, 62, 63, and 64) is a measure of the patient- and stakeholder-focused performance. A single variable measuring financial performance is 67. The operational performance is illustrated by variables 57, 58, and 66.

While referring to the AHA guidelines<sup>19</sup>, hospitals need to achieve excellence in clinical, operational, and financial performance. The variables constituting *results* are found to cover measurement of these three types of performance, for example, variables 51, 52, and 54 indicate clinical performance; operational aspects are reflected in variables like 53, 56, and 59; whereas, variables 64 and 67 are indicative of financial performance. Also, these variables are likely to take care of safety (51, 54), timeliness (56, 57), effectiveness (59, 66), efficiency (58), equitability (64), and patient-orientation (55, 62, 63). *The numbers in parentheses show illustrative items representing the respective aims. Due to space constraints, the initial list of 67 items as well as the final proposed framework are not included in this manuscript.*

Correlation analysis has been conducted to determine the extent and significance of correlations among the 10 constructs of health care quality measures and performance. Average scores of the respondents on each factor are tested to compute the correlations. All the 10 constructs of quality and performance are found significantly correlated (at either 0.05 or 0.01 significance level) with each other. The result is well supported by previous studies<sup>23</sup> and also confirms that the Baldrige criteria for health care performance excellence are highly related.

## CONCLUSIONS

The performance measurement areas in health care systems include population health, health outcomes of individuals, quality and appropriateness of clinical care, responsiveness of the system, equity, and productivity<sup>24</sup>. A health care performance measurement system should, therefore, be designed to monitor and evaluate the extent to which these aspects of the health system meet their key objectives.

The growing need to take initiatives by hospitals in countries like India and Iran to improve the service quality and reduce wastage of resources, a framework has been proposed to measure the quality practices and their results. The framework consists of ten dimensions of quality and performance. The dimensions are then compared with the Baldrige framework<sup>20</sup>, a guide suggested by the American Hospital Association<sup>19</sup>, and the background document of the WHO European conference (2008) on health systems<sup>25</sup>. All the ten dimensions correlate significantly with each other are found matching with these three standards for health care performance systems.

Though quite a large number of people visit outpatient departments of hospitals, the present research examines only the inpatient and emergency services. Some of the hospitals in the sample are attached to medical colleges which altogether have a different orientation. The findings are likely to have been affected by this fact also. Such limitations may be taken care of by future researchers to widen the scope and improve the robustness of the instrument proposed to measure the quality and performance of health care services.

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# Assessment of Awareness of Rural Women towards HIV/AIDS in Ernakulam District, Kerala

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## ABSTRACT

**Background:** AIDS is spreading at an alarming rate among women. UNAIDS figures state that 0.8% of the total adult population (15-45yrs) in India is living with HIV/AIDS, of which 1.5% million are women. So the assessment of rural women towards HIV/AIDS is important.

**Objective:** The study was undertaken to assess the knowledge level of rural women in Kerala regarding various modes of transmission of HIV/AIDS.

**Methods:** This was a cross sectional descriptive study, a sample of 400 rural women of 15-45 years were randomly selected from Choornikara Panchayath area in Ernakulam District by applying simple random sampling method. Structured Interview schedule was used for collecting the data.

**Result:** 17% of women knew all modes of disease transmission and 27% of them knew only two modes. 52% responded sex is the common way of transmission and 19% said that blood is the effective way of transmission.

**Conclusion:** Sexual subordination due to socio-economic factors lack women of their power to negotiate against unsafe sex and the awareness is the only tool to prevent them from the enormity of the problem.

**Keywords:** *HIV/AIDS, Assessment, Awareness, Women, Rural Population.*

## INTRODUCTION

AIDS, the acquired immune-deficiency Syndrome remains as huge threat to humanity. According to UNAIDS around 4.7 million adults are living with HIV in Asia and approximately 35% of whom are women.<sup>1</sup> In India, according to the National AIDS Control Organisation (NACO), it is 2.4 million, where women account for 39.3 percent of these.<sup>2</sup> Sex wise statistics from all over the world reflected the fact that the HIV/AIDS epidemic is increasingly affecting women and young girls, especially where heterosexual sex is the main mode of transmission and it is highly concentrated on women reside in rural areas.<sup>3</sup> The reports from India also strongly highlights the fact that the infection is spreading more from urban to rural areas and from high risk groups to general population and the worse thing is that an alarming proportion of young people especially women have been infected by the disease.

## MATERIALS AND METHOD

The present study was undertaken to assess the awareness of rural women within the age group of 15-45 years towards the modes of transmission of HIV/

AIDS. The study was a cross-sectional descriptive one and sample size estimated on the basis of pilot study. A sample of 400 women was selected from two wards of Choornikara Panchayat of Aluva Taluk in Ernakulam district by using simple random sampling method. A Structured interview schedule was used as tool which comprised of questions to assess their knowledge regarding various modes of transmission of disease. All questions were pre-tested in 10-15 cases before putting the schedule into actual data collection and necessary modifications were done in order to get more valid data. Descriptive statistics was applied for data analysis.

## FINDINGS

The socio-demographic profile reveals that the sample comprised of 68.5% Hindus, 23.5% Muslims and 8% Christians. 94.25% were married women, 4.5% single, 0.7% separated and 0.5% were widows. 6.25% were daily wage earners and the remaining was unemployed. Their educational status varied from Illiteracy to high school education with 1.25% Illiterate and 2.5% with high school education; 62.25% had up to upper primary level of education.

Out of 400 study population, only 17% of them knew the all modes of transmission about infection correctly and 27% answered only two acceptable modes of transmission of the infection. 52% said that sex as the common mode of transmission of HIV/AIDS. 19% responded that blood as the most effective way of disease transmission. In our study 29% women answered infection can be transmitted through contaminated food and water. 45% thought that it was not safe to hug or kiss, shake hands with a friend who has HIV/AIDS. 32% said that infection is transmitted through vectors.

## DISCUSSION

In World wide estimation of HIV/AIDS infection, South Africa is reported to have the largest population living with the disease, at well over 5 million people infected followed by Nigeria in 2<sup>nd</sup> place and India being the 3<sup>rd</sup> largest population of HIV infected with more than 2 million people reported.<sup>4</sup> Nation wide Surveys from Nigeria and Ethiopia reported that prevalence rate now increase more among women in rural areas and their awareness were comparatively low.<sup>5</sup> It is very fearful that India drives in the same track and a comparison study of prevalence of HIV in rural and urban areas of Tamilnadu revealed that in the ratio of 2.1: 0.7.

In the general population women are more vulnerable to the infection especially in rural areas who are perceived to be at low risk of HIV infection because it is not common to have more than one lifetime sexual partner, a number of women getting infection only because of their husbands having unprotected sex outside of marriage or injecting drugs. Kerala has high literacy and poor industrial development, as a result of which, there is considerable migration to other states and to the Arabian Gulf countries for work and these migrants lack proper urban housing facilities and leave their families behind. Most of the men have been infected in cities outside the state through sex with female sex workers and infected men in turn infect their wives.<sup>6</sup> Surveillance data shows that more than 79% of HIV infections in the state were acquired heterosexually and that only about 2% was acquired through blood transfusion and about 5% through injecting drug use<sup>7</sup>. Most of the women who are positive have been infected by their own husbands and now infants are also being identified who have been infected through their mothers.

According to American Family Physician journal, the sexual transmissibility of the virus from men to women is much greater, up to 19 times more effective than the transmission from women to men. It is true that women are physically more susceptible to HIV infection than men and gender-based violence makes

them even more vulnerable. Disease progression in both men and women are similar and treatment methods are the same, but according to a study published in the December 28, 1994 issue of the journal of the American Medical Association, women have poorer survival rates than men. In addition, women have complications, mainly gynaecological disorders due to HIV/AIDS that can have very adverse effects. Pelvic inflammatory disease and vaginal candidiasis are particularly common and difficult to treat in infected women. An estimated 84% of infected women are between the ages of 15-45yrs, the prime child bearing years. This significant proportion of children have had acquired infection from their infected mother while in womb, during the birth process, or through breast feeding<sup>8</sup>. The drugs can help to decrease the chance of vertical transmission, but nothing is completely effective. A high incidence rate in the recent studies indicates that new infections have continued to occur. As heterosexual contact is being common mode of transmission for women infected with the disease, followed by intravenous drug usage, women should be especially concerned about transmitting this disease through sexual contact and this is one of the important missing points in the current AIDS education. According to Kalpana Jain<sup>9</sup>, abstinence and safe sex were repeatedly taught and encouraged in the class room, teachers fail in explaining how important it is for women to protect themselves. The root cause of high prevalence of this infection is the lack of awareness among them regarding the disease.

National behavioural study of nearly 85,000 people in 2001, only 75% of respondents had heard of AIDS and awareness was particularly low among rural women in Bihar, Gujarat and West Bengal. Less than 33% of all respondents had heard of sexually transmitted infections and only 21% were aware of the links between sexually transmitted infections and HIV<sup>10</sup>. Sentinel site behavioural surveillance has also highly specified about the low level awareness of rural women regarding HIV/AIDS especially in Bihar, Gujarat and Uttarpradesh<sup>10</sup>. The present study was conducted among the rural women in the Ernakulam district of Kerala and in the study all women were heard about HIV/AIDS. In 1996 Kerala Family Health Survey revealed that 13% of them had not heard of HIV/AIDS.<sup>11</sup> According to National Family Health Survey(NFHS-3) in 2005-2006, 96% of urban women heard of AIDS instead of 94.3% rural women.<sup>12</sup> A study conducted by S. Lahiri et al<sup>13</sup> among women from 13 states of India showed that only about 1/ 6<sup>th</sup> of rural women had heard of AIDS and 18% could not answer even one mode of disease transmission and the reported greatest knowledge was among urban residents and more educated group. While 17% knew about all modes of

transmission of AIDS in the present study, Kunte et al<sup>14</sup> found out that in their study among pregnant women, 32% of them knew about all modes of transmission. In the study on awareness of RTI, STI & AIDS in Jharkand revealed that<sup>11</sup> knowledge on HIV/AIDS varies from 5.9% to 45.1% in rural areas.

While 19% of rural women in the present study were conscious about the effectiveness of blood as easy mode of disease transmission, only 0.2% of Jharkand rural women supported the same opinion.<sup>15</sup>

In Jharkand study Dilip et al<sup>15</sup> reported that only 28% were sure that sex as the common mode of infection compared to 52% in present study. Bibi et al<sup>16</sup> revealed that in their study 64.6% were confident that insect bite was not the causative factor for AIDS while 68.5% supported it in the present study. In Bibi et al's study 12 25% responded that touching, kissing/ shaking hands can spread Infection while present study population showed 55%. Even though Kerala is being high literate state in India, the gaps in knowledge on modes of transmission were high among them. Low social status, cultural norms of sexual ignorance and discrimination against them block women of their access to information regarding HIV/AIDS and this fails the women to demand the preventive measures of this disease.<sup>17</sup> So it is the late time for reorienting the on going HIV/AIDS awareness programmes focusing more on women's health and health educators should empower young women and encourage them to have more control over their sexuality. More than any vaccine, women's empowerment may be the most effective way to control the spread of HIV infection. The turning point in the epidemic will come when women can say NO to unsafe sex, have their own access to preventive methods, and be educated sufficiently to earn a living which places a value on them as contributing members of the community.

### CONCLUSION

Many studies in India have showed the existence of widespread awareness on the basic information regarding the AIDS, but there is often inadequate understanding of the problem. Even though people have been bombarded with AIDS propaganda, they remain poorly informed. These gaps could be effectively filled by imparting health education through innovative and attractive strategies. It is therefore most important that every woman, even in high literate states should have access to information about HIV/AIDS to protect herself. In the absence of vaccines, treatments and cures of the infection, education leading to knowledge about the epidemic and behaviour change is the only way to inhibit transmission of HIV. If the women succeed to oppose the unsafe sex they can control this epidemic

and can prevent the new generation, for which awareness building is important.

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# Calcifying Odontogenic Cyst a Rare Presentation - Case Report

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## ABSTRACT

Calcifying Odontogenic cyst is a rare Odontogenic cyst represents 1% of the dental cysts. It is well known to clinicians and pathologists but regarding sub types there are still controversies. It may arise from odontogenic epithelial rests present in the maxilla, jaw or gums. Our case is a 64 years male with an asymptomatic swelling on the left mandibular ramus with a 2x2cms radiolucent lesion with tiny flecks of radiopacities. Histopathologically cyst lined by 2-3 layered columnar cells in palisading pattern, ghost cells and calcifications confirmed the diagnosis.

**Keywords:** Mandibular Ramus Cyst, Calcifying Odontogenic Cyst.

## INTRODUCTION

The Calcifying odontogenic cyst is a unique odontogenic lesion. Gorlin et al first identified in 1962 as Calcifying epithelial odontogenic cyst. The entity named after him as Gorlin cyst. This lesion previously described in German literature in 1932 by Rywkind<sup>[1]</sup>. In 1971 WHO labeled it as non neoplastic cystic lesion. In 1981 Praetorius et al renamed it as Calcifying odontogenic cyst. Because of its histological complexity & morphological diversity it was classified under odontogenic tumours in 1992 by WHO then renamed as Calcifying cystic odontogenic tumour in 2005<sup>[2]</sup>. It arises from odontogenic epithelial rests [rests of Serres] present in the maxilla, jaw or gum<sup>[3]</sup>. So they are cysts of primordial origin but not associated with crown of an impacted tooth<sup>[4]</sup>. It has cystic as well as solid neoplastic features. More solid lesions called Odontogenic ghost cell tumours. Previously it is misdiagnosed as a variant of ameloblastoma. Calcifying odontogenic cyst may be associated with Odontomas commonly [20%] and

Adenomatoid odontogenic tumour or Ameloblastoma rarely<sup>[5]</sup>. Calcifying odontogenic cyst is a rare lesion representing about 1% of jaw cysts. Age incidence is from 1<sup>st</sup> decade to 8<sup>th</sup> decade<sup>[3]</sup>. But greater incidence observed in 2<sup>nd</sup> decade and second peak in 6<sup>th</sup> or 7<sup>th</sup> decades<sup>[1]</sup>. It effects in same proportion in the maxilla & jaw. Common in the dentured zones of tooth. Greater incidence before first molar area. No gender or race predilection<sup>[3]</sup>.

It may occur in a central (Intra osseous) or peripheral (Extra osseous) location. The most frequent sign is painless hard swelling in the jaws, which produces expansion of bone. Only accidental radiographic finding in small lesions. 13 to 30 % lesions are Peripheral calcifying odontogenic cysts, located on the gingiva as painless, circumscribed pink sessile or pedunculated nodules. Peripheral type more common in older patients above 50 years, less aggressive and recurrences not reported. Proliferative activity of epithelium was greater in the central type. Characteristically the lesions are radiolucent & radiopaque<sup>[5]</sup>.

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## CASE REPORT

A male patient aged 64 years complaining of swelling at the left mandible since one month. No pain & no other abnormalities. No lymphadenopathy. Non



tender diffuse swelling is seen extra orally at the angle of the left mandible. No rise of local temperature. Intra orally an oval swelling is seen at the ramus of the mandible. Hard on palpation. Overlying mucosa is normal [Fig. 1]. Patient is a known diabetic & hypertensive. Routine laboratory investigations are within normal limits. Radiological features show a circumscribed 2x2 cm radiolucent lesion with tiny flecks of radiopacities with sclerotic boarder [Fig.2]. Straw colored fluid obtained by fine needle aspiration show occasional anucleated cells. Cyst enucleated under general anesthesia [Fig.3] and submitted for histopathological examination. Microscopic features show cyst wall lined by 2to3 cell thickness of ameloblast like cuboidal cells with loosely arranged ghost cells and calcifications, which confirms the diagnosis Calcifying odontogenic cyst[Fig.4&5]. No complications and no clinical or radiological signs of recurrence.

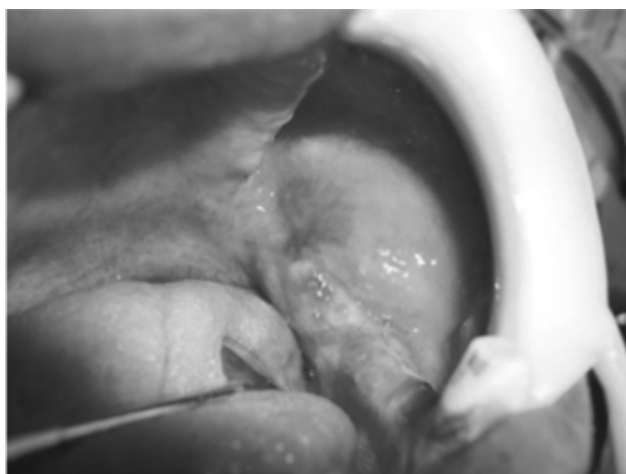


Fig. 1. Intra oral photograph showing swelling in relation to Left angle-ramus region of mandible.



Fig. 2. Radiographic picture showing 2x2 cm well defined radiolucency in relation to left angle-ramus region with flecks of radiopacities.



Fig. 3. Intra oral photograph showing bony cavity after cystic enucleation.

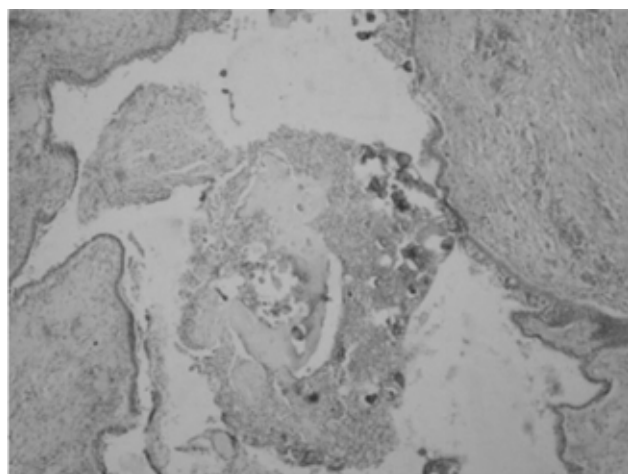


Fig.4. Histopathological picture of Calcifying odontogenic cyst [H&E X50].

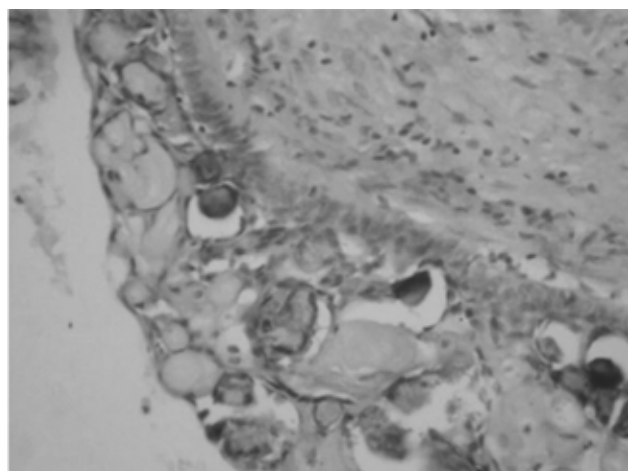


Fig.5. Histopathological picture of Calcifying odontogenic cyst lined by 2-3 layered columnar cells in palisading pattern, ghost cells and Calcifications [H&E X600].

## DISCUSSION

Calcifying odontogenic cyst or Gorlin cyst is an unusual and unique lesion. There may be variants of Calcifying odontogenic cyst according to clinical, histopathological & radiological characters. Praetorius et al in 1981 classified Calcifying odontogenic cyst by its morphologic & neoplastic variations.

- |                                    |  |
|------------------------------------|--|
| 1. Cystic form<br>[Non neoplastic] | a. Type 1a - Simple unicystic<br>b. Type 1b - odontome producing<br>c. Type 1c - Ameloblastomatous proliferating |
| 2. Solid form                      | Odontogenic ghost cell tumour<br>[or]<br>Dentinogenic ghost cell tumour  |

Cystic form found in 80-98% cases and solid form in 2-14% cases<sup>[1]</sup>. Fluid obtained from aspiration confirmed the cystic nature of the lesion. So our case is also a common cystic form classified under Type 1 a. Calcifying odontogenic cyst usually introsseous in 70% cases and extrososseous in 16-22% cases. In the present case the lesion is introsseous. It is equally distributed in both jaws and commonly anterior to 1<sup>st</sup> molar region<sup>[6]</sup>. 65% cases are found in the incisor & canine areas<sup>[5]</sup>. In our study the cyst located in the left ramus of the mandible which is unusual site.

Neoplastic variant of Calcifying odontogenic cyst may be a benign or malignant, which account for 2 to 14%. These forms show male preponderance & mandibular preference<sup>[1]</sup>.

Radiologically majority of the lesions are unilocular but 5-13% are multilocular. Characteristically the lesions are radiolucent & radiopaque<sup>[1]</sup>. In the early stages lesions are completely radiolucent. As they mature become well circumscribed and develop calcifications and become radiopaque<sup>[4]</sup>. In 1/3 to 1/2 of cases show radiopacities, which are irregular calcifications or tooth like densities<sup>[5]</sup>.

Three patterns of radiopacities observed<sup>[4]</sup>:

1. Salt & pepper pattern of flecks
2. Fluffy cloud like pattern throughout
3. Crescent shaped [new moon like configuration]

Unilocular radiolucent lesion with flecks of radiopacities seen in the present case. The size of the cyst may be 1 to 8 cm and average size may be 3 cm<sup>[4]</sup>. Depending on the chronicity the size may be increased

and become multilocular radiolucency. Cortical bone is thinned, expanded or perforated shows diffuse unilocular radiolucency<sup>[2]</sup>. Displacement of teeth may be seen. Introsseous Calcifying odontogenic cyst in relation to unerupted teeth has been reported in 1/3 of cases, most often a canine<sup>[5]</sup>.

Radiologically the following lesions may be differentiated from Calcifying odontogenic cyst<sup>[1]</sup>:

- |                   |   |
|-------------------|---|
| A. Introsseous:   | 1. Dentigerous cyst                         |
| Early stages -    | 2. Odontogenic keratocyst                   |
|                   | 3. Unicystic keratoblastoma                 |
| Late stages -     | 4. Adenomatoid odontogenic tumour           |
|                   | 5. Calcifying epithelial odontogenic tumour |
|                   | 6. Ameloblastic fibro odontome              |
| B. Extrososseous: | 1. Gingival fibroma                         |
|                   | 2. Gingival cyst                            |
|                   | 3. Peripheral giant cell granuloma          |

Histopathological picture confirms the diagnosis. Haematoxylin & eosin sections show fibrous cyst wall lined by odontogenic epithelium. Basal layer made up of ameloblast like columnar or cuboidal cells, 4 to 10 cell thickness with palisading pattern. Above this lining loosely arranged epithelial cells with faint cell & nuclear outlines, which are eosinophilic & devoid of nuclei, called Ghost cells. The principle characteristic of Calcifying odontogenic cyst is presence of variable number of ghost cells<sup>[1]</sup>. In some cases cystic lumen largely filled with masses of ghost cells. The nature of ghost cell-change is controversial. Some believe that this change represents coagulation necrosis or accumulation of enamel proteins. Others believe it is a form of normal or aberrant keratinization of odontogenic epithelium. Mass of ghost cells may fuse to form large sheets of amorphous acellular material. Dystrophic calcification within the ghost cells is common. Fine basophilic granules increase in size and form extensive masses of calcified material. Multiple daughter cysts may be present within the fibrous wall. Foreign body reaction to herniated ghost cells may be conspicuous. Histopathologically Ameloblastoma also lined by polarized columnar basal cells but no ghost cells<sup>[5]</sup>. All the typical histopathological features are seen in the present case.

Van.Gieson special-stain stains ghost cells yellow and dentinoid into red<sup>[8]</sup>. Special-stain not done in our case because histopathology itself is evident.

Ghost cells are not unique to Calcifying odontogenic cyst, but also seen in the following conditions<sup>[3]</sup>:

1. Malherbe calcificant epithelioma of the skin
2. Ameloblastic fibro odontome
3. Complex & compound odontome
4. Craneopharyngioma
5. Meloblastoma
6. Carcinoma

In Malherbe calcificant epithelioma of the skin the enamel - related proteins are absent<sup>[9]</sup>. The other histopathological features of the above lesions are different from Calcifying odontogenic cyst. Immunohistochemistry was positive for cytokeratins 8, 14, 19, AE 1/AE 3 & 34 Beta E12 and bcl-2 in all cases of Calcifying odontogenic cyst<sup>[7]</sup>.

In introsseous variety recurrences reported<sup>[3]</sup>. In this case no complications and no clinical or radiological signs of recurrence.

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# A Study of Prevalence of Intestinal Helminthiasis in Children of Davangere District of Karnataka

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## ABSTRACT

The present study was conducted to know the prevalence and spectrum of the helminthiasis in this part of the country. Of the 1000 children, whose stool sample was examined, 282 (28.2%) showed the presence of one or the other helminthic infestation. Ascariasis was found in 19.2% of the cases, ankylostomiasis in 3.4%, H.nana in 1.7%, Trichuris trichura in 2% and oxyuriasis in 1.4%. Ascariasis was found to be more common in preschool children (63%). All types of worm infestation showed an inclination towards male sex. Majority of the ascariasis and oxyuriasis infestation occurred in the urban population while ankylostoma infestation occurred mainly in rural population. Much can be done by educating the people regarding sanitation, health and to live healthy life with the available limited resources and thus help in bringing down the prevalence of infestations and the miseries produced by them.

## INTRODUCTION

The word 'helminth' is derived from the Greek and means worm. The disease produced by these is known as helminthiasis. It is a major public health problem, known to mankind from the prehistoric times (1600 B.C). The prevalence of these infestations is determined by various factors such as geographical, climatic conditions, social customs, cultural prejudices, individual habits prevailing in these areas.

Intestinal helminthic infections are acquired by feco-oral route. Because of their habits and opportunity for exposure, children easily acquire these infestations and they are more likely to manifest acute syndromes, due to ill developed immunity and lack of tolerance against these worms.

The low incidence and low prevalence of these infestations in western world are due to the high standard of living, good community sanitation, individual personal hygiene and health education.

## AIM AND OBJECTIVES

To know the prevalence and type of helminthiasis in children of Davangere district.

## MATERIALS AND METHOD

The present study was carried out in a tertiary care

hospital at Davangere, a district located in the central part of Karnataka. Study material consisted of about 1000 children who had their stools examined irrespective of the disease for which they were admitted. Among them 580 were males and 420 were females. 869 were from urban area and 131 were from rural area. Detailed clinical examination was done for all the children who showed helminthic ova in their stools. Macroscopic as well as microscopic examinations of the stools were done. Microscopic examination was done by preparing saline and iodine smears. Stool was also examined by brine floatation technique. Incidence of helminthiasis was determined by the presence of helminthic ova or larva in any one of the films.

Hundred children apart from the above 1000 were subjected to cellophane tape technique to find out the true incidence of oxyuris vermicularis infestation. The cellophane tape was flattened out on a clean glass slide and examined under the microscope after putting a drop of toluene.

## OBSERVATIONS

The following observations were made:

Of the 1000 stool samples examined 282 (28.2%) samples showed the presence of ova.

**Table 1. Spectrum of helminthiasis in 1000 children**

Type of worms	Noof cases	Percentage
General incidence	282	28.2
Ascaris lumbricoides	192	19.2
Ancylostoma duodenale	34	3.4
Trichuris trichura	20	2.0
Hymenolepis nana	17	1.7
Oxyuris vermicularis	14	1.4
Tenia	3	0.3
Strongyloides stercoralis	2	0.2

**Table 2. The relative incidence of helminthiasis among 282 positive cases of the 1000 children**

Type of worm	No of cases	Percentage
Ascaris lumbricoides	192	68.08
Ankylostoma duodenale	34	12.05
Trichuris trichura	20	7.09
Hymenolepis nana	17	6.02
Oxyuris vermicularis	14	4.96
Tenia	03	1.06
Strongyloides stercoralis	02	0.70

To know the true incidence of oxyuris vermicularis, cellophane technique was employed. Out of 100 children, 28 (28%) showed the presence of oxyuris vermicularis ova.

**Table 3. Age incidence**

Age	Ascaris	Ankylostoma	Oxyuris Vermicularis
0-12 months	9(4.68%)	0	0
1-3 years	73(38.02%)	6(17.64%)	3(21.42%)
3-5 years	48(25%)	6(17.64%)	5(35.71%)
5-7 years	18(9.37%)	6(17.64%)	2(14.28%)
7-9 years	18(9.37%)	5(14.70%)	1(7.14%)
9-12 years	26(9.37%)	11(32.35%)	3(21.42%)
Total	192(100%)	34(100%)	14(100%)

Ascaris was commonly observed in the age group of 1-5 years (63%). The youngest child observed in this study was 5 months old. This is in contrast to hookworm which was more common after the age group of 5 years (65%), especially so in the age group of 9-12 years (32.44%). None of the children below one year had ankylostoma infestation.

**Table 4. Sex incidence:**

Age	Ascaris			Ankylostoma			Oxyuris		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
0-12 months	9	4	5	-	-	-	-	-	-
1-3 years	73	53	20	6	4	2	3	2	1
3-5 years	48	26	22	6	3	3	5	3	2
5-7 years	18	12	6	6	3	3	2	1	1
7-9 years	18	10	8	5	3	2	1	1	-
9-12 years	26	18	8	11	9	2	3	2	1
Total	192	123	69	34	22	12	14	9	5

Helminthic infestations were observed commonly in male children than in female children. Ascaris was noted in 123 males and 69 females, the ratio being 1.9:1. This male preponderance was observed in all the age groups. But, out of the 1000 patients studied, 580 were males of which 123 were infested (21.4%) and 420 were females of which 69 were infested (16.6%).

Ankylostomiasis was found in 22 males of the 580 male patients in 1000 children (3.9%) and 12 f the 420 females patients (2.85%) in 1000 children.

Of the 14 children infested with oxyuris, 9 were males and 5 were females.

### Mixed infestation

Of the 282 positive cases 49 had mixed infestation as follows

Table 5

Type	No of cases
Ascaris + Oxyuris	11
Ascaris + Hookworm	10
Ascaris+ T. Trichura	7
Ascaris + Giardia	5
Ascaris + E. histolytica	5
Ascaris + H. Nana	2
Hookworm + Oxyuris	2
Tenia + T. trichura + Oxyuris + H. Nana	2
Ascaris + Oxyuris + T.trichura	1
Ascaris + Ankylostoma + Giardia	1
Ascaris +T. trichura + H. Nana + Ankylostoma	1
Ascaris + Ankylostoma + T. trichura	2

*Ascaris lumbricoides* was found to be the commonest worm associated with other helminths. The frequently noted mixed infestations were ascaris with oxyuris and *Ascaris* with ankylostoma.

### Distribution in rural and urban groups

Table 6

Type	Rural	Urban	Total
<i>Ascaris lumbricoides</i>	31(19.18%)	161(80.82%)	192
Ankylostoma	29(85.3%)	5(14.7%)	34
<i>Oxyuris vermicularis</i>	4(28.57%)	10(71.42%)	14

## DISCUSSION

According to WHO, the level of helminth infection can be viewed as an index of a community's progress towards a desirable level of sanitation<sup>1</sup>Poor hygienic living conditions give rise to helminth infections in children, with the prevalence of such infections being an excellent indicator of socio-economic status.<sup>2</sup>

Intestinal parasites are transmitted through the contamination of water, soil, and food by feces, a direct consequence of poor hygienic and living conditions.<sup>3</sup>

WHO report says that one out of four persons in the world is suffering from one or the other worm infestation. The incidence observed in the present study goes with the reports given by W.H.O, Anita et al.<sup>1,4</sup> The widely variable incidence reported by many workers is due to many factors. The incidence varies with geographical conditions, socioeconomic status of the people, type of population involved in the study-rural or urban, general or hospital population, children or adults, method of stool examination, sanitary facility and civic sense of people in that locality.

The present study includes children of all ages in the hospital population; hence the incidence is low compared to the study by other workers who have conducted the survey in the general population.

### Spectrum of infestation

*Ascaris* was found to be the commonest worm (68.08%, 192/1000). This is in agreement with the reports given by other workers.<sup>4</sup>

Cellophane tape technique revealed a high incidence (28%) of the oxyuris vermicularis infestation in contrast to routine stool examination which showed only 1.4% positive.

It is significant to note that, here the incidence is high for *H. Nana* (1.7%) and *Trichuris trichura* (2%). Probably the high incidence is due to the use of concentration technique in all cases.

Mixed infestations were found in 49 cases (4.9%) as compared to 27.7% and 3.9% of Santhan Krishnan and Usha et al series respectively.<sup>5,6</sup> *Ascaris lumbricoides* was found to be the commonest associate and it was commonly accompanied with oxyuris vermicularis and ankylostoma. Vyas et al have also reported similar association.<sup>7</sup>

## AGE INCIDENCE

Seventy three children (38.02%) in the age group of 1-3 years and 48 children (25%) in the age group of 3-5 years had ascariasis, as compared to 9 cases (4.68%) in the age group of 0-12 months. The high incidence in preschool age is explained by the fact that, during this period, children have the curiosity of putting every thing into their mouth, as they are developing a hand to mouth phenomena, and mingle and play with other children in the outdoor yards where the soil could be contaminated with fecal droppings.

Ankylostomiasis was observed frequently in the age group of 9-12 years. In this study there was a significant increase in ankylostomiasis as the age advanced, but this is not so with oxyuris vermicularis. Pohowallah and Singh found a significant increase in oxyuris infestation as the age advanced.<sup>8</sup>

## SEX INCIDENCE

Helminthiasis has no particular predilection for the sex, except with the ankylostomiasis which is more common in males because of the nature of their work. But in the present study, all types of worm infestations had inclination towards the male sex, finding consistent with other studies.<sup>9</sup>

## Incidence in rural and urban population

161, 5 and 10 children from urban population and 31,29 and 4 children from rural population had ascariis, ankylostoma and oxyuris infestation respectively. This finding goes with the saying that, "Ascariasis is a disease of the urban and Ankylostoma is a disease of the rural area". Similar observation made by Usha Parekh et al and other studies suggests that this could be due to higher contamination of the soil and overcrowding in the urban areas.<sup>6</sup> This is in contrast to ankylostomiasis which is more common in the rural children, where people are in the habits of promiscuous defecation in the open fields and walk around barefooted.

## CONCLUSION

Among the helminthic diseases, Ascaris heads the list followed closely by ankylostomiasis.

Helminthiasis still continues to be a major public health problem in India and other developing countries. Unless there is improvement in the social and economic condition of the people, provision of safe drinking water, sanitary latrines, adequate nutritious diet, proper housing periodic deworming of children and health education, people in developing countries have to undergo the ill effects caused by these infestations for some more time to come.

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# Medical Auditing - A Study of Systematic Case Review in a Tertiary Care Hospital

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## ABSTRACT

Medical Audit of hospital records has been a major component of quality of care assessment<sup>1</sup>. The aim of the present Medical audit is to identify the areas for improvement and make necessary changes to provide a better quality medical care to the patients in tertiary care hospital like Nizam's Institute of Medical Sciences, India. The present study reveals that most of medical records were deficient in some or other information. The reasons for the insufficiency of medical records were explained by the doctors that the medical records were filled by naïve resident doctors and also due to heavy workload in areas like emergency department and critical care units preventing them from concentrating in filling the medical records.

**Keywords:** Health Care Quality Assurance; Medical Audit; Quality of Health Care; Medical Records

## INTRODUCTION

Clinical audit is defined as “a quality improvement process that seeks to improve patient care and outcomes through systematic review of care against explicit criteria and the implementation of change”. Principles for Best Practice in Clinical Audit’ (2002, NICE/CHI)<sup>2</sup>. The overarching aim of clinical audit is to improve service user outcomes by improving professional practice and the general quality of services delivered.

Medical audit of hospital records is mainly based on process of care<sup>3</sup>. Quality of care evaluation has been typically based on retrospective analysis of clinical records using either clearly stated criteria or judgment based on individual experience (medical audit). Measurement of quality of care requires that it be translated into more concrete representations that lend themselves to quantification. For the purposes of quality assessment, Donabedian (1980) defined these representations as the criteria and standards of structure, process, and outcome<sup>4</sup>. A major limitation of process-based assessment is the difficulty in designing standards of care. Efforts have been made to develop guidelines for physicians in decision making. However, written guidelines have not been able to cover the infinite variety of situations that may arise in clinical practice (Chassin, 1990; Kassirer, 1993)<sup>5,10</sup>. Scientific evidence of effectiveness of a specific procedure or intervention is often unavailable and hence, process assessment often relies solely on implicit criteria, i.e. on the judgment of an expert. However, physician agreement regarding

quality of care has been shown in several studies to be poor (Richardson, 1972; Goldman, 1992)<sup>6,7</sup>.

With increasing growth in medical tourism it has become imperative for the healthcare sector to provide best services possible and regularize audits to establish standards.

Nizam's Institute of Medical Sciences being a renowned super-specialty hospital, people expect a high quality of health care, which can be made possible by analyzing the process of providing care through regular medical audits. With this view a study was conducted to evaluate the quality of medical care provided through a retrospective method of medical auditing of medical records.

## AIM OF THE STUDY

The aim of the present study is to analyze the medical records to evaluate medical care in a tertiary hospital

## OBJECTIVES

1. To analyze the medical records and find out the deficiencies in the medical records.
2. To understand the reasons for the same.
3. To analyze the appropriateness of clinical services rendered to the patients.



## METHODOLOGY

A retrospective study was conducted on 100 Medical records from surgical departments, treated at Nizam's Institute of Medical Sciences. Descriptive statistics were used and findings were discussed with suitable explanations. A detailed questionnaire was prepared<sup>1</sup> and the data was collected from 100 randomly selected medical records from surgical departments. The inferences were derived after discussing with the treating Consultants and Residents. The questionnaire included was pertaining to medical records, diagnosis, treatment and length of hospital stay.

## OBSERVATIONS AND RESULTS

A thorough scrutiny was done based on the prepared questionnaire and the following results were observed.

The study showed that 88% of medical records were completely filled, with 78% of medical records having complete detailed documentation of history, examination and management, while only 66% of medical records were documented with laboratory

investigations and 27% of medical records do not contain progress note. Every medical record has a duplicate discharge summary attached (Table 1). The study revealed that 15% of cases lacked provision diagnosis before admission, and 18% of provisional diagnosis did not match with the final diagnosis. Final diagnosis goes in hand with 83% and 92% of cases ordered for laboratory and radiological findings respectively. 12% and 16% of cases were unnecessarily ordered for laboratory and radiological investigations respectively. 92% of cases had same post-operative diagnosis as pre-operative diagnosis (Table 2). Only 61% of medical records had documented operation notes and 81% of medical records had documented anesthesia notes (Table 3). 8% of medical records missed patient's consent form. 96% of medical records showed proper indication for surgery (Table 3). Increased length of stay is observed in 39% of cases because 15% of cases had pre-operative delay, 11% of cases had delay in performing specific or definitive investigations and 9% of cases had delay in arriving at a final diagnosis (Table 4).

**Table-1: Findings Pertaining to Medical Records**

S.No	Questionnaire pertaining to Medical Records	Yes	No
1	Were all records filled properly in the medical records?	88	12
2	Were details pertaining to patient's clinical evaluation like detailed history, clinical examination, diagnosis and management documented?	78	22
3	Were all the laboratory and radiological investigations ordered attached to the medical record?	68	32
4	Were all the laboratory and radiological investigations done documented in the medical record at appropriate place?	66	34
5	Were the progress notes documented sufficient and relevant to the clinical condition of the patient?	73	27
6	Was proper and complete discharge summary attached at the time of discharge of patient?	100	0

**Table-2: Findings Regarding Diagnosis and Investigations**

S.NO	Questionnaire regarding Diagnosis and Investigations	Yes	No
1	Whether a provisional diagnosis was made before admission?	85	15
2	Whether a final diagnosis was made before discharge?	100	0
3	Does the provisional diagnosis made tallies with the final diagnosis?	82	18
4	Do the laboratory findings correlate with final diagnosis?	83	17
5	Do the radiological findings correlate with final diagnosis?	92	8
6	Were the laboratory investigations sufficient in relation to the final diagnosis?	89	11
7	Were any radiological investigations indicated in relation to the final diagnosis, but not ordered?	6	94
8	Was any laboratory investigation ordered unnecessarily?	12	88
9	Was any radiological investigation ordered unnecessarily?	16	84
10	Whether the Pre-operative diagnosis tallies with the Post-operative diagnosis?	92	8

**Table-3: Findings Pertaining to Treatment and Surgical Procedures**

S.No	Questionnaire pertaining to Treatment	Yes	No
1	Were the operation notes adequate?	61	39
2	Were the anesthesia notes adequate?	81	19
3	If the cases required other specialist consultations, were they referred?	83	17
4	Were the associated signs and symptoms addressed properly?	86	14
5	Was pre-operative consent obtained from patients or patients attenders?	92	8
6	Was pre-operative anesthetic assessment done and documented?	95	5
7	Was the surgery done indicated for the patient?	96	4
8	Was any normal tissue removed during the surgery?	0	100
9	If yes, was it justified?	NA	NA

**Table-4: Findings Pertaining Length of Patient Stay in Hospital**

S.No.	Questionnaire pertaining Length of patient stay in hospital	Yes	No
1	Was there any inordinate delay between admission and surgical procedure?	15	85
2	Was there any inordinate delay for specific / definitive investigation?	11	89
3	Was there any inordinate delay between admission and ordered investigations?	9	91
4	Was there any inordinate delay in arriving at a final diagnosis?	9	91
5	Was the length of patient stay longer than needed for the procedure?	39	61
6	Did the patient recover from the chief complaints at the time of discharge?	100	0

## DISCUSSION

Based on the questionnaire and results obtained along with discussion of various treating doctors and faculty, the study showed a serious indication to set a system of medical audit in a tertiary care hospital.

Many medical records were deficient in some or other information that need to be documented. Few medical records missed routine case taking findings, while few did not have progress notes and some medical records lacked documentation of investigations ordered. When surveyed regarding the missing information in medical records, senior doctors gave few reasons. Firstly, in a tertiary care hospital like Nizam's Institute of Medical Sciences, many a times medical records are filled by the resident who are inexperienced, who either lack knowledge of proper filling or ignore the importance of filling of medical records. Second, due to heavy workload and tight schedules of doctors especially in areas like emergency departments, critical care units, etc filling and cross verification of medical records is often missed. Third, lack of attached documentation of investigation is mainly because of miscommunication among doctors, nurse and ward workers.

Medical records with missing provisional diagnosis or mismatch with the final diagnosis can be due to the inexperience of the resident doctors. Disparity between pre-operative and postoperative diagnosis can be due to lack of few indicated investigations or because of limits in clinical examination and investigations. Few

cases can be diagnosed properly or completely only on the operating table.

Mismatch between findings of investigations ordered and final diagnosis was explained as the main purpose of investigation was either to support or disprove diagnosis and moreover few investigations were ordered to rule out differential diagnosis or co-morbidities. In few cases the mismatch can be explained by the validity theory, as every investigation can have true positives and true negatives. The reasons for insufficiency of investigations in few cases were explained as either the investigation indicated was not available in the hospital or the case was diagnosed prior based on sign and symptoms and prior ordered investigations. The unnecessary order for investigations can be because of over-enthusiasm or lack of proper guidelines for particular diseases. Few cases had extra investigations, as these were medico-legal cases which needed a list of investigations as per protocol, whereas in others it was ordered to rule out differential diagnosis to arrive at a final diagnosis or evaluate associated risks of co-morbidity on anesthetic and surgical procedures.

Lack of proper operation notes and anesthesia notes can also be explained as, many a times these notes are dictated by the seniors, but residents document it later. Lack of consent in few medical records, one of the most important observations from the point of legal aspects of medicine, was explained as patients were brought unconscious to the hospital by unrelated persons who can't or refused to give the consent, example like road traffic accidents, and in view of emergency patient was

treated without waiting for the consent. Lack of pre-operative anesthetic check-up can also be explained by the same.

Few cases showed improper indication of surgery as they require exploration on operation tables, example of diagnostic laprotomy, which few times can turnout as non-indication. Few cases required other specialist's opinion but weren't referred as the treating doctor was confident enough to manage the case.

An inherent limitation of most studies of quality assessment is their reliance on medical records. The problems with this source of data are well recognized: reports may conceal rather than disclose substandard care; evidences of quality problems provided are usually incomplete and inconclusive of substandard care; medical record review is labor-intensive and expensive<sup>8</sup>. Despite its drawbacks, the medical record is the best single source of data for quality assessment, and probably the most frequently used for this purpose because of its comprehensiveness and ease of access<sup>9</sup>.<sup>11</sup>. Medical-record-based assessment of quality of health care by physicians has been accepted for its face validity, since reference criteria are usually unattainable or controversial. Reliability of medical audit of hospital charts should be pursued by (1) improving upon current structured review instruments, (2) applying explicit criteria preferentially based on practice guidelines, (3) combining reviews of several reviewers, and (4) using outcome-oriented criteria<sup>12</sup>.

### CONCLUSION

Medical audit not only serves as a tool for quality assurance for a hospital, but also helps the doctors in improvising their knowledge by pointing out the loopholes, giving an opportunity to correct the faults or mistakes done earlier. Medical audit also helps in maintaining records and practicing medicine in evidence based method, supporting the doctors legally, as not to forget medical services are included in Consumer Protection act in 1995. The entire faculty in a hospital should help in making guidelines and protocols in regards to medical record filling and maintenance. It is recommended that all the standards set should be in written form, reviewed periodically and changes should be made to set up higher standards.

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# A Study of Biochemical Changes in Occupational Exposure of Portland Cement among Construction Workers in Ujjain, Madhya Pradesh

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## ABSTRACT

Cement used in building and various construction works is a complex mixture of several metal oxides, silicates and miscellaneous compounds. In India, laborers involved in construction work are constantly exposed to the cement various ways. Biochemical effects of the occupational exposure in 31 workers were assessed by Aspartate transaminase, Alanine transaminase, Calcium, Magnesium, Maolondialdehyde and Ascorbate levels in serum. It was found that serum ALT, AST and calcium levels were elevated as compared to the controls. The Dirties ratio was significantly higher in the workers. The lipid peroxidation index was higher while ascorbate level was significantly lower in the cases. It is concluded that the construction worker show marginal alteration in liver functions which is secondary to oxidative stress generated by complex interaction of toxic cement compounds.

**Keywords:** Cement, Alanine transaminase, Aspartate transaminase, Calcium Magnesium, Maolondialdehyde and Ascorbic acid

## INTRODUCTION

Various grades and brands of cement are used for building constructions in India. Construction workers are daily exposed to Portland cement in variety ways. Chemically cement is a mixture composed of silicon dioxide, aluminum oxide, calcium oxide, magnesium oxide, ferric oxide, sulphur trioxide, tricalcium silicates tricalcium aluminate, shale, clay and other impurities. Laborers are constantly exposed to cement dust and concrete particles. The components of cement can enter through skin contact, inhalation and ingestion through drinking water, food and nail biting. Thus entry of cement in the body is mainly via respiratory system and gastro intestinal tract.<sup>1</sup>

Chronic exposure to cement dust may cause impaired lung functions and disorders of lungs such as bronchial asthma, emphysema, laryngeal cancer, dermatitis, boils<sup>1,2</sup> stomachache, liver, spleen, blood or gastro-intestinal tumor.<sup>3,4</sup> These disorders are associated with the provocation of an inflammatory response and triggers extensive host defense.<sup>5,6,7,8</sup> Inflammatory reactions also result in the secretion of cytokines, eicosanoides, lytic enzymes and chemotactic factors such as reactive oxygen metabolites.<sup>6,7</sup> The mechanism for these effects is not fully understood. Normally there is balance between free radical generation and antioxidant defense in the aerobic cell. Excessive generation of free radicals or decreased antioxidant defense creates oxidative stress which plays an important role in progression of patho-physiological changes in tissues.<sup>4,9,10</sup>

Sparse studies are available on liver toxicity in cement exposure and clear cause- effect relationship of cement dust on health hazards is unknown. Present study was designed to investigate the oxidant-antioxidant balance, aspartate aminotransferase (AST) and alanine aminotransferase (ALT) as indicators of

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liver function, serum calcium and magnesium, as components of cement, in construction workers.

### MATERIAL AND METHOD

Thirty one non-smoker, non-alcoholic, volunteer male building construction workers were selected as the study subjects. These study subjects were in age range between 20 – 50 years and were in the job for more than 5 years. Twenty seven healthy, non-smokers, non-alcoholic males served as the controls. These controls were in the same age range and were from the same area as the workers. All of these control subjects were in the indoor profession other than construction work. Written informed consent was obtained from all the subjects before recruitment. 10 ml of venous blood sample was collected from all the subjects following an overnight fast. Blood was allowed to clot for 30 minutes without hemolysis and serum was separated immediately after centrifuging at 4000 rpm for 15 minutes. Serum AST and ALT activities and concentration of ascorbic acid were measured immediately and rest of the serum was stored at 2-8 °C and used for the estimation of malondialdehyde (MDA), calcium, and magnesium within a week.

Serum AST and ALT assays were carried out according to the colorimetric end-point method of Reitman and Franke.<sup>11</sup> The De Ritis index (ALT to AST ratio) was calculated by using individual values of ALT and AST. Serum ascorbic acid concentration was measured by colorimetric method.<sup>12</sup> Ascorbic acid reduces phospho-tungstic acid in an acid medium to blue colored phospho-tungstus acid which has an absorption maximum at 700 nm. Serum calcium and magnesium levels were determined by dye-biding methods using cresolphthalein complexon and titan yellow respectively.<sup>13</sup> Free radical activity was assessed by the assay of serum MDA level. The assay procedure.<sup>14</sup> was used with minor modifications. The method is based on the reaction of MDA with thiobarbituric acid forming pink colored MDA-TBA adduct. Statistical analysis were done using student-t test for comparison of groups and values were processed as mean and standard deviation (SD). P values <0.001 were considered as statistically significant.

### RESULTS

The mean values of the biochemical parameters determined in both the controls and the study groups are shown in the table. The results indicate higher mean values of serum MDA and ALT. Serum calcium was

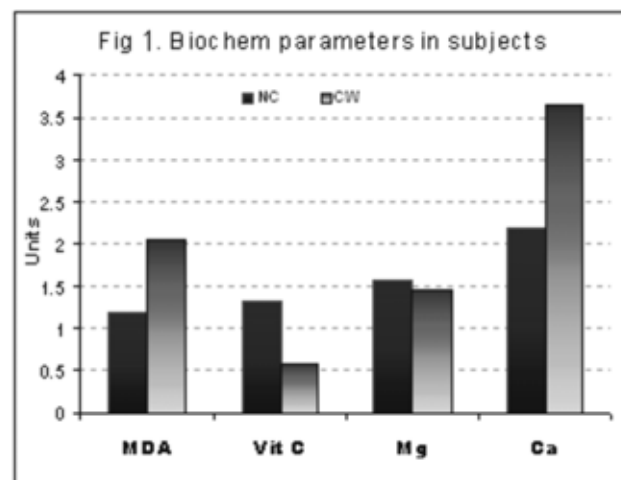
insignificantly high in the construction workers. Serum ascorbate level was lower when compared to the control group and serum magnesium level was not different from the controls.

**Table 1: Biochemical variable in the subjects.**

Biochemical parameter	Controls (n 27)	Workers (n 31)	t	P
Serum AST (IU/L)	17.29 ± 5.62	21.63 ± 4.39	3.242	<0.05
Serum ALT (IU/L)	20.07 ± 4.98	44.12 ± 5.4	17.63	<0.001
de ritis ratio	1.18 ± 0.53	2.06 ± 0.48	6.589	<0.001
Serum Ca (mg/dl)	9.18 ± 1.38	10.03 ± 1.28	2.42	<0.05
Serum Mg (mg/dl)	1.56 ± 0.10	1.45 ± 0.16	3.164	<0.05
Serum MDA (fmol/L)	3.28 ± 1.2	6.74 ± 1.48	9.788	<0.001
Serum Ascorbate (mg/dl)	1.32 ± 0.08	0.58 ± 0.15	23.78	<0.001

### DISCUSSION

Chronic exposure to cement dust has been reported to cause several health problems.<sup>1</sup> Cement components such as oxides of alkali and other metals such as silicon, aluminum, iron and other toxic impurities may cause obstructive air-way diseases such as asthma, chronic obstructive pulmonary disorders which are sometimes associated with chronic cough.<sup>1,2</sup> Published studies demonstrate the effects of cement dust on cellular dysfunctions, phagocytic activity and impaired defense mechanism.<sup>3,4,6</sup> High concentration and/or prolonged inhalation of cement dust can provoke clinical symptoms. Exact mechanisms of the adverse effects of occupational cement dust exposure are unclear.



Many studies have shown that cement dust may enter into systemic circulation and thereby reach different tissues including liver.<sup>1</sup> The cement components may cause diffuse swelling and proliferation of sinusoidal lining of cells. The toxic cement components may induce inflammatory

reactions. This can lead to phagocytosis by polymorphonuclear lymphocytes and macrophages. During phagocytosis, the respiratory burst generate reactive oxygen metabolites like superoxide radicals.<sup>3,6</sup> Free radicals are well known to have number of deleterious effects such as increased membrane rigidity, osmotic fragility, modification of cellular components and alteration of membrane structure and function.

Findings of the present study that serum MDA, a stable end product of lipid peroxidation and marker of free radical activity, was much higher in the construction workers indicate excessive free radical generation. It is reported that MDA and antioxidant enzymes are the biomarkers in subjects exposed to mineral dust.<sup>6,8,15</sup> Several studies reported that cement plant workers exposed to cement dust show higher levels of serum MDA.<sup>3,6,9,15,16</sup>

Imbalance between free radical formation and antioxidant defense causes increased lipid peroxidation in hepatocytes. Lowered antioxidant status is indicated by decreased serum ascorbic acid levels in the construction workers. Ascorbic acid is a primary, water soluble antioxidant which works with the enzymatic and non-enzymatic antioxidants.<sup>17</sup> Thus exposure to cement leads to greater oxidative stress that plays an important role in peroxidation of cellular membrane of the hepatocytes.<sup>18</sup> This effect may result in leakage of AST and ALT. Raised levels of transaminases and *De Ritis* ratio in the cement workers. Such elevation found in the cases suggests altered function of liver. The elevation of *De Ritis* ratio specifically reflects hepatotoxicity.

Serum calcium and magnesium levels were not significantly different in the workers and indicate normal homeostasis of non-toxic elements despite clinical symptoms due to prolonged inhalation. Thus functional capacity of liver must have impaired in the construction workers, still they appear clinically healthy. These biochemical parameters may serve as an early indicator of preclinical hepatotoxicity in occupational exposure of Portland cement.

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# Ocular Trauma- Spectrum of Ultrasound Findings: A Prospective Study

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## ABSTRACT

**Introduction:** Ocular trauma is a common co-existing injury, often missed, in poly-trauma. Delayed diagnosis may lead to vision threatening consequences. It is important to diagnose it early so as to prevent ocular morbidity.

**Patients and Methods:** A prospective observation study comprising 50 patients with positive Ultrasound findings referred to our department and having history of ocular trauma. Ocular Ultrasound was done and various findings were recorded and analysed.

**Aims and Objectives:** To study the spectrum of ultrasound findings in ocular trauma and to advocate the liberal use of Ultrasound in this clinical setting.

**Observations and Results:** The age of the patients in the sample ranged from 8-63 years with mean age being 26 years. The commonest pathologies to be encountered were vitreous haemorrhage and anterior chamber abnormalities. Foreign body detection and retinal detachment followed thereafter. Other abnormalities of globe, lens, retinal detachment and choroid detachment were also observed and analysed.

**Conclusion:** In our study, the higher percentage of major ophthalmologic findings like vitreous haemorrhage and anterior chamber abnormalities appear to be due to the fact mainly those patients, in whom clinical examination was not possible, were referred for ocular Ultrasound examination. These included ones in whom eyelids were either swollen or had open injuries, and also in whom posterior chamber was inadequately visualized due to anterior chamber rendered opaque by injury.

The study showed that ultrasound is an excellent modality to diagnose extent and nature of ocular trauma. Thus we propose liberal use of ocular ultrasound in an emergency setting of ocular trauma.

**Keywords:** Ocular trauma, Ultrasound, Poly trauma.

## INTRODUCTION

Ocular trauma is common and may lead to vision threatening consequences. The cumulative lifetime prevalence of ocular trauma have been estimated to be 19.8%. Trauma to one and both eyes was reported in 85 % and 15 % of the prevalent cases respectively<sup>1</sup>. It has been estimated that ocular trauma leads to blindness in 11.4% of cases<sup>2</sup>. Approximately half of all the patients

presenting to an eye casualty department complain of ocular trauma due to various causes<sup>3</sup>.

Ocular traumas are usually associated with other injuries, like head and neck or limbs, and its definitive diagnosis in an acute setting may be challenging. This problem is often missed, especially in polytrauma patients, which may lead to serious morbidity later on in life. Thus proper diagnosis is mandatory in high suspicion cases, which necessitates the need of employment of appropriate imaging techniques, for accurately defining the extent and type of ocular injury.

Various imaging modalities exist to aid in the initial and subsequent evaluation of trauma involving the eye and orbit. Clinically, the best modality for the initial

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evaluation of eye trauma remains indirect ophthalmoscopy. When refractive media is opaque or the eyelids are swollen, indirect ophthalmoscopy cannot be reliably performed. Ultrasound is very helpful in this clinical setting and has emerged as a useful and quick technique for detecting the extent and nature of ocular trauma regardless of intervening opacities and has revolutionized the management of the traumatized eye. The aim of this study is to establish the importance and significance of ocular ultrasound as a preliminary investigation of ocular trauma. Also, the need of facility of ocular ultrasound in the hands of a competent Radiologist, in a hospital catering to trauma, cannot be overemphasized.

### PATIENTS AND METHOD

This study was undertaken in the Radiology department of School of Medical Sciences and Research, Sharda University from August 2011 to August 2012, after taking permission from institutional ethical committee. During this period, 71 patients of suspected cases of ocular trauma were referred for ultrasound, out of which 50 had positive radiological findings. All the 50 patients were included in this study. There were no exclusion criteria. They were random patients with no categorization of age or gender. No informed consent was required from the patients due to the non-invasive nature of ultrasound. We analysed the type of injury encountered in all 50 patients with history of ocular trauma that were referred by the ophthalmologist for ultrasound of traumatized eye.

Real time ocular Ultrasound was performed using Logiq 5 Pro GE Ultrasound scanner. Standard closed eye technique with Linear probe of frequency 10 MHz was used. The probe was cleaned properly before each scan and also sterile rubber sleeve was used in cases of open palpebral wounds. Proforma was filled for each patient and data regarding Globe (regular/ irregular), Anterior chamber depth (commented upon after comparison with contralateral eye), lens (position and echogenicity), Vitreous (Clear or hemorrhage), Retina and Choroid, and intraocular foreign body was recorded and thereafter analysed.

### OBSERVATIONS AND RESULTS

Of the patients examined, 16 (32%) gave history of blunt trauma and remaining 34 (68%) presented with penetrating trauma. In this study, there were 8 (16%) female patients and 42 (84%) males. The age ranged between 8-63 years. The mean age of patients in our study was 26 years. The various pathologies identified were tabulated (Table 1).

**Table-1**

Pathology	Male	Female	Total patients	Percentage
Globe rupture	12	2	14	28%
Anterior Chamber shallow/deep/hyphema	20	8	28	56%
Lens (displaced/cataractous)	14	2	16	32%
Vitreous Haemorrhage	24	8	32	64%
Retinal detachment	18	2	20	40%
Choroid detachment	8	0	8	16%
Foreign body	20	4	24	48%

It was thus observed that the commonest pathologies to be encountered were vitreous haemorrhage(64%) and anterior chamber abnormalities (56%) including hyphema.

Foreign body detection (48%) and retinal detachment(40%) followed thereafter.

### DISCUSSION

Traumatic ocular emergencies can present in isolation or as a part of polytrauma. It is difficult to perform a physical examination on a severely injured patient. The eye may be swollen or there may be corneal edema, intraocular bleeding such as hyphema rendering fundoscopic examination impossible. The patient may be unable to cooperate or respond, making it difficult to evaluate for visual acuity or ocular movement. Since these lesions can lead to morbidity in the form of vision loss, they warrant a high index of suspicion and prompt and judicious use of imaging modalities to obtain an accurate diagnosis and initiate appropriate management at an early stage.

In our study, vitreous haemorrhage(64%) and anterior chamber abnormalities including hyphema(56%) were most frequently observed. This is due to the fact that when the anterior chamber has haemorrhage, it is rendered opaque and thus funduscopy examination is not possible. This is the ideal clinical setting where ultrasound is vital to visualize the lens and posterior chamber<sup>4,5</sup>.

Vitreous haemorrhage or blood in the posterior vitreous chamber includes mild acute bleeding, abundant hemorrhage, healing absorption and clot reduction. On ocular ultrasound, based on severity it is seen as increased vitreous echogenicity to freely mobile low level echoes. Acute dispersed vitreous haemorrhage may be minimally echogenic. In subacute and chronic haemorrhages the vitreous may be filled with echoes or have thin membranes (Figure 1).

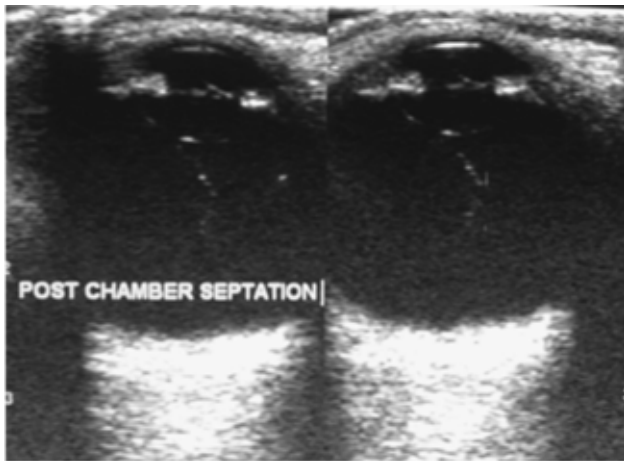


Fig. 1. Ocular ultrasound image shows thin septations in the vitreous suggesting vitreous haemorrhage.

In our study, anterior chamber abnormalities included shallow or occasionally deep anterior chamber determined on comparison with the non traumatized eye. Shallow anterior chamber is due to injury to the ciliary body or corneal rupture (Figure 2). In four of the patients in our study, the anterior chamber was found to be deep along with globe irregularity. Out of those 4 patients, when preoperative data was analysed it was found out that two had scleral rupture posterior to the attachment of ciliary body and two had lens dislocation (Figure 3). Blunt trauma can lead to posterior scleral rupture that may be difficult to detect clinically and with ultrasound. However, such a rupture should be suspected when such indirect signs exist<sup>6</sup>.

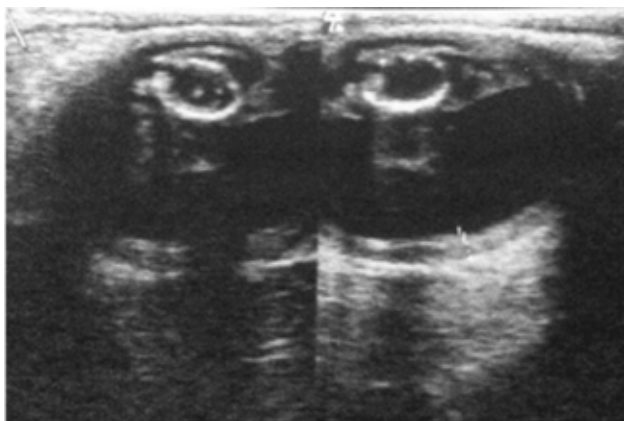


Fig. 2. Ultrasound image showing collapsed anterior chamber due to corneal perforation. Cataractous lens is also seen.

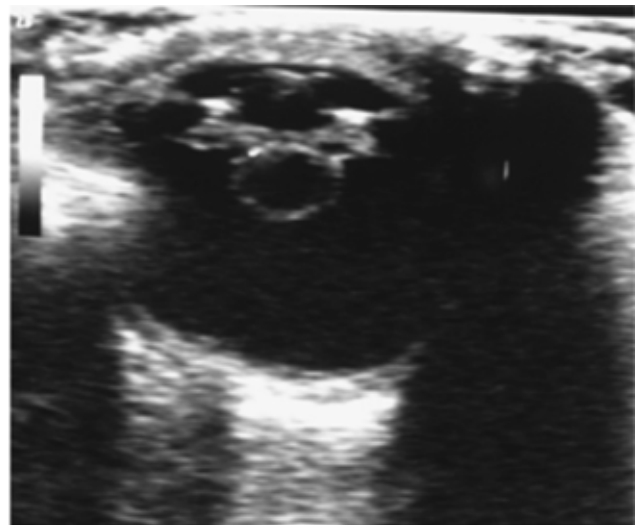


Fig. 3. Ocular Ultrasound showing posteriorly displaced cataractous lens causing deep anterior chamber

Hyphema or blood in the anterior chamber is due to disruption of iris or ciliary body blood vessels. It is seen as floating echoes or sometimes a fluid-debris level (Figure 4). We also identified foreign body in as many as 48% cases. The examination of the globe is exhaustive and patient is asked to perform ocular movements to find the exact ultrasound incidence angle to visualize the foreign body. Ultrasound is thus useful in detecting small, non-metallic posteriorly located foreign bodies that may not be detected by other methods<sup>7</sup>. A study by Khan et al stated that ultrasound is an excellent method to detect all kinds of intraocular foreign bodies with an overall detection rate reaching 93 %<sup>8</sup>.



Fig. 4. Traumatic anterior synechiae formation on temporal side

Foreign bodies in the globe are echogenic and may be associated with a comet tail artefact. In penetrating trauma, a hemorrhagic track can be identified from the point of entry (Figure 5). We identified as many as 40% cases with retinal detachment and 16% with choroid detachment. This was due to the excellent spatial resolution of ultrasound. It is by far the best technique to demonstrate retinal and choroid detachments and their exact extent. The detached retina appears as a highly echogenic line, fixed at papilla and ora serrata. The retina can be detached in the localized area or totally detached, V shaped with apex at optic disc(Figure 6).



Fig. 5. Ultrasound image showing an echogenic foreign body in anterior chamber with cataractous lens



Fig. 6. Ultrasound image showing V-shaped total retinal detachment

Choroid detachment extends from ora serrata to optic disc, but fixed by vortex veins to sclera. On ultrasound it is seen as two thick convex lines from ciliary body to point on both sides of papilla, hardly mobile. Retinal detachment and choroidal detachment move with eyeball but the movement stops as soon as the eyeball movement stops

If haemorrhage and clot formation occurs in the suprachoroidal or subretinal spaces, serial ultrasound examinations are useful to monitor the clot for dissolution or even for drainage procedures if clinically indicated<sup>9</sup>. In a study done by Imran S et al, they found that ultrasound was superior to Computed Tomography in diagnosing retinal detachment and choroid detachment<sup>10,11</sup>.

Abnormalities of the lens including subluxation/dislocation and cataract were found in 32% cases in our study. In complete dislocation the lens lies in the dependent region of vitreous. It can even be not seen at all in the globe, termed as ectopia lentis. In cases of subluxation, one margin of lens remains behind iris, rest is angled into vitreous and may be seen moving (Figure 7).

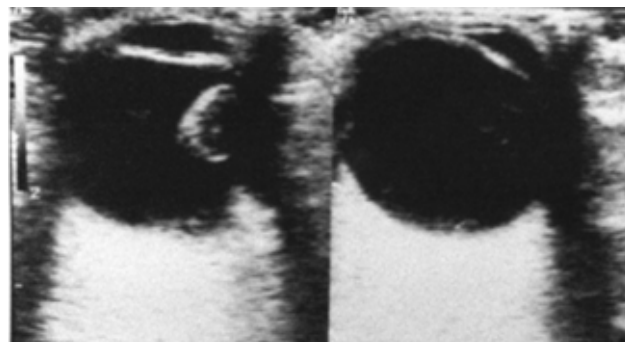


Fig. 7. Detached cataractous lens is seen hanging in posterior chamber

Blunt trauma is responsible for coup and contrecoup ocular injury. Coup is the mechanism of direct impact. Contrecoup refers to distant injury caused by shockwaves traveling along the line of concussion. When the anterior surface of the eye is struck bluntly, there is a rapid anterior-posterior shortening accompanied by equatorial expansion. This equatorial stretching can disrupt the lens capsule, zonules, or both. Combination of coup, contrecoup, and equatorial expansion is responsible for formation of traumatic cataract following blunt ocular injury<sup>12</sup>.

Penetrating trauma that directly compromises the lens capsule leads to cortical opacification at the site of injury. If the rent is sufficiently large, the entire lens rapidly opacifies, but when small, cortical cataract can seal itself off and remain localized.

Thus lens can become cataractous at a variable time post injury (ranging from immediately to few days). On ultrasound, cataractous lens either has Intralenticular echoes or increased thickness and echogenicity of walls of lens.

In our study, the higher percentage of major ophthalmologic findings like vitreous haemorrhage appears to be due to the fact that mainly those patients, in whom clinical examination was not possible, were referred for ocular ultrasound examination. These included ones whose eyelids were either swollen or had open injuries, and also in whom posterior chamber was inadequately visualized due to anterior chamber rendered opaque by injury.

Nevertheless, Ultrasound provides excellent images of eye and in the hands of an experienced Radiologist can provide reliable and detailed information about the ocular structures. Ophthalmic Ultrasound has several practical advantages than more expensive modalities like Computed Tomography and Magnetic Resonance Imaging. The equipment is easily transportable when necessary, making it one of the most efficient and rapid means of diagnostic imaging in ocular trauma in many different settings.

### CONCLUSION

The facility of Ultrasound is now easily available and also it is cost effective and non ionising. This study shows that ultrasound is an excellent modality to diagnose extent and nature of ocular trauma. Keeping in view of its high accuracy in detecting ocular traumatic pathologies, we strongly recommend that ultrasound can be advised as first line of investigation in the emergency setting of ocular trauma.

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# Estimation of Life Expectancy at Birth for the Smaller North Eastern States of India (2001-2005)

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## ABSTRACT

**Objective:** In this paper, it is an attempt to estimate the life expectancy at birth for the smaller north eastern states of India for 2001-05.

**Materials and Methods:** Regression technique is used to estimate the life expectancy at birth, which requires only two data elements: the crude death rate and the proportion of the population aged 65 years and above. The regression model underlying the life expectancy estimates is constructed by using state level data for 16 bigger states of India.

**Result:** The result indicates that the life expectancy at birth for males (females) varies from 57.03(58.09) for Meghalaya to the maximum of 68.92(71.12) for Manipur.

**Conclusion:** Majority of the smaller north eastern states of India have recorded a higher life expectancy at birth compared to the national average. Interestingly state situated far away from the mainstream of the country shows better life expectancies.

**Keywords:** Life Expectancy at Birth, Regression.

## INTRODUCTION

No element of human welfare is as highly valued as length of life itself in the optimal state of health. Life expectancy at birth is considered as an important indicator to describe the level of mortality in a population. It is an excellent indicator for comparing the mortality of two or more populations and also used in calculating human development index. Life expectancy at birth, perhaps the most often cited summary indicator of population health, is calculated by applying the registered number of deaths and age wise population<sup>1</sup>. However, in small subpopulations where absolute number of registered death is not sufficient, it is difficult to estimate the life expectancies from the available age-specific mortality data. In such a situation, the investigation into the mortality experience may be made through some indirect demographic techniques.

Over the years a number of indirect techniques have been suggested to estimate the life expectancy at birth by many demographers. For instance, Mazur (1972)<sup>2</sup> developed a relationship of life expectancy at birth and some demographic variables and exploited it to estimate the life expectancy at birth. In the United States, Mazur's approach was tested and refined by Swanson and Palmore (1976)<sup>3</sup>, Swanson, Palmore and Sundarum (1977)<sup>4</sup>, Gunasekaran, Palmore and Gardner (1981)<sup>5</sup>. In 1989 Swanson<sup>6</sup> constructed a regression model for estimating life expectancy using state-level data and tested the estimates in a nationwide sample of metropolitan areas, cities, their suburbs, and rural counties in Ohio, USA. The regression equation that exploits the relationship between the life expectancy at birth and certain other demographic indices can be effectively used for estimating life expectancy at birth<sup>6</sup>. Perhaps, the regression method is the most suitable method to estimate the life expectancy at birth at the sub national level in India<sup>7</sup>.

In India, like the other developing countries, the vital registration system is not satisfactory, at least for the smaller states. Due to the poor civil registration data, the usual way of estimating life expectancy at birth from the age specific deaths cannot be adopted<sup>8,9</sup>. Though organisation like Sample Registration System periodically publishes the life expectancy at birth for

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bigger states but for smaller states no such figures are available. Due to the above constraints the regression method may be a suitable option for estimating the life expectancy at birth for smaller states of India.

The North Eastern part of India is one of the most ethnically and linguistically diverse regions located in the north eastern corner of India and occupies distinctive place due to its socio- cultural features. It lies, geographically between 22° and 29° North latitude, and 89°. 46' and 97°.5' East longitude and covers an area of 26,2179 sq.km. The region is in a strategically vulnerable geographical situation and surrounded by countries like Bhutan, China, and Myanmar on the east and Bangladesh on the north- south. Topographically, the region is a mixture of hills and plains, with wide bio-diversities, and varied climatic conditions. Politically, the region comprises currently of eight states; Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura. The society of Meghalaya is matrilineal in character, which distinguishes them from other societies of the region. However, the geography, history and tradition, have made the whole region to be considered as a single entity. People of this region have different religion with majority of Hindus followed by Muslim and Christian. Christianity is the dominant religion in two states viz., Mizoram (85.73%) and Nagaland (87.47%). The region has a high concentration of tribal population. The state of Arunachal Pradesh, Meghalaya, Mizoram and Nagaland are mostly inhabited by a number of native tribes. The entire land is a mixture of disparate races, civilizations, culture and languages. The main languages spoken by the people of this region are Assamese, Bengali, Manipuri, Khasi, Mizo, Nepali, English etc. Though the North Eastern states are economically not advanced as compared to the rest of the country, the region has enjoyed healthy literacy rate with Mizoram occupying second place in national ranking.

**OBJECTIVE**

In this paper an attempt has been made

- To estimate life expectancy at birth for the states of Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura for the period 2001-05 by regression technique proposed by Swanson (1989).

**MATERIALS AND METHOD**

As stated earlier the regression method is used to estimate the life expectancy at birth, which requires only two data elements: the crude death rate (CDR) and the proportion of the population aged 65 years and above [P(65+)]. The regression model underlying the life expectancy estimates is obtained by using state level data for 16 bigger states of India (2001-05). The life expectancy at birth ( $e^0_0$ ) figures are taken from Sample Registration System (SRS) based Abridged Life Table 2001-05, India<sup>10</sup>. The crude death rates (CDR) are the five year average value computed from SRS Bulletin for the period 2001 to 2005<sup>11</sup>. The percentage of population aged 65 years and above [P(65+)] is obtained from population census of India (2001)<sup>12</sup> and adjusted for the year 2003. The SRS based estimates are accepted by organization like the World Health Organization (WHO) as reliable estimates of birth rate, death rate and other fertility and mortality indicators at the national and sub-national levels.

As the percentage of population aged 65 years and above increases exponentially as a function of relative mortality, the relationship of P(65+) with is approximately logarithmic (Swanson et al 1977)<sup>4</sup>. In deriving the estimates, it is found that CDR and ln[p(65+)] are highly correlated with (Table 1.1). Accordingly two linear regression equations (males and females) have been attempted by taking life expectancy at birth as dependent variable and CDR and ln[P(65+)] as independent variable. As it is observed from the data that there is no strong relationship between CDR and ln[P(65+)] (Table 1.1), the model is assume to be free from multicollinearity<sup>13</sup>.

**Table 1.1. Correlation between  $e^0_0$ , CDR and ln[P(65+)].**

	$e^0_0$	P(65+)	CDR
$e^0_0$	1	0.814	-0.829
ln[P(65+)]	0.814	1	-0.587
CDR	-0.829	-0.587	1

The regression equations for estimating life expectancy at birth are

$$e^0_0 \text{ (Male)} = b_0 + b_1*(CDR)_{\text{Male}} + b_2*\ln[p(65+)]_{\text{Male}} \dots (1)$$

$$\text{(Female)} = b_0 + b_1*(CDR)_{\text{Female}} + b_2*\ln[p(65+)]_{\text{Female}} \dots (2)$$

Where 'b<sub>0</sub>' 'b<sub>1</sub>' and 'b<sub>2</sub>' are the regression coefficients.

**OBJERVATION AND RESULTS:**

**Table 1.2. Characteristics of the regression model for estimating  $e_0^0$ .**

Variable	Regression coefficient	
	Male	Female
Constant	62.829	63.286
CDR	-2.198	-2.329
ln[p(65+)]	11.783	10.637
R2	0.920	0.911

The estimates of life expectancy at birth for the smaller north eastern states of India is based on the following regression equations

$$e_0^0 \text{ (Male)} = 62.829 - 2.198 \cdot \text{CDR} + 11.783 \cdot \ln[P(65+)], R^2 = 0.920, \dots(3)$$

$$\text{(Female)} = 63.286 - 2.329 \cdot \text{CDR} + 10.637 \cdot \ln[P(65+)], R^2 = 0.911, \dots(4)$$

The model shows a strong linear fit with  $R^2$  value 0.920 (0.911) for male (female) (Table 1.2). This means 92% (91%) of the variance has been accounted for in our model. Therefore, we can assume that our data set is sufficient for creating a regression model for estimating life expectancy at birth for the states of India. Comparing the estimated for the bigger states of India (Table 2) with the SRS 2001-05 values we found that the mean error is 0.02(0.03) years and the mean absolute error is 0.81(1.22) years for male (female). Further nine (seven) values are overestimated and seven (nine) values are underestimated for male (female).

**Table 2. Estimated Life Expectancy at Birth Males (Females) 2001-05.**

State	$e_0^0$ (SRS)(2001-05)	CDR (2001-05)	ln[P(65+)] (2003)	$e_0^0$ (Estimate) Male (Female)
Andhra Pradesh	62.70(65.20)	8.43(6.79)	1.48(1.62)	61.75(64.70)
Assam	58.30(59.00)	9.57(8.72)	1.33(1.35)	57.45(57.29)
Bihar	62.00(60.10)	8.12(8.02)	1.45(1.42)	62.05(59.76)
Gujarat	62.80(65.00)	7.86(6.76)	1.35(1.62)	61.40(64.80)
Haryana	65.60(66.00)	7.58(6.31)	1.59(1.67)	64.87(66.38)
Himachal Pradesh	66.30(67.10)	7.92(5.97)	1.80(1.90)	66.63(69.56)
Karnataka	63.40(66.90)	7.97(6.65)	1.51(1.70)	63.13(65.91)
Kerala	71.30(76.30)	7.45(5.30)	1.91(2.12)	68.93(73.51)
Madhya Pradesh	57.80(57.50)	9.69(9.26)	1.45(1.60)	58.58(58.78)
Maharashtra	65.80(68.10)	7.36(6.37)	1.75(1.94)	67.27(69.06)
Orissa	59.20(59.20)	10.42(9.12)	1.68(1.73)	59.67(60.40)
Punjab	68.10(70.10)	7.31(6.22)	1.84(1.92)	68.38(69.24)
Rajasthan	61.20(62.20)	7.73(6.96)	1.40(1.61)	62.28(64.18)
Tamil Nadu	64.80(67.10)	8.15(6.87)	1.73(1.78)	65.35(66.19)
Uttar Pradesh	60.10(59.30)	9.36(9.20)	1.51(1.50)	59.99(57.83)
West Bengal	63.90(65.50)	7.07(5.99)	1.52(1.66)	65.17(66.98)

**Table 3. Estimated Life Expectancy at Birth for NE States of India, 2001-05.**

State	CDR Male (Female)	ln[P(65+)] Male (Female)	$e_0^0$ (Estimate) Male (Female)
Arunachal Pradesh	5.01 (4.95)	1.02 (1.03)	63.87 (62.76)
Assam	9.57 (8.72)	1.33 (1.35)	58.30 (59.00)*
Manipur	5.38 (3.76)	1.52 (1.56)	68.92 (71.12)
Meghalaya	8.30 (7.21)	1.06 (1.09)	57.03 (58.09)
Mizoram	5.89 (3.95)	1.31 (1.37)	65.37 (68.69)
Nagaland	4.30 (3.20)	1.10 (1.00)	66.34 (66.42)
Sikkim	5.72 (4.35)	1.36 (1.21)	66.23 (66.02)
Tripura	6.42 (4.77)	1.54(1.63)	66.92 (69.54)

#  $e_0^0$  for Assam is taken from Sample Registration System.

From Table 3, it is observed that during 2001-05 the life expectancy at birth for males (females) varies from 57.03 (58.09) for Meghalaya to the maximum of 68.92 (71.12) for Manipur. A gap of almost twelve point is noticed within an area of 26,2179 sq. km. Females has recorded comparatively higher life expectancy at birth than that of males. Arunachal Pradesh and Sikkim are the only north eastern states, where males have a higher life expectancy at birth than the females. The maximum gap in the life expectancy at birth for male and female is observed for the state of Mizoram (3.32 years). Assam, which is the gateway of the North Eastern states and having better infrastructure facilities with a majority of non tribal population shows a very low for males (58.30) as well as females (59.00) [SRS, 2001-05]. It is observed that out of 16 bigger and 7 smaller north eastern states of India, Manipur has occupied second position with respect to life expectancy at birth for both males and females.

### CONCLUSION

It is seen that majority of the smaller north eastern states of India have recorded a higher life expectancy at birth compared to the national average. The only notable exception to this is Assam and Meghalaya for males and Assam, Arunachal Pradesh and Meghalaya for females. It is interesting to note that, the states (viz., Manipur and Tripura) situated in the remotest part of the country are securing better position with respect to life expectancy at birth. This may be probably due to the fact that as they are situated far from the mainstream of the country, they can maintain their tradition, culture and food habit which may have a positive impact on the longevity of the people of these states.

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# Verbal Autopsy of 115 Cases of Intra Uterine Fetal Death at Tertiary Care Centre

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## ABSTRACT

**Objective:** To identify the maternal, socio-demographic fetal and medical care factors involved in fetal death. And to determine possible preventive action for reducing rate of fetal death in our country.

**Material and method:** A retrospective study of hospital records and death summaries of all intrauterine fetal death (IUFD) over the period from August 2011 to July 2012 was carried out.

**Results:** There were a total of 115 IUFD out of 920 deliveries giving fetal death rate of 125 per 1000 births. Low socio-economic profile 76%, illiteracy 66.09% and lack of prenatal care 65.22% are important epidemiological risk factors. The commonest fetomaternal risk factor was placental hemorrhage 20% followed by hypertensive disease of pregnancy 19.13% and prematurity 9.56%.

**Conclusion:** Placental hemorrhage, hypertensive diseases, lack of antenatal care, illiteracy and lack of health awareness emerged out as important risk factor for IUFD most of which are amenable to intervention.

**Keywords:** Intra Uterine Fetal Death, Risk Factors, Tertiary Care Centre

## INTRODUCTION

Fetal death at any point during gestation is a traumatic and devastating event not only to the family but also to the care giver. It is a sensitive indicator of socio-economic development of health care in the community. According to WHO estimation, there are annually more than 7.6 million perinatal deaths of which 57% are fetal deaths. Ninety-eight percent of the perinatal deaths take place in the developing world including "India".<sup>1,2</sup> Developed countries have seen dramatic decline in perinatal mortality because of investments in reproductive health and socio-economic conditions. Corresponding progress in low income countries has been slow. Because many births take place in domiciliary settings and are poorly reported especially still births<sup>3</sup>, these deaths constitute a major challenge for obstetricians, both in terms of fetomaternal care and in terms of the need for information and counseling of the affected couples. Perinatal mortality in India, hospital based statistics vary within 57 to 106 per 1000 births. In southern India, a population surveillance study has reported perinatal mortality rate of 68.8 in rural and 62.8 per 1000 in urban areas.<sup>4</sup>

Despite efforts to identify the etiologic factors contributing to fetal death, a substantial portion is still

classified as unexplained. These deaths are therefore difficult to prevent because the determinants have not been adequately identified. According to our hospital yearly report of birth registry, the still birth rate (both ante partum and intra partum fetal death after 28 weeks of gestation) was 125 per 1000 births. These results called for further investigations.

Fetal death as both a clinical and public health problem relatively little attention has been focused on their epidemiology. So, the purpose of this retrospective study is to help identify the maternal, socio-demographic, fetal and medical care factors involved in fetal deaths and to determine possible preventive actions for reducing the rate of fetal deaths in our health care set up.

## MATERIALS AND METHOD

This record based retrospective study was done in Obstetrics and Gynecology department of Guru Gobind Singh Medical College, Faridkot, the premier referral hospital and federal teaching institution in the state of Punjab.

## SAMPLE SIZE

We evaluated all fetal deaths from August 2011 to July 2012. All cases after 28 weeks of gestation or weighing 500 gm or more were included in the study.

The data was collected from the Medical Birth Registry. It is based on compulsory notification of all births with a gestational age of  $\geq$  24 weeks. A total of 115 still births were identified from over all 920 births.

## Procedure of data collection

Prior permission was taken from the administrative department to study the records. A standardized proforma and case definitions for data collection was developed. Every case was scrutinized from various aspects linked to be related to fetal death such as socio

demographic, feto-maternal, placenta and cord risk factors.

Diseases during pregnancy or delivery were classified according to the English version of the international classification of diseases Tenth revision (ICD-10).<sup>5</sup>

Exclusion criteria includes birth in which the gestational age was less than 28 completed weeks and birth weight <500gm.

## Statistical analysis

Data was tabulated and analyzed using Percentage and proportions.

N = 115

**Table 1: Maternal socio-demographic risk factors for fetal death**

		No. of cases	Percentage
1	<b>Age (in years)</b>		
(a)	<20 year	3	2.61%
(b)	20-24 year	37	32.17%
(c)	25-29 year	48	41.74%
(d)	30-34 year	19	16.52%
(e)	>35 year	8	6.96%
2	<b>Gravidity</b>		
(a)	G <sub>1</sub>	45	39.13%
(b)	G <sub>2</sub> -G <sub>3</sub>	49	42.61%
(c)	>G <sub>3</sub>	21	18.26%
3	<b>Education profile</b>		
(a)	Illiterate	76	66.09%
(b)	< 5	7	6.09%
(c)	5 <sup>th</sup> to 10 <sup>th</sup>	23	20%
(d)	>10 <sup>th</sup>	9	7.82%
4	<b>Received prenatal care</b>		
(a)	No	45	39.13%
(b)	Inadequate	30	26.09%
(c)	Yes	40	34.78%
5	<b>Occupation</b>		
(a)	Working	4	3.48%
(b)	Housewife	111	96.52%
6	<b>Socio Economic profile</b>		
(a)	Low	87	75.65%
(b)	Middle	28	24.35%
(c)	High	0	
7	<b>Birth weight in grams</b>		
(a)	500-1499	29	25.22%
(b)	1500-2500	56	48.69%
(c)	>2500	30	26.09%
8	<b>Gestational age in weeks</b>		
(a)	28-33	50	43.48%
(b)	34-40	63	54.78%
(c)	>40	2	1.74%

**Table 2: Risk Factors related to mother**

		No. of cases	Percentage
1	PIH		
(a)	Mild PIH	3	2.61%
(b)	Severe PIH	10	8.69%
(c)	Eclampsia	9	7.83%
2	Chronic hypertension	3	2.61%
3	Ruptured Amniotic Fluid	1	0.87%
4	Gestational Diabetes Mellitus	4	3.48%
5	H/o IUD/Abortion	28	24.35%
6	Traumatic delivery (Mechanical Factor)		
(a)	Shoulder dystocia	1	0.87%
(b)	Forcep delivery	1	0.87%
(c)	Obstructed labour	3	2.61%
(d)	Difficult breech delivery	1	0.87%
(e)	Rupture uterus	8	6.96%
7	Anemia (Hb in gm %)		
(a)	<7	48	41.74%
(b)	7-9	40	34.78%
(c)	>9	27	23.48%
8	Cholestasis of pregnancy	4	3.48%
9	Heart disease's	2	1.74%

**Table 3: Fetal Risk Factor**

		No. of cases	Percentage
1	Preterm labour	11	9.56%
2	Fetal distress/MSL	6	5.22%
3	Structural abnormality / NTD	5	4.35%
4	RH incompatibility	0	
5	Post datism >42 weeks	0	
6	<b>Fetal Sex</b>		
(a)	Male	68	59.13%
(b)	Female	47	40.87%

**Table 4: Placental Risk Factors**

		No. of cases	Percentage
1	3 <sup>rd</sup> Trimester Hemorrhage		
(a)	Placenta Praevia	11	9.56%
(b)	Abruptio	12	10.43%
2	Multiple Pregnancy	2	1.74%
3	Cord Risk Factors		
(a)	Cord Prolapse	4	3.48%
(b)	Cord entanglement around neck	1	0.87%
(c)	True cord knot's	0	

**Unexplained cases = 13 (11.30%)**

## RESULTS

Over all 115 subjects were analyzed in this study. The total intra uterine fetal death rate in study hospital was 125 per 1000 birth. The contribution to this from Antepartum being 77.39% and intrapartum was 22.61%. Most of the birth was normal delivery while 21 were delivered by caesarean section and only 1 was instrumental delivery.

Table 1 provides information on the association between maternal socio demographic characteristics and risk of fetal death. Out of the total IUFD 90.43% of mothers were of the age group 20-35 year while 9.57% were either less than 20 year or more than 35 year of age. 39.13 % fetal deaths occurred in primigravida, 42.61% occurred in 2<sup>nd</sup> and 3<sup>rd</sup> gravida and 18.26 % of IUFD were in gravida more than three. There was significant association between the maternal education and gravidity. It was found that 84.91% multipara were illiterate. Incidence of IUFD was two-fold higher in illiterate mothers. There was significant correlation between the number of pregnancies and receiving pregnancy care as 90% of mothers with two or more than two pregnancies did not receive any prenatal care. In effects, women with no antenatal visits or inadequate visits had a two-fold higher risk to lose their baby. Only 4 subjects were working and rest were housewives. Characteristic of low socio-economic status, such as lack of education and low income group was at higher risk of fetal death. The incidence of IUFD was higher in women living in rural area 97.39 %. Since the birth weight is affected by the gestational age, both variables were taken. 73.91 % were of less than 2500 gm at birth and 26.09 % had birth weight more than 2500gm. When we analyzed the gestational age in weeks at the time of still birth, 63 subjects were in between 34-40 weeks, 50 subjects were in between 28-30 weeks and Only 2 were more than 40 weeks.

Table 2 summarizes all maternal risk factors. We analyzed that the commonest cause of IUFD was hypertensive diseases of mother. This included pregnancy induced hypertension, eclampsia and chronic hypertension and this accounts for 21.74% of fetal loss. Mechanical factor accounts for 16.52 % of fetal loss. Diabetes mellitus, cholestasis of pregnancy, and heart diseases were also recorded as independent risk factors. 76.52% women had HB < 9gm % of which 41.74% women had HB < 7gm%. There was increased association between the history of IUFD/Abortion and early neonatal death with its repeated occurrence, seen in 28 subjects in the present study.

Table 3 shows the relationship between fetal risk factors and fetal loss. The Preterm birth was found to have the highest risk of still birth 9.56%. Fetal distress/meconium stained liquor (MSL) was present in 5.22 %.

Structural abnormalities were found to increase the risk of IUFD by 4.35%. The incidence of IUFD was found to be higher in boys 59.13 % then girls 40.87%. Variable such as growth retardation, rupture of membrane were in fact under the influence of other factors so we have not considered them as a risk factors on their own.

Table 4 shows the placental risk factors. In this group commonest cause was third trimester bleeding. Women with placenta praevia or abruptio had 20% increased risk of the fetal loss. Cord risk factors which included cord prolapse, cord entanglement around neck and true knots accounts for 4.35% of fetal death.

So over all maternal factors were responsible for 43.48% of fetal demise, fetal factors accounts for 19.13% of fetal loss, 26.09% of risk factors were related to placenta and in 11.30% of cases the cause of fetal loss still remained unexplained.

## DISCUSSION

The still birth rate of 125 per 1000 birth is higher but not dissimilar to that reported in other Indian Hospital based studies.<sup>4</sup>This may in part reflects the self selection or referral of high risk mothers to the study hospital. Over the past several decades the pattern of fetal death has changed. Some cause of fetal death such as syphilis, are no longer a significant problem and to Rh iso immunization, toxemia and diabetes has shown significant declines over the past three decade.<sup>6</sup>

According to some authors pregnancy at the age of 16 or less and the pregnancy at the age of 35 or above can increases the risk of fetal death<sup>7,8</sup> but our study did not agree with them. The IUFD was more commonly recorded in the age group of 20-29 years of mother which was in agreement with another study.<sup>9</sup>We found that illiterate women were at higher risk of losing their baby. Better education can directly influence the implementation of reproductive health. The total absence of antenatal care was associated with an increased risk of fetal loss and for those who had received some care, the risk increased as the number of visits decreased. Number of pregnancies in the current study was not found to be a significant risk factor. However, former studies founded that perinatal death was higher among the first born and after the 5<sup>th</sup> child.<sup>3</sup>In our study a significant correlation was found between the number of pregnancies and receiving prenatal care. 90% of subjects who had more than two pregnancies did not receive any prenatal care. Whatever the reason, this could lead to a major complication in the health of pregnant women and her pregnancy outcome. The majority of our subjects were living in the rural area, which is covered by the community health workers or primary health centre. They are not confident in taking care of pregnant women especially the high

risk group. Kiely<sup>10</sup> in a study of IUFD between hospitals of first and third level suggested that even for high risk pregnancies, the rate of IUFD is lower when mothers receive proper prenatal care. So our study points to the necessity of improved antenatal care of the mothers.

While analyzing we found that 43.48% of fetal death was attributed to maternal factors. Prenatal complications such as hypertension, pre-eclampsia, diabetes, cholestasis of pregnancy, heart diseases can increase the risk of fetal death, which is consistent with previous reports from developed and developing countries.<sup>4</sup> Pregnancy induced hypertension was the most common factor found in this category. Oxygenation of placenta can be completely blocked due to seizures of eclampsia, leading to fetal death. So continuous monitoring of blood pressure is suggested. Second most common risk factor was difficult labour or mechanical factors. Another study conducted at Iran<sup>9</sup> found the same association. This mortality is indicative of lack or inadequacy of antenatal and intranatal care. Our findings of increased risk of fetal loss with poor obstetric history are in accord with those of other workers.<sup>2,4</sup> Thus although past obstetric history is important for screening high risk mothers, the factors associated are not modifiable and can be used only as indicators of risk. Maternal anemia was associated with increased risk of still birth which was noted by Mavalankar also.<sup>4</sup> Nutritional intervention should cover childhood and adolescent to achieve adequate pre-pregnancy weight to ensure adequate weight gain and hemoglobin level during pregnancy.

History of vaginal bleeding during pregnancy was also associated with a substantially increased risk which is consistent with the findings of earlier investigators.<sup>2,3</sup> Abruptio placenta is often an attributed cause for IUFD<sup>11</sup> which is in accordance with our study. In the low socio-economic group of patients maternal malnutrition resulting in under perfusion of the placental site is said to increase the risk of abruption. We found umbilical cord prolapse to be an important risk factor for fetal death which was in accordance with previous study.<sup>7</sup> however another study showed no fetal death out of 25 cases, as all of the cases were quickly managed by crash LSCS protocol. Prematurity is often an attributing cause for still birth, which is in accordance with our study.<sup>1</sup> In our study congenital malformations was seen in 5 deaths. Though all congenital malformations were obviously not incompatible with life, it is possible that other malformations existed which were not diagnosed as no autopsy was carried out. RH incompatibility and post term pregnancies were not found as a significant risk factor<sup>9</sup> Male fetus seems to be more vulnerable to death. A study by Muin J. Khoury et al. documented that slower lung maturation among male fetus is a major contributing factor.<sup>13</sup>

## CONCLUSION

What is tragic is that most of these IUFD are preventable. Fetal deaths are still high in comparison with developed countries. Sustained reduction in IUFD will only be possible if modern high quality obstetric care is made available to all women through a system of professional midwifery and referral hospital care in the context of political commitment and accountability of health providers. Our study stressed the need for increased emphasis on prevention and treatment of obstetric hemorrhage, hypertensive disease of pregnancy and mechanical factors. Much need to be done for maternal health care in rural area, as most of the IUFD reported are referral from peripheral centers. Health education of masses along with good quality healthcare and transport facilities can prevent many IUFD.

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# Prevalence of Syphilis at a Tertiary Care Setup of Northern India: A Hospital Based Study

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## ABSTRACT

**Introduction:** Prevalence of sexually transmitted infections (STIs) shows regional variations. Though a rising trend of prevalence of viral STIs is observed, syphilis still continues to be a commonly diagnosed infection.

**Aim:** To find out the current status of syphilis at a tertiary care hospital.

**Materials and Methods:** A total 2,543 serum samples were received from out-patients department (OPD) during one year period from January 2011 to December 2011. All serum samples were subjected to Venereal Diseases Research Laboratory (VDRL) testing. Treponema Pallidum Hemagglutination Assay (TPHA) was performed on VDRL reactive samples.

**Observations:** Out of 2,543 serum samples screened for syphilis by the VDRL test, 472 (18.5%) samples were found reactive, out of these 78(3.06%) were TPHA positive. Among males the samples from patients of 0-20 years, 20-40 years and above 40 years were 54 (4.3%), 1028 (82.4%) and 165 (13.2%) respectively, whereas among females for the same age groups the distribution was 73 (5.6%), 1185 (91.4%) and 38 (2.9%) respectively. Dilution titres of VDRL reactive samples varies from 1:2(360), 1:4(102), 1:8(8), and 1:16(1) and 1:32(1). Among 472 VDRL reactive samples 78(16.5%) were TPHA positive.

**Conclusion:** Over a period of one year 18.5% serum samples were found VDRL reactive and 3.06% were TPHA positive. Prevalence of active syphilis in age group 20 to 40 was higher.

**Keywords:** Syphilis, Prevalence, *Treponema Pallidum* Hemagglutination Assay, VDRL.

## INTRODUCTION

Syphilis is a chronic disease with a waxing and waning course, the manifestations of which have been described for centuries. Transmission is mainly by sexual contact. The causative organism, *Treponema pallidum*, was first described in 1905. The incubation period for acquired primary syphilis ranges from 10 to 90 days<sup>1,2</sup>. Due to difficulty to culture the organism and the limitations of direct microscopy, serological testing is the mainstay of laboratory diagnosis. Prevalence of sexually transmitted infections shows regional variation<sup>3</sup>. Various epidemiological studies report a diminishing prevalence of syphilis including other bacterial STIs and a rising occurrence in viral STIs<sup>4</sup>. However a resurgence of syphilis has been observed and reported by some<sup>5,6</sup>. Syphilis occurs throughout the world and is more common among the under-privileged, in urban than rural areas<sup>7</sup>. The growing recognition of the major role that STIs play in reproductive health, the worldwide epidemic of these infections and their reproductive sequel it demands

greater commitment to their prevention and control. Syphilis is a multifaceted disease with serious implications for pregnant women and the unborn foetus. Syphilis in pregnant women is associated with low birth weight, prematurity, and intrauterine death<sup>8</sup>. The World Health Organization (WHO) estimated that 1 million pregnancies were affected by syphilis worldwide in 2004. Nearly half (n=460, 000) were result in abortion or perinatal death, 270,000 were born with low birth weight and/or prematurity, and 270, 000 were born with congenital syphilis<sup>9</sup>. The incidence of syphilis decreased dramatically during the 1980s, stabilized in the 1990s, and were increased since 1999/2000<sup>10</sup>. This increased incidence may be attributable to better surveillance systems and case detection. The emerging epidemic of human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS) globally has made sexually-transmitted disease (STD) control as one of the imperative strategies to decrease the HIV transmission<sup>11</sup>. Syphilis is still a common STD in many areas of the world, despite the availability of effective therapy. In 1999, the WHO

estimated that the worldwide annual incidence of sexually-acquired syphilis was 12 million cases. The target for the year 2010 was 0.2 cases of primary and secondary syphilis per 100,000 population, whereas in 2003 there were 2.5 cases per 100,000 population<sup>12</sup>. Prevention, timely detection and treatment should reduce this perinatal morbidity and mortality<sup>13</sup>. Even though syphilis continues to be a major health problem in India, the true incidence will probably never be known not only because of inadequate reporting but also due to the secrecy that surrounds them. Serological surveys continue to be the best source of information on the prevalence of syphilis.

VDRL test is performed to detect syphilis infection and will only be reactive from 2 to 4 weeks (or longer in certain cases) after infection. VDRL test is not a specific test for syphilis as other conditions, such as viral or bacterial infections, malaria, rheumatoid disease, yaws and autoimmune diseases are known to give false positive reactions. In some European countries such as Germany and the Netherlands the TPHA is used for screening. This provides a good screen for all stages of syphilis beyond the early primary stage but, because more primary infections are detected by a combination of VDRL and TPHA tests. In UK diagnostic laboratories screening with both VDRL and TPHA has been common practice for many years<sup>14</sup>. The combination of VDRL and TPHA tests provides sensitive and specific screening for all stages of syphilis other than very early primary infection. If VDRL is reactive (positive), a confirmatory test TPHA test must be performed to confirm syphilis infection. TPHA test is done only when VDRL test is positive. It is a test performed to confirm syphilis infection. A diagnosis of active syphilis is confirmed when both the TPHA and VDRL tests are positive. Hence, the present study was planned to determine the seropositivity rates by routine VDRL test of all the samples received and TPHA test in only VDRL positive samples in our tertiary care setup.

## MATERIALS AND METHOD

### Materials

The present study was conducted in postgraduate department of microbiology King George's Medical University Lucknow, on 2,543 serum samples received from out-patients department and indoor patients during one year period from January 2011 to December 2011. All serum samples were subjected to quantitative VDRL testing, using the standard methods<sup>15-17</sup>. TPHA was done on only VDRL reactive serum samples.

**Ethical clearance:** we take the approval for this research from ethical committee of King George's Medical University before starting the research work.

## TEST PROCEDURE

### Serum preparation

Five millilitre of venous blood was taken and allowed to clot. Serum was separated out and heat inactivated in a water bath at 56°C for 30 minutes. Then, the serum was kept at room temperature before testing.

### Antigen preparation

The VDRL antigen and buffered saline diluents was provided with the VDRL antigen kit. The antigen was prepared according to the manufacturer's instructions.

### Qualitative VDRL Test

The glass slides (2x3 inches) with 12 concave depressions of approximately 14-mm inside diameter were taken. Serum (0.05 ml) was added into one circle and a drop (1 of 60 ml) of antigen was added to the serum by the dropping pipette-no 55 nozzle tip. Serum and antigen were mixed with a wooden stick, and the slide was rotated for 4 minutes on a mechanical rotator set at 180 rounds per minute (rpm). The tests and results were read as manufacturer's instruction.

**Quantitative VDRL test:** A quantitative test was performed on all reactive and weakly reactive serum samples. Successive twofold dilutions of the serum were made in 0.9 percent saline. Each dilution was treated as an individual serum and tested as described under a qualitative VDRL test. The results were reported in terms of highest dilutions which gave a frank reactive reaction<sup>14,15</sup>.

### TPHA test

#### Qualitative method

Three wells of a micro-titration plate are required for a sample.

1. Add 190  $\mu$ l of diluents to Well 1.
2. Add 10  $\mu$ l serum to Well 1.
3. Using a micropipette, mix contents of Well 1 and transfer 25  $\mu$ l to Wells 2 & 3
4. Ensure that the Test and Control Cells are thoroughly resuspended. Add 75  $\mu$ l of control cells to Well 2. Add 75  $\mu$ l of Test Cells to Well 3.
5. Tap the plate gently to mix the contents thoroughly.
6. Incubate 45-60 minutes at the room temperature.
7. Read results.

#### Quantitative test

Each sample requires 8 Wells of a microtitration plate. Labelled A through to H.



1. Add 25  $\mu$ l of diluent to Wells B to H inclusive.
2. Transfer 25  $\mu$ l of 1:20 serum dilution from screening test to Wells A and B.
3. Take 25  $\mu$ l of diluted serum from Well B and serially dilute from Wells B to H inclusive in 25  $\mu$ l aliquots, discarding 25  $\mu$ l of diluted serum from Well H.
4. Ensure that the Test Cells are thoroughly resuspended. Add 75  $\mu$ l of test cells to wells A to H inclusive. This will give a dilution of serum of 1/80 in Well A through 1/10240 Well H.
5. Shake the plate gently to mix the contents thoroughly.
6. Incubate for 45-60 minutes at the room temperature.
7. Read results as the standard protocol.

**Observation and results**

A total of 2,543 serum samples were screened for syphilis by the VDRL testing over a period of one year and 472 (18.5%) serum samples were found to be reactive and 78(3.06%) were TPHA positive out of VDRL reactive samples. Out of total 2,543 samples, 1247 (49%) were of male patients while 1296 (51%) were of female patients showing almost equal sex distribution of samples (table-1). Among males the samples from patients of 0-20 yrs, 21-40 yrs and above 40 yrs were 54

(4.3%), 1028 (82.4%) and 165 (13.2%) respectively, whereas among females for the same age groups the distribution was 73 (5.6%), 1185 (91.4%) and 38 (2.9%) respectively(table-2). Of the total samples 483 (18.9%) samples were from patients attending Antiretroviral Therapy (ART) centre. Of these ART samples 272 (10.6%) were of male patients and 211 (8.2%) of female patients. Of total VDRL reactive samples 88 (3.46%) were from ART Centre. Among VDRL reactive ART samples 46 (1.8%) and 42 (1.6%) samples were of males and females respectively. Non-ART samples were 2060(81.1%), of these 865(34%) were of male, 1195(46.9%) were of female patients. Reactive samples 384(15.1%) were from non ART centre, among these 152(5.9%) male and 232(9.1%) female patient samples (table-3). Dilution titres of VDRL reactive samples vary from 1:2(360), 1:4(102), 1:8(8), 1:16(1) and 1:32(1) (table-4). Among 472 VDRL reactive samples 78(16.5%) were TPHA positive. In the VDRL dilution titres of 1:32 and 1:16 the positivity rate of TPHA was 100% and among 1:8, 1:4 and 1:2 were 75%, 33% and 10% respectively (table-4). Active syphilis in age group 0-20years, 20-40years, and above 40years were in 2(1.57%), 71(3.20%), 5(2.46%) patients respectively (table-2).

**Table 1. Sex-wise distribution of samples.**

Sex	No of Samples	Reactive
Male	1247 (49%)	250 (9.8%)
Female	1296 (51%)	222 (8.7%)

**Table 2. Age-wise distribution of samples.**

Age	Male	Female	Total	VDRL and TPHA positive
0-20 yrs.	54(4.3%)	73(5.6%)	127(4.9%)	2(1.57%)
>20-40 yrs.	1028(82.4%)	1185(91.4)	2213(87%)	71(3.20%)
>40 yrs	165(13.2%)	38(2.9%)	203(7.9%)	5(2.46%)
Total	1,247(49%)	1,296(51%)	2,543	78(3.06%)

**Table 3. Distribution of VDRL reactive samples on the basis of source**

Source of sample	No. of samples		Reactive result	
ART centre	483 (18.9%)		88 (3.4%)	
	<b>Males</b>	<b>Females</b>	<b>Males</b>	<b>Females</b>
	272 (10.6%)	211 (8.3%)	46 (1.8%)	42 (1.6%)
Non-ART centre	2060 (81.1%)		384 (15.1%)	
	<b>Male</b>	<b>Females</b>	<b>Males</b>	<b>Females</b>
	865(34%)	1195(46.9%)	152(5.9%)	232(9.1%)

**Table 4. Distribution of VDRL reactive samples on the basis of dilution titre.**

Dilution titre of VDRL	Male		Female		Total VDRL positive	TPHA positive
	ART samples	Non-ART samples	ART samples	Non-ART samples		
1:2	31	135	34	160	360	36
1:4	13	38	5	46	104	34
1:8	0	4	2	2	8	6
1:16	1	0	0	0	1	1
1:32	0	0	1	0	1	1

## DISCUSSION

VDRL, a slide flocculation non-treponemal test, provides a simple, rapid, convenient and economical procedure for serologic testing of syphilis. The non-treponemal tests have a sensitivity of 70 percent to 99 percent, depending on the stage of disease. The sensitivity of the test approaches 100 percent during the secondary phase of the disease. The specificity of the non-treponemal tests can be used for a rapid and exact quantitative titration of reactive serum samples. It is well suited for mass serologic surveys, and our institution has extensive experience with this test. The present study revealed that the 1 year seroprevalence of syphilis in patients attending our institute is 18.5% percent. VDRL reactivity among males are slightly higher i.e. 9.8% as comparison to females i.e. 8.7% (statistically not significant). Among the patients of ART centre 3.4% of them have reactive result with males having 1.8% reactivity as comparison to females having 1.6% reactivity (statistically not significant). Also the samples from ART centre comprise 18.9% of the total samples indicating high prevalence of HIV positive patients attending the tertiary care hospital. The reactivity among the patients attending the ART centre is 18.2% is almost similar to the patients from other than ART centre i.e.18.6 %. High dilution titre is seen in samples from ART centre, while lower dilution is similarly distributed in both ART centre and other samples (table- 4). TPHA is a specific test for syphilis, patients having TPHA and VDRL positive tests are supposed to be cases of active syphilis. Active syphilis in age group 0-20years, 20-40years, and above 40 years are 2(1.57%), 71(3.20%), 5(2.46%) patients respectively (table-2). Prevalence is higher in age group of 20-40 years which is the most active reproductive age and chances of acquiring infection from their partner. According to Jain. A, et al prevalence of syphilis in India is 7.36%[1], However in our study prevalence is 3.06%. It may be due to that study was done on patients attending STI clinics and our study was done on patients attending general OPD. A study was done by World Health Organisation, in India routine screening of pregnant women for syphilis done at the district levels. Available information indicates that the prevalence of maternal

syphilis has remained at around 1.5% during 2003 to 2007. While it is true that several studies have found few or no cases of syphilis among the general population<sup>18, 19</sup>. Baqi et al reported a 37% prevalence of syphilis among Hijras in Karachi<sup>20</sup>. Although the prevalence in our study is low due to no specific high risk group.

This study shows a high seropositivity for syphilis among the patients attending our tertiary care hospital and a high prevalence of active syphilis, indicating high prevalence of sexually transmitted diseases in Lucknow and its neighbouring districts in Uttar Pradesh India.

**Conclusion:** Over a period of one year 18.5% serum samples were found VDRL reactive and 3.06% were TPHA positive. Prevalence of active syphilis in age group 20 to 40 was higher than other age groups.

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# Risk Factor Profile for Non Communicable Diseases among Postmenopausal Women in Delhi

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## ABSTRACT

**Background:** Non-communicable diseases (NCDs) are rapidly on the rise as the world still struggles to cope with infectious and communicable diseases. All countries, irrespective of their stage of economic development, face an increasing burden of NCDs. NCDs including cardiovascular disease, diabetes, hypertension, obesity and cancers are increasing in alarming proportions.

**Objective:** To find the magnitude of risk factors of non communicable diseases among postmenopausal women in Delhi

**Material and method:** A community based cross-sectional study was conducted at Palam, an urbanized village in Delhi. A total 416 postmenopausal women were interviewed, examined and investigated.

**Results:** The most common risk factors of NCDs among postmenopausal women found in the study were dietary factors, obesity and stress. These women consumed more salt (82.7%) and fats (45.2%), and less vegetable and fruits (64.2%). The magnitude of stress was 53.2% followed by truncal obesity (46.8%) hypertension (39.6%), smoking (17.8%) and diabetes (13.9%).

**Conclusions:** The burden of risk factors for non-communicable diseases (NCDs) among the postmenopausal women in Palam Village is high. Programs related to lifestyle change focusing on the need of postmenopausal women should be framed.

**Keywords:** Risk Factors, Non communicable Diseases, Postmenopausal Women

## INTRODUCTION

According to the World Health Report 2002, globally, NCDs account for almost 58.5% of deaths and 45.9% of the global burden of disease. Based on the current trends, these diseases are predicted to account for 73% of global deaths and 60% of the global burden of the disease by the year 2020<sup>1</sup>.

About 85% of the global burden of NCDs is borne by low and middle income countries. Over the next 30 years the burden of disease from NCDs is expected to rise by 60%<sup>2</sup>. The past two decades have seen sharp increase in NCDs, mainly coronary artery diseases,

diabetes, hypertension, obesity and cancers.

NCDs are linked by common and preventable risk factors, notably high blood pressure, high blood cholesterol and overweight, and by related major behavioral risk factors: unhealthy diet, physical inactivity and tobacco use. With changing life styles and dietary habits, NCDs have emerged as an important public health problem in India.

The prevalence of most NCDs increases with age and are more common in men as compared to women<sup>2</sup>. Women lose this advantage after menopause. A common interpretation is that, compared with men, women are biologically protected against many diseases until they are middle aged, but after menopause, females are equally prone as their male counterparts. After menopause the risk of the cardiovascular disease (commonest non-communicable disease) doubles for postmenopausal women due to withdrawal of estrogen.

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To develop a strategy for prevention of non communicable diseases epidemic, it is necessary to assess current level of risk factors of NCDs among postmenopausal women. The existing literature on prevalence of risk factors for non-communicable diseases among postmenopausal women in developing countries is limited. The present study was planned to find the magnitude of risk factors for non-communicable diseases among postmenopausal women in Delhi.

### **OBJECTIVE**

To find the magnitude of risk factors of non communicable diseases among postmenopausal women in Delhi

### **MATERIAL AND METHOD**

The present study was community based cross-sectional study conducted in the Palam Village located in South-west Delhi. The study population comprised of all postmenopausal women residing in the study area. Postmenopausal women were identified by the criteria of cessation of menstrual period for more than 12 consecutive months (WHO<sup>3</sup> 1996).

The total population of study area is estimated to be 19,000<sup>4</sup>. Considering the mean age at menopause as 50 years in India<sup>5</sup>, approximately 830 women (4.4% of 19000)<sup>12</sup> were likely to be above 50 years of age in the study area. Due to time constraints, it was decided to enroll 50% of postmenopausal women and for this alternate households were visited by door to door visit. Thus a total of 438 postmenopausal women were enlisted.

All the enlisted women were explained about the purpose of the study. Those who agreed to participate were included in the study and informed consent was taken. Out of 438 women 22 women refused consent for the interview. Thus a total of 416 postmenopausal women were interviewed and examined for assessing risk factors. Blood investigation was carried out in 369 women as 47 women refused for blood sampling.

A pretested semi-structured interview schedule was used to collect information on socio-demographic characteristics and risk factors for non-communicable diseases. In history taking (i) Dietary factors: daily per capita oil, fat and salt intake, vegetable and fruit consumption was assessed, (ii) Global physical activity questionnaire<sup>6</sup> (GPAQ): - Version 2 was used to assess physical activity (iii) General Health Questionnaire<sup>7</sup> (GHQ-12) was applied to assess the stress, family history of NCDs, history of substance abuse (smoking, chewing tobacco and alcohol), personal medical history and history of reproductive factors was taken.

After interviewing each study subject was examined. All measurements (blood pressure, height, weight, waist circumference and hip circumference) were taken according to standard techniques<sup>6</sup>. For blood investigation (blood sugar, serum cholesterol and serum triglyceride), overnight fasting blood sample was collected by vene puncture.

The data was coded and analyzed using SPSS version 12 software. Averages and measures of dispersion (standard deviation) were applied for analyzing quantitative data.

### **RESULTS**

The study was conducted in an urbanized village, Palam located in south west Delhi, India. Out of 438 women, a total of 416 postmenopausal women were interviewed and examined (non response rate of 5.0%). Blood investigation was done in 369 women out of 416 women (refusal rate of 11.3%)

The socio-demographic profile of postmenopausal women is shown in table 1. The age of study subjects ranged from 38-83 years with mean age of 56.6±7.8 yrs. Majority of women were Hindus (97.6%), married (76.9%) and housewives (94%). Almost half (47.4%) of women were illiterate. About half (45.0%) of women belonged to Lower-middle socio-economic status according to modified Kuppuswamy scale.

Table 1: Socio-demographic profile of postmenopausal women

Socio-demographic factors	Number of women (n=416)	Percentage
<b>Age Groups</b>		
<44 yrs	12	2.8
45-49 yrs	69	16.6
50-54 yrs	86	20.7
55-59 yrs	96	23.2
60-64 yrs	73	17.5
65-69 yrs	47	11.3
>= 70 yrs	33	7.9
<b>Religion</b>		
Hindu	406	97.6
Others	10	2.4
<b>Marital status</b>		
Married	320	76.9
Widowed	93	22.4
Never married	3	0.7
<b>Type of Family</b>		
Nuclear family	137	32.9
Joint family	279	67.1
<b>Literacy Status</b>		
Illiterate	197	47.4
Primary	62	15.0
Middle	73	17.5
High school	48	11.5
Senior secondary and above	36	8.6
<b>Socio-Economic Status*</b>		
Upper	4	1.0
Upper middle	51	12.0
Lower middle	187	45.0
Upper lower	155	37.4
Lower	19	4.6

\* Modified Kuppaswamy Scale as per Consumer Price Index 2007

**Table 2: Risk factors of non communicable diseases among study subjects**

Risk factor	No. of women	%	Mean value	Range
<b>Lifestyle factors</b>				
Salt intake ( $\geq 5$ gm/day)	324	82.7	6.8 $\pm$ 1.4	4-11
Vegetable and fruit intake (<400 gm/day)	267	64.2	292 $\pm$ 143	20-700
Stress (stress score >15)	221	53.2	14.8	6-25
Oil and fat intake ( $\geq 25$ gm/day)	188	45.2	24.4 $\pm$ 11.3	8-74
Smoking(current smoker)	74	17.8	-	-
Physical activity (low)	47	11.4	-	-
Tobacco chewing (current tobacco chewer)	18	4.3	-	-
<b>Anthropometric measurements</b>				
Waist circumference ( $\geq 80$ cm)	195	46.8	85.6 $\pm$ 11.7	60-122
Waist hip ratio ( $\geq 0.85$ )	150	36.1	0.86 $\pm$ 0.05	0.69-1.11
Obesity (BMI $\geq 30$ kg/m <sup>2</sup> )	53	12.7	25.3 $\pm$ 4.1	14.5-36.6
<b>Clinical and biochemical parameters</b>				
Hypertension* ( $\geq 140/90$ mmHg)	165	39.6	135.7 $\pm$ 20.2/ 82.1 $\pm$ 9.7	95-201/ 58-132
Diabetes* (FBG $\geq 126$ mg/dl)	58	13.9	91.06 $\pm$ 24.8	59-330
Serum Cholesterol (n=369) ( $\geq 250$ mg/dl)	16	4.4	154.7 $\pm$ 64.0	102-294
Serum Triglyceride (n=369)( $\geq 200$ mg/dl)	11	3.0	101 $\pm$ 61.6	41-479
<b>Reproductive risk factors (for breast cancer)</b>				
Duration of breast feeding (< 12 months)	6	1.4	95.1 $\pm$ 44.4	0-240
Age at menopause( $\geq 55$ yrs)	5	1.2	47.4 $\pm$ 3.6	35-56
Parity (null parity)	3	0.7	4.3 $\pm$ 1.8	0 - 10
Age at first child birth ( $\geq 30$ yrs)	3	0.7	19.0 $\pm$ 3.0	15-32
Age at menarche(< 12 yrs)	0	0	15.06 $\pm$ 1.2	12-18
Hormonal intake (OCP / HRT** use)	0	0	-	-

\*Includes known cases of hypertension and diabetes

\*\* Oral contraceptive/Hormonal replacement therapy

In lifestyle factors, the major risk factors were high salt intake (82.7%) followed by less vegetable and fruit intake (64.2%), high oil and fat intake (45.2%), stress (53.2%) and smoking (17.8%). Family history of hypertension was the commonest (20.9%) followed by diabetes (14.9%) and obesity (12.5%).

Obesity was highest (46.8%) as per waist circumference, followed by waist hip ratio (36.1%) and BMI (12.7%). Hypertension (39.6%) was most common clinical risk factor. Prevalence of diabetes was 13.9%. Cholesterol and triglyceride levels were high in 4.4% and 3% of women respectively. Magnitude of reproductive risk factors for breast cancer among study subjects was low; less duration of breast feeding (1.4%), late menopause (1.2%), nulliparity (0.7%) and elderly primigravida (0.7%).

## DISCUSSION

The present study was conducted among postmenopausal women to assess the magnitude of risk factors of NCDs. A total 416 women were interviewed. The mean age of postmenopausal women was 56.6 $\pm$

7.8 years with range of 38 to 83 years. Similar findings were reported by Bulliya G<sup>8</sup> (2000), Nellore and Rosi R et al<sup>9</sup> (2006), Italy. About half (47.4%) of the women were found illiterate and majority (94%) of them were housewives. Both of these findings were in agreement with census of India (2001).

All women were found to have one or more risk factors for non-communicable diseases (NCDs), average being 4.7 risk factors per woman. Majority (89.5%) of women were found to have three or more risk factors and more than half (57.5%) of women had five or more risk factors.

More than three fourth (82.7%) of women were at risk because of high salt intake. Mean dietary salt intake of the study group was 6.8 $\pm$ 1.4gm/day which was higher than the WHO<sup>10</sup> recommended value of less than 5gm/day. Similarly, Singh RB et al<sup>11</sup> (1997) and Radhika G<sup>12</sup> et al (2007) reported high mean salt intake as 6.1 gm/day and 8.5 gm/day respectively in their study. Nearly two third (64.2%) of women consumed vegetables and fruits less than recommended although 93% of them were vegetarian. The mean vegetable and fruit intake

was  $292 \pm 143$  gm/day which was lower than the WHO<sup>108</sup> recommended value of more than 400 gm/day. In the present study, more than half (53.2%) of women had stress and about half (45.2%) of women were at risk due to high fat and oil intake which is an alarming finding.

The prevalence of smoking, one of the important risk factor for cardiovascular diseases was found to be higher than the prevalence reported in most of the other studies which ranged from 1.2% to 12.1%. This difference may be due to the reason that women belonged to rural background.

Obesity is closely related to cardiovascular risk factors, lipid metabolism and impaired glucose metabolism. In the present study almost half (46.8%) of women had truncal obesity (as per waist circumference  $\geq 80$  cm). The finding is in conformity with that of Kaur K and Mogra R<sup>14</sup> (2006). Also it is in agreement with the fact that total body fat content increases in women with age and progression of menopause lead to selective accumulation of body fat in the central region of the body<sup>3</sup>.

Hypertension is a major contributor to the morbidity and mortality from coronary heart disease and stroke. About two fifth (39.6%) of women were found to have high blood pressure. Similar findings were reported by various studies<sup>15, 16</sup>. It is observed that 13.9% of women were diabetic and at risk of other NCDs.

The present study has shown the high burden of risk factors of NCDs among postmenopausal women. Most common risk factors were diet, stress, obesity, hypertension and smoking. Most of the risk factors were modifiable which can be modified by simple interventions.

Postmenopausal women need to be more aware of the modifiable risk factors and change their lifestyle to reduce the burden of NCDs. The women suffering from hypertension, diabetes and obesity should undergo regular treatment to reduce the risk of other NCDs. Post menopausal women particularly those with family history of NCDs should undergo periodic screening. Interventions required for this can be achieved through behavior change communication as well as providing medical care services.

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**Conflict of interest:** None

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The study protocol was approved by Ethics Committee of Lady Hardinge Medical College and Associated Hospitals, Delhi University.

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# Substance use: Risk Factors among Male Street Children in Delhi

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## ABSTRACT

**Background:** Street children are often at greater risk of drug abuse and drug related morbidities than the general population. In fact, the very individuals who might benefit the most from drug abuse treatment and prevention efforts are the least studied, the least understood and the most elusive to clinicians, researchers and others concerned with understanding and improving the health of the street children.

**Objectives:** To know the magnitude and socio-demographic risk factors of substance use among male street children in Delhi.

**Materials and Methods:** 242 adolescent male street children were interviewed by oral questionnaire method at the time of registration at a Non Governmental Organization working for them.

**Results:** More than half (54.5%) of the subjects were indulged in substance use. The commonly used substances were tobacco (49.2%), inhalants (19.0%), alcohol (16.9%) and ganja (11.6%). Substance use was found to be significantly associated with age of study subjects ( $p < 0.05$ ), level of education ( $p < 0.05$ ), duration since leaving home ( $p < 0.001$ ), working status ( $p < 0.01$ ), substance use in parents ( $p < 0.01$ ), domestic violence in the family ( $p < 0.001$ ) and history of physical abuse ( $p < 0.001$ ).

**Conclusions:** Substance use in street children was found to be significantly associated with substance use in parents, domestic violence in the family and physical abuse. Effective drug prevention and support programs for street children should be formulated.

**Keywords:** Risk behaviour, Street children, Adolescents, Salaam Baalak Trust, Substance use

## INTRODUCTION

The capital of India provides shelter to approximately one lakh street children, mostly runaway from neighboring states.<sup>1</sup> Such children are more prone to indulge in risk behaviour related to substance use, sexual behaviour as well as anti-social activities. Being homeless, they are deprived of adult care and often indulge in substance use. WHO mentions that many of the leading causes of premature death, disease and disability in present and future can be reduced by preventing the risk factors related substance use among street children. According to WHO, of the total 10-30 million street children in the world, an estimate 25-90%

indulge in substance use.<sup>2</sup> The non-medical use of chemical substances in order to achieve alterations in psychological functioning has been termed as substance use.<sup>3</sup> It is usually seen that risk taking behaviors begin to manifest from the middle adolescence onward.<sup>4</sup> Boys are more likely than girls to smoke, drink and use drugs. This holds true in developing countries too, although rates for girls are increasing faster.<sup>1</sup>

The present study sought to know the magnitude of substance use and risk factors related to it among adolescent male street children in Delhi, to devise effective preventive strategies against substance use.

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## OBJECTIVES

The objectives of the study were to estimate the magnitude of substance use and to study socio-demographic factors related to it, among runaway male adolescents at the time of enrolment in an NGO.

## MATERIAL AND METHOD

This cross sectional study was carried out in Central Delhi at Shelter homes and contact points of 'Salaam Baalak Trust', one of the five Non-Government organizations (NGOs) working for the street children in Delhi. Children aged 5-19 years picked up through child help lines of Delhi Police and referred to these NGOs.

All newly registered male adolescents (10-19 years) enrolled with the organization in year 2008 and staying for a minimum duration of 24 hours comprised the study population. Only new registration were considered to avoid any bias resulting due to the stay with the NGO. The criteria for exclusion were (a) mental retardation (as per the assessment of the psychologist) (b) inability of the subject to understand either Hindi or English. The age of the child was taken from the official records at the time of admission. A total of 242 male adolescents were included in the study. Interviews were carried out on one to one basis as soon as possible after the enrolment. A written informed consent was taken from the NGO. Privacy and strict confidentiality were assured and maintained. Repeat visits were made if required. A self made, predesigned, pretested semi

structured interview schedule was used to record the information on personal identification, socio demographic profile and assessment of risk behavior related to substance use. This questionnaire was pretested on 25 children of the NGO and suitably modified.

## STATISTICAL METHOD

For data entry, SPSS version 12 was used. Chi-square test was applied to detect any significant association. P value less than 0.05 was considered as statistically significant.

## RESULTS

A total of 502 (390 boys and 112 girls) children aged 5-19 years were registered during the study period. Out of 390 boys, 258 boys belonged to 10-19 year age group. Three children could not be interviewed because of short duration of stay; eight children with repeated registrations and five children with mental retardation (as per the assessment of the psychologist) were excluded from the study. Thus 242 children constituted the study population.

**Table 1: Risk Factors For Substance Use**

Risk Factors (N=242)			Substance Use	%	P Value
Age (Years)	10-13	81	39	48.1%	<0.05
	13-16	97	49	50.5%	
	16-19	64	44	68.8%	
Level Of Education	Illiterate	100	63	63%	<0.05
	Primary/Just Literate	113	50	44.2%	
	Middle-high School	29	19	65.5%	
Duration Since Leaving Home	≤1 Yrs	161	69	42.9%	<0.001
	1-5 Yrs	63	48	76.2%	
	>5 Yrs	18	15	83.3%	
Working Children	Working	200	119	59.5%	<0.001
	Not Working	42	13	31.0%	
Substance Use In Parents	Present	194	115	59.3%	<0.001
	Absent	48	17	35.4%	
Living Status Of Parents	Both Parents	162	87	53.7%	>0.05(0.39)
	Broken Family	58	30	51.7%	
	Step Parents	22	15	68.2%	
Domestic Violence In The Family	Present	140	120	85.7%	<0.001
	Absent	102	12	11.8%	
Maltreatment	Present	143	116	81.1%	<0.001
	Absent	99	16	16.2%	

The adolescent runaways were in the age bracket of 10-19 years. The mean age of the boys was 13.8±2.4 years with 73.6% children being under 16 years of age. A large proportion of these children were found to be illiterate (41.5%) with only 8 children educated up to

high school level. None had completed senior secondary level of education. A large majority, 200(82.6%) of these adolescents were engaged in various employments and only 42 (17.4%) were not working before being brought to shelter homes. Among these 25 (59.5%) admitted

engagement in antisocial activities like stealing, shoplifting, pick pocketing and drug trafficking. Working in dhabas was the most common occupation followed by rag picking.

Out of 242 children interviewed 58 (24%) were from broken families while another 9.1% had step parents. Parental substance abuse was reported by majority of the adolescents (80.2%). Physical abuse and being witness to domestic violence was reported by 59.1% and 57.9% of the respondents respectively.

**Table 2: Substances Used By Study Subjects**

Substance Used		Number(n= 242)	(%)
Tobacco	Smoking	90	(37.2)
	Chewing	65	(26.9)
Inhalants/ Solvents		46	(19.0)
Alcohol		41	(16.9)
Ganja		28	(11.6)
Charas		15	(6.2)
Bhang		11	(4.5)
Cocaine		8	(3.3)
Heroin		2	(0.8)
No Substance Use		110	(45.5)

\*Multiple Responses

The study revealed that more than half 132(54.5%) of study subjects were substance users (Table 2). Maximum number of study subjects i.e. 90(37.2%) were smokers followed by tobacco chewers i.e. 65(26.9%) and inhalant or solvent users 46(19.0%).

The minimum age at starting substance use in present study was 6 years with the mean age of initiation of substance use was 11.5 + 2.6 years. About two third (67.4%) of children who were substance users started substance use due to peer pressure. Earnings from work and pocket money were the main sources of money for meeting expenditure on various substances. As many as 117 children (84.7% of substance users) cited this as the main source of money to buy the substances. Other sources to meet expenditure for substance use were from borrowing from friends and stealing.

The risk behaviour was found to be significantly associated with age of the subjects, level of education, duration since leaving home, employment status, substance use in the family, domestic violence and physical abuse in the family (Table -1).

## DISCUSSION

More than half of the study subjects i.e. 132(54.5%) were found to indulge in substance use. This reflect easy availability of intoxicating substances to children and indirectly reflecting ineffective implementation of

the several existing legislations like “The Cigarette and other Tobacco Products Act, 2003”, The Delhi Anti-Smoking and Non-Smoking Health Protection Act, 1996 and the Narcotics and Psychotropic Substances Act, 1985. The minimum age at starting substance use in present study was 6 years. Early initiation may result in addiction and prolonged exposure to known carcinogens. The present study revealed that 89 (67.4%) children who were substance users started substance use due to peer pressure. Similar findings were reported by other researchers (Pandey R et al<sup>5</sup>, 1991; Saini et al<sup>6</sup>, 1997). This implies that rather the influence of the father as role model or otherwise, it may be the peer pressure which influences the substance use in these children. Also the exposure on the streets is a more important factor leading to substance abuse, through exploitation and otherwise. Substance use was found significantly more common in older children than in younger age group (p<0.05). This may indicate a trend and warrants further research. Substance use was more common in children who were illiterate (p<0.05). Tapia-Conyer R et al<sup>7</sup> (1995) found that risk of inhalant use is associated with less number of years of formal education. Thus it concludes that increase in level of education among street children may help them to stay away from substance use. Substance use was found more common in working children (p<0.01). The earning capacity of working street children coupled with lack of parental supervision further enhances the vulnerability of these children to substance abuse. In the present study substance use was significantly more common in children who stayed for longer time on the street (p<0.001). The reasons for this may be homelessness and lack of support and supervision from parents as well as the society, which have been cited to be important causes of drug abuse in street children. The study revealed that approximately 60% (115/194) of children with a history of parental substance abuse, reported use of a substance (smoking/alcohol/drug). These findings were in agreement with those of Howard MO et al<sup>8</sup> (1999) and Tapia-Conyer R et al<sup>7</sup> (1995) who reported that substance use among children was significantly associated with substance use in the family. Parental psychoactive substance use has an indirect effect on the substance use of adolescents. Substance use was high in children having step parents. Domestic violence witnessed by the child and physical abuse of the child emerged as the significant predictor of substance use in the present study (p<0.001). Other researchers have found similar association (McEwen R et al<sup>9</sup>, 1992; Tapia-Conyer R et al<sup>7</sup>, 1995). This finding implies that adverse family environment continues to exert its harmful influences on children even after they leave home and come to streets. This may be due to the inability of children to overcome memories of traumatic experiences at home. The current study has

several limitations. First as the study was conducted on adolescent males, the results of the study may not generalize to female adolescents who engaged in substance use. Second, as the informers in the present study were children who may have underreported the fact of substance use due to fear and social stigma attached to consumption of intoxicating substances. The results of the present study suggest that the children coming to shelter homes are at high risk for substance use and require active intervention. The results also indicate that despite existing legislations in the Capital banning sale of intoxicating agents to children, these agents continue to be widely available to this vulnerable group. Considering the negative health and social effects of substance use in children, there is a need to ensure strict enforcement of such laws.

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# Syndromic and Laboratory Diagnosis of Reproductive Tract Infections among Pregnant Women in Urban Field Practice Area, Hubli, Karnataka

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## ABSTRACT

Reproductive tract infections (RTIs) are a world wide public health problem, ignored by many women, before conception and also during pregnancy. This can lead to devastating consequences for both mother and fetus. Hence, a community based study was done in Hubli, to know the burden of the disease among pregnant women in the population. The pregnant women were interviewed, examined and specimens were collected for laboratory analysis of Gonorrhoea, Trichomoniasis, Vaginal Candidiasis (VC), Bacterial Vaginosis (BV) and Syphilis in Urban Health Training Centre (UHTC), attached to Karnataka Institute of Medical Sciences (KIMS), Hubli.

The prevalence of RTIs among pregnant women were 66.6% based on their symptoms and 61.5 % based on clinical examination. The laboratory tests revealed a prevalence of 51.28 %, including 8.9% with sexually transmitted infections. Syndromic diagnosis based on symptoms, was confirmed with laboratory tests, which was 53.9% of the cases. The Sensitivity of Syndromic approach, based on symptoms, over laboratory diagnosis of RTI was 70%, Specificity was 36.8% and Positive Predictive Value was 53.9%. To conclude the prevalence of RTI among pregnant women is high, confirmed by laboratory tests. Hence feasible tests should be advocated in the field for appropriate management of these cases.

**Keywords:** *Reproductive Tract Infections, Syndromic Approach, Laboratory Diagnosis*

## INTRODUCTION

Reproductive Tract Infections (RTIs), are a serious health concern among women, as they are the bridge of transmission for both male partner and the fetus. <sup>(1)</sup>

National Family Health Survey-2 has also reported that 39.2% women in India have one or more reproductive tract infections. <sup>(2)</sup> Pregnant women, like the general STI clinic population have equal chances of acquiring RTI/STI infections. <sup>(3)</sup> The consequences of RTI in pregnant women are potentially devastating, which includes post abortal and puerperal sepsis, fetal and perinatal deaths, ectopic pregnancy, chronic pelvic pain and emotional distress. <sup>(4)</sup>

Although early detection and treatment of STDs can prevent complications and minimize the severity of long-term sequelae, many infections go untreated. Cultural barriers as well as poor understanding of the significance of symptoms may also reduce care-seeking by women. <sup>(5)</sup>

WHO has identified syndromic approach for identifying and managing cases with RTIs/STIs which provide health workers with a tool to improve the diagnostic process. Syndromic management identifies consistent group of symptoms and easily recognized signs and provide guidelines for treatment. <sup>(6)</sup>

As RTI in many cases are asymptomatic, a large proportion of women suffer morbidity silently and are reluctant to seek care. Hence, it is difficult to assess the true magnitude of the problem or the patterns of morbidity, from which women suffer. Ultimately this leads to complications, making the situation even worse. <sup>(7)</sup>

An effort has been made on this regard, to know the burden of the disease among pregnant women by Syndromic approach and using feasible laboratory tests in the field practice area of Urban Health Training Centre (UHTC), Hubli, Karnataka.

## OBJECTIVES

The objective of the study was to estimate the prevalence of RTI/STI among pregnant women in reproductive age group, by using the syndromic case definition and to find the validity of symptom based diagnosis over laboratory diagnosis of RTI.

## MATERIALS AND METHOD

It is a cross-sectional study, conducted for one year, from April 2005 to March 2006.

The sample size was calculated by taking into consideration 19 % of women under 15 – 45 years in urban community, at 95 % Confidence Interval and 3 % permissible error, covering  $\pm 1.96$  under normal curve, the sample size worked out to be 656 with the application of the formula  $[\pm 1.96 \sqrt{pq/n} = \pm 0.03]$ .

This study was undertaken in the field practice area of Urban Health Training Centre, (UHTC), Hubli. All the houses in the urban field practice area were numbered and by using a random number table, the houses were selected on the basis of simple random sampling technique, until 656 reproductive age group women were covered in nearly 520 families.

All women were screened for pregnancy, by doing urine pregnancy test, examination and checking their antenatal card. Among 656 reproductive age group women, the number of recently pregnant women were 78, in different periods of gestation.

A pre-tested structured proforma was used to interview the women, about their antenatal history, socio-demographic, reproductive history, current and past RTI symptoms.

The syndromes related to RTI, like abnormal excessive vaginal discharge, genital ulcer disease, inguinal bubo, lower abdominal pain, lower back ache and pain during urination, as recommended by Government of India, Ministry of Health and Family Welfare, for management of RTIs / STDs were considered.<sup>(7)</sup> All pregnant women were motivated, encouraged after counseling to give samples for laboratory tests for RTI in UHTC. It was taken care, to see that, all the 78 pregnant women attended for investigations with the help of female health workers. Since pregnant women had registered pregnancy in UHTC, they co-operated to the advice of health workers. In the centre, per abdominal/per vaginal/per speculum examination was done. Vaginal and endocervical swabs were taken for 78 pregnant women. Serological test for Syphilis was done for every respondent after written consent and counseling.

Wet mount microscopy of vaginal secretions was done to detect *Trichomonas vaginalis*. Immediately after per speculum examination, the vaginal and endocervical swabs were sent to Microbiology department, Karnataka Institute of Medical Sciences, (KIMS), Hubli, in cold box, Gram stained and inoculated in suitable media like Chocolate agar and Thayer Martin medium for Gonorrhoea and Sabouraud dextrose agar (SDA) media for Candidiasis.

For diagnosis of Bacterial Vaginosis (BV) any three out of four criteria were taken as positive.<sup>(8)</sup>

1. Watery vaginal discharge
2. Vaginal pH more than 4.5 using pH indicator paper
3. Amine odour test positive (odour described as fishy after addition of 10 percent Potassium Hydroxide)
4. Clue cells in Gram's stained vaginal smear under microscopy.

All pregnant women suffering from RTIs were asked further, to get investigated and take free treatment in UHTC.

**ANALYSIS:-** Statistical tests like Proportions, Validity of screening tests like Sensitivity,

Specificity, false negatives, false positives, Positive Predictive value and Predictive value of negative test were used. Data was tabulated on Microsoft excel sheets and analyzed using software SPSS.

## FINDINGS

**Table 1. The prevalence of symptoms among the symptomatic patients and in the Study population**

RTI symptoms	Symptomatic patients n=52(%)	Study population n=78(%)
Abnormal excessive Vaginal discharge	52(100.0)	66.67%
Lower back ache	34(65.4)	43.60%
Lower abdominal pain	18(34.6)	23.17%
Associated fever	10(19.2)	12.8%
Genital ulceration	1(1.9)	1.3%
Inguinal lymphadenopathy	2(3.8)	2.6%
Pain during urination	20(38.5)	25.6%

The present study revealed that 78 women were recently pregnant among the study group, during the study period in different periods of gestation.

The prevalence of RTI in pregnant women were 52(66.6%), based on symptoms, with most common presentation being abnormal vaginal discharge

52(66.6%), lower back ache 34(43.6%), lower abdominal pain 18(23.2%) and pain during urination 20(25.6%). (n=78) [Table 1]. Many of the women had more than one symptom.

**Table 2: Distribution of the clinical diagnosis of RTI among pregnant Symptomatic and Asymptomatic women**

Clinical diagnosis of RTI	Number of symptomatic women (n=52)(%)	Number of Asymptomatic women (n=26)(%)
Vaginitis	23(44.2)	6(23.1)
Genital ulcer	1(1.9)	0(0)
Cervicitis	5(9.6)	3(11.5)
Pelvic Inflammatory Disease	8(15.4)	2(7.7)

Out of 78 pregnant women, 48(61.5%) pregnant women had signs of RTI like vaginitis, cervicitis and signs of Pelvic Inflammatory Disease (PID) on clinical examination. Many of them had more than one clinical sign, with majority having Vaginitis. [Table-2]

Out of 78 pregnant women in the study group, 52 women had symptoms of RTI and 26 women had no symptoms of RTI. Among symptomatics, (n=52), 37(71.2%) women had positive clinical signs and among asymptomatics, (n=26), 11 women (42.3%) had signs of RTI on clinical examination. [Table-2]

Therefore Clinical diagnosis could be made in 37 symptomatic women with RTI/STI. Only vaginitis was diagnosed in 23(44.2%) symptomatic women, PID in 8(15.4%), Cervicitis in 5(9.6%) and Genital ulcer in 1(1.9%) women. (n=52) [Table-2]

In asymptomatic women, vaginitis was found in 6(23.1%), cervicitis in 3(11.5%) and PID in 2(7.7%) women. (n=26) [Table-2]

**Table 3: Distribution of pregnant women according to laboratory diagnosis of RTI**

Clinical diagnosis of RTI	Number of symptomatic women (n=52)(%)	Number of Asymptomatic women (n=26)(%)
Gonorrhoea	0(0)	0(0)
Syphilis	1(1.9)	3(7.7)
Trichomoniasis	3(5.8)	0(0)
Bacterial vaginosis	4(7.7)	1(3.8)
Candidiasis	20(38.5)	8(30.8)

Validity of symptom based diagnosis over laboratory diagnosis

\*Sensitivity=70%, Specificity=36.8%, Positive Predictive Value=53.9%

False negative=30%, False positive=63.2%, Predictive Value of negative test=53.8%

Based on laboratory findings, 40 (51.28%) pregnant women were positive for RTI. (n=78) Among symptomatics, 28(53.9%) women, (n=52) had positive laboratory findings and among asymptomatics, 12 women (46.2%), (n=26) had positive laboratory findings of RTI, with majority of women having Candidiasis. [Table-3]

Among symptomatics, Candidiasis was detected in 38.5% cases and Bacterial Vaginosis in 7.7% cases, Trichomoniasis was diagnosed in 5.8% cases, Syphilis in 1.9% cases and Gonorrhoea in 0% cases.

In women without RTI/STI symptoms, Candidiasis was diagnosed in 30.8%, Syphilis in 7.7% and Bacterial Vaginosis in 3.8% of women, (n=26). Trichomoniasis was not detected in any of the study subjects. Syndromic diagnosis, based on symptoms was confirmed with laboratory procedures in 28 cases out of total 52 cases, which is 53.9%. The Sensitivity of symptom based diagnosis over laboratory diagnosis of RTI was 70%, Specificity was 36.8% and Positive Predictive Value was 53.9%.

## DISCUSSION

From this study, the prevalence of RTI among pregnant women was 66.6% based on only the symptoms. It was observed that majority of women 52 (66.6%) complained of abnormal excessive vaginal discharge followed by lower back ache 34 (43.6%). (n=78)

This study is in accordance to Maitra.K.et.al. where one fourth of pregnant women with RTI had abnormal vaginal discharge followed by pain during urination. (9)

On clinical examination, majority had vaginitis, seen in 29(37%) pregnant women. Many of them had more than one clinical sign. This is in accordance to M Romoren et al study, where majority of pregnant women had vaginitis. (10)

In the present study, among symptomatics, Candidiasis was detected in 38.5% cases and Bacterial Vaginosis in 7.7% cases. Trichomoniasis was found in 5.8% cases and Syphilis in 1.9% cases. In women without RTI/STI symptoms, Candidiasis was diagnosed in 30.8%, Syphilis in 7.7% and Bacterial Vaginosis in 3.8% of women. Other organisms could not be diagnosed due to limited diagnostic facilities in the field conditions.

In a similar study conducted by M Romoren et al, Trichomoniasis was detected in 19% cases in pregnant women, while Bacterial Vaginosis was found in 38% of the cases. Also three fourths of pregnant

women with Trichomoniasis and Bacterial Vaginosis were asymptomatic.<sup>(10)</sup>

Similarly, study conducted by Blankhart D et al, confirmed that 34% of pregnant women in the study group had RTI/STI, in which majority 46.6% had Candidiasis, 29.1% with Bacterial Vaginosis, 9.9% with Trichomoniasis, Syphilis 6.7% and Gonorrhoea in 3.1% of them.<sup>(11)</sup>

A study conducted by Chen XS et al, among pregnant women attending antenatal clinic showed 3.2% of them had Trichomoniasis, Gonorrhoea in 0.8%, and Syphilis in 0.2%. Almost 73% of women with STI were asymptomatic.<sup>(12)</sup>

### CONCLUSION

RTI/STI poses to be an important morbidity in pregnant women. All causative agents causing RTI/STI could not be confirmed, due to limited diagnostic facilities in the health centre. Hence organisms, which can be detected by feasible tests were diagnosed.

Syndromic diagnosis based on symptoms was confirmed with laboratory procedures which is 53.9% of the cases. All pregnant women coming with contact of the health care facility should be screened for RTI/STI through syndromic approach and further confirmed by laboratory tests.

Hence the study highlights the need for community based studies requiring laboratory investigations with feasible tests, to necessitate proper prevention and control measures.

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# A Cross Sectional Study to Evaluate the Fitness Pattern among the Young Fishermen of Coastal Orissa

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## ABSTRACT

Health related physical fitness of an individual is mainly dependent on lifestyle related factors such as daily physical activity levels. Thus a cross sectional study was carried out to predict the influence of such a physically demanding occupation, fishery, on physical fitness. 15 male young fishermen of Puri District, Orissa, India (mean age 22.2) and the 15 young college students (mean age 21.9) who served as 'controls', were recruited by simple random sampling. Some common physical parameters and fitness variables are measured, of which a significant difference ( $p < 0.05$ ) was observed in blood pressure, PFI, energy expenditure, body fat% and anaerobic power, whereas, BSA, BMI, resting heart rate, V.O<sub>2</sub> max, upper arm, thigh and calf circumferences were found to be non-significant. From the present study it can be concluded that fishermen have more physical or cardiovascular fitness and muscle mass, but less fat percentage.

**Keywords:** Fishermen, Physical Fitness, Body Fat, Anaerobic Power, V.O<sub>2</sub>max, Harvard Step Test, Orissa, Coastal Area, Waist-to-Hip Ratio.

## INTRODUCTION

The state of Orissa is situated in the northeastern part of the Indian peninsula with a coastline of 480 kilometers, about 8 percent of the coastline of India. It is bounded by the Bay of Bengal to the east and the states of West Bengal to the northeast, Jharkhand to north, Chhattisgarh to west and Andhra Pradesh to south<sup>1</sup>. Bhubaneswar is the capital of the state with a population of 657,500<sup>2</sup>, and Cuttack, Puri (largest fishing settlement in the state), Berhampur, Sambalpur, Balasore and Rourkela are the other important towns in the state. In this state fishery is one of the major occupations of people residing in coastal areas. Fishery is also considered as one of the bright and prosperous industry in India<sup>3</sup>. More than 3 lacs of families are involved in fishing which includes more than 2.1 million fishers in India; and among them more than 1.2 lacs fishers resides in coastal Orissa<sup>4</sup>. Their occupation demands a better physical fitness, but the health status and physical fitness data about fishermen of India is scanty. It is well recognized that physical fitness not only refers cardiorespiratory fitness and muscular strength, but also integrated measurement of all functions and structures involved in the performance<sup>5</sup>. In adults, low physical fitness or cardiorespiratory fitness seems to be a stronger predictor of both cardiovascular and all-cause mortality than any other well established risk factors<sup>6</sup>. To a large extent, habitual physical activity levels among workers vary depending

on the type of work performed. When the work is not of a sedentary nature, a large proportion of habitual physical activity is performed at the workplace<sup>7</sup>. Such a type of job has been performed by the fishermen who need excellent muscular strength and better cardiovascular fitness in their occupation. Thus the present investigation has been undertaken to determine the influence of such occupational physical work load on physical fitness.

## METHOD AND MATERIAL

### SELECTION OF SUBJECTS

Two distinctly different groups of 15 non-smoker male subjects between 18-25 years of age are randomly selected to participate in the present study. Fishermen group consists of young fishermen (age of  $22.2 \pm 2.70$ ) selected randomly from fishermen slum of Puri, Orissa, India; and the Control group consists of college students (age of  $21.9 \pm 2.25$ ).

### MEASUREMENT OF PHYSICAL PARAMETERS

#### • BODY MASS INDEX (B.M.I.)

The body mass index (or *Quetelet Index*) is the statistical measure which compares a one's weight and height by the following formula<sup>8,9</sup>:

$$\text{BMI} = \text{mass (kg)} / (\text{Height in m})^2$$

The WHO<sup>10</sup> regard a BMI of less than 18.5 as underweight and may indicate malnutrition, an eating disorder, or other health problems, while a BMI greater than 25 is considered overweight and above 30 is considered obese.

#### • Body Fat % Measurement

Body fat can be estimated from the Body mass index (BMI). There is a linear relationship between densitometrically-determined body fat percentage (BF %) and BMI, taking age and gender into account. Based on which following prediction formulas have been derived which showed a valid estimates of body fat at all ages, in males and females. But, in obese subjects the prediction formulas are slightly overestimated. The prediction error is comparable with other methods of estimating BF%, such as skinfold thickness measurements or bioelectrical impedance<sup>11, 12, 13</sup>.

**Adult Body Fat % = (1.20 x BMI) + (0.23 x Age) - (10.8 x gender) - 5.4**

Gender values for male = 1, female = 0

#### • Body Surface Area (BSA)

In Physiology, the body surface area (BSA) is the measured or calculated surface of a human body. Various calculations have been published to arrive at the BSA without direct measurement. Dubois & Dubois formula was used for estimating body surface area (BSA)<sup>14</sup>.

#### Measurement of Resting Heart Rate and Blood Pressure

Baseline HR was obtained after five minutes rest in the sitting position. The resting heart beat was measured at carotid pulse. When two successive heart rate scores become equal then it was considered as resting heart rate<sup>15</sup>. Arterial pressure is most commonly measured by a sphygmomanometer<sup>16</sup>. BP values were obtained after five minutes rest in the sitting position<sup>17</sup>.

#### Determination of Physical Fitness Index (PFI)

PFI was calculated by measuring heart rate after performing Harvard step test (HST) developed by Brouha et al. in the Harvard Fatigue Laboratories using long form PFI equation<sup>18</sup>. But, following modified HST under Indian condition, using stool of 51 cm high stepping up and down with a rate of 30 cycles/ min for 3 minutes or up to exhaustion. Exhaustion is defined as when the subject cannot maintain the stepping rate for 15 seconds<sup>19, 20</sup>. The recovery pulse was counted at 1 to 1.5, 2 to 2.5 and 3 to 3.5 minutes of recovery.

$$\text{Long Form Equation - Fitness Index} = \frac{100}{2 \times \text{Recovery heart rates (1 to 1.5 mins + 2 to 2.5 mins + 3 to 3.5 mins)}} \times \text{Test duration in seconds}$$

#### Determination of Anaerobic Power By Margaria Doubles Step Test

It is a short-term anaerobic test or power test in which the subject taking two steps at a time, the height of the stairs are measured by measuring tape. To calculate the anaerobic power; the height of ascend, the body weight, and the duration (sec) is noted by the stopwatch<sup>21</sup>. At first the work done is calculated by the following formulae:

$$\text{Work done} = \text{body weight} \times \text{height of ascend} \times 0.002342$$

From the calculated result of work done, the anaerobic power was calculated by the following formulae:

$$\text{Anaerobic power} = \frac{\text{Work Done (Kg/mitre)}}{\text{duration (sec)}}$$

The unit of anaerobic power is expressed as kg/meter/sec

#### Determination of Aerobic Capacity (V O<sub>2</sub> max)

It can be defined as the maximum amount of O<sub>2</sub> consumed during rhythmic dynamic progressively increasing exercise done by any kind of ergometer (treadmill, stationary bicycle ergometer, hand cranking etc.) at sea level under thermally neutral condition when more muscle mass recruited then capacity of O<sub>2</sub> is increased.

Here the Nomogram of Astrand was used to determinate the VO<sub>2</sub> max<sup>22</sup>.

#### Estimation of Energy Expenditure (EE)

Energy expenditure for any kind of job is normally measured by different calorimetric methods. It is also determined by many predictive equations. The following formula has been used for this study<sup>23</sup>.

$$\text{EE (Kcal min}^{-2}) = -1.42 + (0.045 \times \text{peak H.R})$$

#### ANTHROPOMETRIC MEASURES

Curvilinear distances (circumferences) taken around the midpoint of upper arm (UAC), neck (NC), mid-thigh (TC), calf muscle of leg (CC), waist (WC) and buttock (BC). WC and BC are used to predict the body fat content. UAC is an index of body Energy store and protein mass. Sometime it is combined with skin fold thickness to

calculate the areas of arm muscle and adipose tissue. TC indicates muscle atrophy due to disease or atrophy and CC provides an estimate of cross-sectional and adipose tissue areas of calf<sup>24</sup>.

### STATISTICAL ANALYSIS

Data are expressed as mean ± SD. Comparison of parameters between control and fishermen was done by two tailed unpaired t-test, using Microsoft Excel-2007 and the result was considered as significant when the two-tailed P value <0.05<sup>25</sup>.

### RESULTS

The height (cm) and body weight (kg) of 15 control subjects are 164.6 ± 7.21 and 59.3 ± 7.5 (mean± SD) respectively; and those of 15 fishermen are 159.3 ± 5.40 and 54.3± 10.2 (mean± SD) respectively. Results are represented in Table 1 to Table 3. Other than BF% no significant differences were found in the physical parameters between two groups. Physical fitness index (PFI) score reveals that young fishermen have excellent physical fitness level (Table 1).

**TABLE 1. Physical Parameters and Physical Fitness variables.**

	Control	Fishermen	P
<b>Physical Parameters</b>			
• BMI (Kg/m <sup>2</sup> )	21.7±1.93	21.0±1.20	0.102
• Body Fat %	20.5±1.73	18.0±2.04*	0.054
• BSA (m <sup>2</sup> )	1.68±0.08	1.59±0.12	0.507
<b>Physical Fitness Variables</b>			
• Resting Heart Rate (Beats/min)	76.2±8.10	74.1±6.03	0.522
• Systolic Blood Pressure (mm Hg )	123.0±4.62	126.6±5.01 <sup>†</sup>	0.001
• Diastolic Blood Pressure (mm Hg)	84.1±6.84	76.2±6.21	0.102
• PFI	69.9±4.80	87.0±7.02 <sup>†</sup>	0.002

Values are mean± SD, (sample size=n<sub>1</sub>=n<sub>2</sub>=15). Superscript (\*) indicates significant difference by two tail unpaired t-test (for equal variances) at P<0.05.

Fishermen showed a greater anaerobic power, but less energy expenditure than control subjects. They showed no significant difference in V<sub>O</sub><sub>2</sub>max (Table 2).

**TABLE 2. Assessment of anaerobic power, V<sub>E</sub>O<sub>2</sub> max and Energy expenditure of Fishermen.**

	Control	Fishermen	P
Anaerobic power (kg.m <sup>-1</sup> .sec <sup>-1</sup> )	12.3±2.46	14.4±2.40 <sup>†</sup>	0.057
V <sub>O</sub> <sub>2</sub> max (liters.min <sup>-1</sup> )	3.12±0.33	3.21±0.51	0.099
Energy expenditure (K.Cal. min <sup>-2</sup> )	5.67±0.57	4.41±0.72 <sup>†</sup>	0.002

Values denote mean± SD, (sample size=n<sub>1</sub>=n<sub>2</sub>=15). Superscript (†) indicates significant difference by two tail unpaired t-test (for equal variances) at P<0.05.

Anthropometric measures of both groups which may affect fitness pattern. But these parameters showed no significant difference with control subjects (Table 3).

**TABLE 3. Anthropometric Measures.**

Group	Control	Fishermen
Upper Arm Circumference (cm)	27.0±4.11	29.1±3.00
Thigh Circumference (cm)	47.1±5.55	46.2±4.20
Calf Circumference (cm)	32.1±3.78	33.0±4.05
Neck Circumference (cm)	40.2±1.26	39.3±1.08
Waist Circumference (cm)	75.9±4.53	72.6±5.52
Buttock Circumference (cm)	81.3±6.03	76.2±4.11
Waist-to-Height ratio	0.48±0.01	0.46±0.01

Values denote mean± SD, (sample size=n<sub>1</sub>=n<sub>2</sub>= 15). Values are not significantly different by two tail unpaired t-test (for equal variances) at P<0.05.

## DISCUSSION

In Orissa more than 55 percent of people are reported to be underweight<sup>26</sup>, but, the data of physical parameters (BMI, BSA) of the present study shows there is no significant difference between two groups. But, body fat percentage of young fishermen was found to be less than sedentary population (Table 1) which could be due to the influence of their physically demanding occupation on their health.

Resting heart rate and Aerobic capacity or maximum oxygen uptake capacity ( $V\cdot O_2\max$ ) are widely considered to be reliable and valid measure of cardio-respiratory fitness<sup>27</sup>. Since fishermen usually perform work related to muscular strength, no significant change was found in these parameters. Strength exercise increases ventricular muscle mass<sup>28</sup> which results in increased force of contraction and hence cardiac output which may be the cause significant increase of blood pressure. As they are habituated to do this job, i.e. they perform heavy muscular work regularly; their pulse rate recovered quickly which is an indicator of better fitness which is reflected in significantly higher PFI (Table 1) and lower Energy Expenditure and they also have better anaerobic power than sedentary workers (Table 2) which is similar to some other reports<sup>29,30</sup>.

As young fishermen perform strenuous work, so they supposed to have more UAC than control subjects which is an estimate of energy store and protein mass of the body and also an indirect measure of strength, but no significant difference was observed in upper arm circumference between two groups (Table 3). NC also showed no significant difference. Waist-to-hip ratio which is a less common parameter of estimating body fat in men<sup>31</sup> is found to be insignificant in fishermen than control subjects, which is caused by their poor nutritional status, which again attributable to their economic condition<sup>32</sup>. Because people below the poverty line is about 14.3 million or 48 % of the population in the rural areas, and 2.5 million or 43 % in urban areas, taking the total number of poor below the poverty line in the state to 17 million, or 47.15% of the population<sup>33</sup>. Among these 163639 families below poverty line resides in Puri District which resembles 69% of rural population. Similarly, no significant difference was also found in TC and CC between two groups (Table 3).

## CONCLUSION

It can be concluded from the present study that physically demanding job of fishermen is positively

related with their PFI, energy expenditure and anaerobic power. But along with strength, more endurance is required for better health and fitness.

## ABBREVIATIONS

PFI	Physical Fitness Index
HST	Harvard Step Test
BSA	Body Surface Area
BMI	Body Mass Index
BF%	Body Fat Percentage
SDA	Specific Dynamic Action
$V\cdot O_2\max$	Maximal Aerobic Capacity
EE	Energy Expenditure
UAC	Upper Arm Circumference
NC	Neck Circumference
WC	Waist Circumference
BC	Buttock Circumference
TC	Thigh Circumference
CC	Calf Circumference

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## Conflict of Interest

Authors declare that they do not have any conflict of interest about the publication of this article.

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# Smokeless Tobacco - An Inferno Without Smoke- A Case Series

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## ABSTRACT

Tobacco use for years has been acknowledged as a filthy habit, a corrupting addiction, and the greatest disease-producing product known to man and has been associated with oral cancer over the decades. Smokeless tobacco comes in two forms: chewing tobacco and snuff. Though it does not produce heat as compared to that produced by smoking forms of tobacco, its ill effects are no less. Addicts get a continuous or an instant "high" depending on the type of product they are using because of the nicotine present in it. Various nuclear products, pesticides and carcinogens are used in its production. To eradicate this health hazard from within our society a keen determination, awareness, education by dental specialists and cooperation from the government organizations is the need of the hour.

**Keywords:** *Chewing tobacco, snuff, Tobacco Specific Nitrosamines (TSNs), squamous cell carcinoma, bupropion hydrochloride*

## INTRODUCTION

Smokeless tobacco (SLT) also known as spit tobacco has gained importance in the last two decades, affecting millions of people predominantly in the developing countries more so amongst American and Asian adolescents and athletes. In India, among the school children placed in the age group of 15 years, tobacco use varies from 3.3% in Goa and 62.8% in Nagaland. Although the proportion of the population that smokes has been steadily declining over the past 25 years, consumption of chewing tobacco leaves (in cut form, with or without lime) has been increasing dramatically. As the world's largest democracy, the second largest tobacco user and producer and its position on the Tobacco World map is significant. It has both direct and indirect effects on the body system, damaging the immune system hence crippling the human body and mind and affecting Activities of Daily Living (ADL). It also noted that studies of the effects of smokeless tobacco use on gingival and periodontal tissues have resulted in equivocal findings and that negative health effects on the teeth from SLT use are suspected but unconfirmed<sup>1</sup>.

## HISTORY

Tobacco was introduced in Europe in the late 15<sup>th</sup> century. Sometime in the late 16<sup>th</sup> or 17<sup>th</sup> century Portuguese traders introduced it into India. Initially tobacco was smoked in India but later it was used for

chewing and application over the teeth and the gingiva as well (smokeless tobacco). It was as not until 1761, however, that any scientific observations were made about chewing tobacco and its effects on health. Despite all evidences of the ill effects of SLT no epidemiological study was done on the substance until 1979.

## TYPES

There are two forms of SLT: "chewing tobacco" and "snuff". Chewing tobacco is usually sold as leaf tobacco (packaged in a pouch), plug tobacco (in brick form) or twists. They are placed between the cheek and gum. Snuff is a powdered tobacco (usually sold in cans) available in dry form (sniffed through nose) and moist form (finely ground/cut tobacco used by dipping) that is put between the lower lip and the gum. Gutkha, pan, mawa, mainpuri tobacco, khaini, zarda, naswar, shammah, toombak are chewable forms of tobacco whereas mishri, gudhaku, bajjar are applied on gums and teeth.

## CONSTITUENTS

The main constituents of SLT are: Nicotine (addictive drug), N-Nitrosamines (cancer-causing), Cyanide (poisonous compound), Arsenic (poisonous metallic element), Benzene (used in insecticides and motor fuels). Research studies have determined that there are other possible carcinogenic agents in SLT products, among the most important of which are cadmium, lead,

polonium-210, benzo(a)pyrene, and formaldehyde<sup>2</sup>. The tobacco specific nitrosamines (TSNs) N-nitrosonor-nicotine (NNN), Nitrosopyrrolidine (NPYR) and 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone (NNK) have been detected in SLT. The other chemicals found are nickel, pesticides, acetaldehyde, benzopyrene, hydrazine, uranium 235, uranium 238 and twenty eight other carcinogens.

### MECHANISM

With the chemical symbol  $C_{10}H_{14}N_2$ , nicotine is an alkaloid derived from pyridine, a carcinogenic poison that occurs naturally in coal tar. The drug works through the central nervous system, binding with nicotinic receptors located in the brain's dopaminergic neurons (dopamine-sensitive nerve cells), causing the neurons to release more dopamine which is the key to why tobacco is so addictive. It regulates mood and pleasure, both serving as a trigger for the synthesis of adrenaline and noradrenaline and acting as a neurotransmitter. Hence nicotine goes to the brain; it produces a rush of dopamine into the bloodstream, causing the user to become more relaxed and calm.

### DIAGNOSIS

Early symptoms of oral cancer may appear as a white or red patch of tissue in the mouth, or a small indurated ulcer which looks like a common canker sore. Because there are so many benign tissue changes that occur normally in the mouth, a bite on the inside of the cheek may mimic the look of a dangerous tissue change, it is important to have any sore or discolored area of the mouth, which does not heal within 14 days, looked at by a professional. Other symptoms include; a lump or mass which can be felt inside the mouth or neck, pain or difficulty in swallowing, speaking, or chewing, any wart like masses, hoarseness which lasts for a long time, or any numbness in the oral/facial region

### ILL ORAL EFFECTS

The most immediate effects can disrupt your social life, i.e. it causes bad breath and yellowish-brown stains on your teeth (CASE1). It also precipitates cracking and bleeding of lips and gums. The incidence of bleeding gums was significantly higher in quid-chewers than in non chewers, and chewers (58.3%) had halitosis<sup>3</sup>. Dental problems associated with consumption of SLT are tooth abrasion, sensitivity, hyper-keratinization of soft tissues, loss of attachment, recession (CASE 2) which can eventually lead to mobility and gingivitis progressing to periodontitis. Betel nut chewing and SLT produce similar risk to cancer incidence as tobacco smoking<sup>4</sup> (CASE 3). In studies of the hamster cheek pouch, Stich et al. showed that snuff enhanced

significantly herpes simplex virus-associated development of microinvasive squamous cell carcinomas in the cheek pouch epithelium<sup>5</sup>. According to a WHO estimate 5 million people die of tobacco related deaths every year. By 2030, it is estimated that number of premature deaths attributed to tobacco would double to 10 million deaths per year, with 7 million deaths taking place in developing countries (CASE 4,5 & 6). All adults who use SLT are 2.1 times more likely to have interproximal severe active periodontal disease<sup>6</sup>. Pooling of carcinogens in saliva gives cancers in the "gutter" area floor of the mouth and ventral and lateral tongue and buccal vestibule<sup>7</sup>. The degree of clinical alteration depends on the type and quantity of tobacco, the duration of tobacco usage, and host susceptibility<sup>8</sup>.



Fig. 1. A patient aged 45 years came to the OPD of Sardar Patel Dental College with the chief complaint of receding gums in the lower incisor region accompanied with sensitivity of teeth. History revealed habit of chewing tobacco for last 15 years and placing tobacco in the mandibular anterior vestibule.



Fig. 2. Patient aged 35 years reported to OPD of Sardar Patel Dental College with the chief complaint of burning sensation in both right and left buccal mucosa along with halitosis. On examination there was calculus deposition and gingival severe recession in lower anterior region.

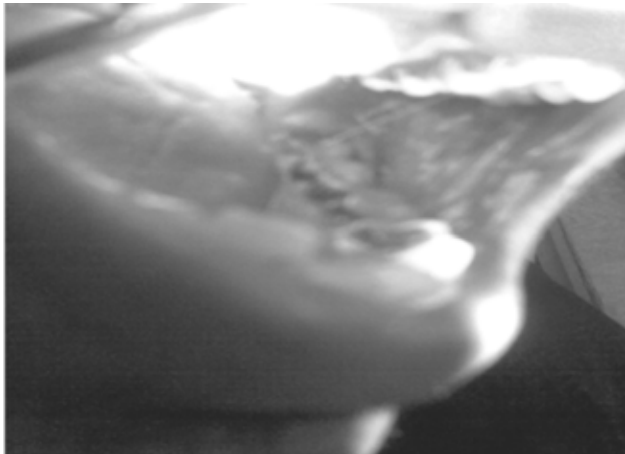


Fig. 3. A male patient aged 40 years presented with white patches and striations in the left buccal vestibule. History revealed habit of areca nut chewing since childhood.



Fig. 4. A male patient aged 28 years had problems of limited mouth opening & difficulty in proper mastication. There was loss of taste & sensitivity to spices. History revealed habit of pan masala chewing since school age.



Fig. 5. Patient aged 51 years suffering from squamous cell carcinoma of buccal mucosa for last 9 months was referred from SGPGI, Lucknow for oral prophylaxis as patient has to undergo a surgical excision.



Fig. 6. 28 year old male suffering from Oral Sub Mucous Fibrosis and operated upon for carcinoma of floor of mouth referred from SGPGI, Lucknow, for oral prophylaxis as the patient had to undergo the radiotherapy.

## TREATMENT

Treatment of oral cancers related to use of SLT is ideally a multidisciplinary approach involving the efforts of surgeons, radiation oncologists, chemotherapy oncologists, counseling by dental practitioners, nutritionists, and rehabilitation and restorative specialists along with strong determination of the patient for discontinuation of the habit. The actual curative treatment modalities are usually chemotherapy with concurrent radiation, sometimes combined with surgery.

Non-surgical treatment strategies include nicotine replacement strategies i.e. nicotine containing gums, nicotine containing lozenges, nasal sprays, nicotine inhalers and nicotine releasing patches. Allopathic medication includes- Zyban (Bupropion hydrochloride 150 mg qd x 3 days then bid, quit after 1 week and then continue for 3 months) which will dramatically reduce withdrawal symptoms.

## CONCLUSION

The ill effects of SLT are no less than smoking tobacco and its increasing prevalence amongst adolescents is an area of major concern for us. Unfortunately, SLT does not mean harmless pleasure. A major change in government regulations, advertisements of SLT products and self control needs to be incorporated into our social network.

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# Postmenopausal Bleeding: A Warning Symptom

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## ABSTRACT

**Objective:** Pathological evaluation of postmenopausal bleeding.

**Settings:** Department of Obstetrics & Gynaecology, Pt. J. N. M. Medical college & DR. B. R. Ambedkar Memorial, Hospital, Raipur(C. G.)

**Study design:** Cross sectional

**Participants:** 100

**Material and Methods:** A detailed, pre-tested, structured, closed questionnaire was used to collect the data. According to the case, cervical cytology and biopsy from any suspicious lesion or growth from cervix, vagina or vulva was taken. Results were analyzed using percentages.

**Results:** 65% of cases were of malignant origin. Carcinoma cervix came out to be the most common malignancy causing postmenopausal bleeding, representing 60% of total cases. Most of the cancer cervix cases were in advanced stages. Carcinoma endometrium and Carcinoma vulva were other malignancies found. The most common benign lesion associated with postmenopausal bleeding was Cervical Polyp, responsible for 25.7% of all benign cases. Incidence of malignancy increased with increasing age and with increasing clear span.

**Conclusions:** There is an urgent need for increasing awareness about the importance of postmenopausal bleeding. It is imperative to maintain a high index of suspicion and evaluate postmenopausal bleeding thoroughly considering its malignancy unless proved otherwise. Emphasis should be placed on screening of carcinoma cervix in pre-invasive stage, when it is symptomless and curable.

**Keywords:** Postmenopausal Bleeding, Cancer, Cervical Cancer

## INTRODUCTION

The menopause applies to the permanent cessation of menstruation due to loss of ovarian activity. It is a retrospective term. A woman is considered menopausal after twelve months of amenorrhoea. Vaginal bleeding any time after 12 months of amenorrhoea in a woman of menopausal age, is known as postmenopausal bleeding<sup>1,2,3</sup> or after 6 months of amenorrhoea according to some.<sup>4,5,6</sup> There are a variety of causes for postmenopausal bleeding but the most feared ones are the genital malignancies. Early reporting and proper investigation of postmenopausal bleeding can lead to a better outcome. In present study we made an attempt to find out different causes of postmenopausal bleeding in this region with an emphasis on malignant ones. There are many benign causes of postmenopausal bleeding, most of which are easily curable, but

pathologic studies<sup>7,8,9</sup> indicate that the only safe assumption is that malignancy is responsible for the bleeding until unequivocally proved otherwise.

## OBJECTIVES

- To note the different causes of postmenopausal bleeding
- To find out incidence and type of malignancies in cases of PMB in this region

## MATERIAL AND METHOD

The cases in present study were the women of menopausal age with vaginal bleeding or blood stained vaginal discharge at any time after 12 months of amenorrhoea, who attended the Department of Obstetrics and Gynaecology, Dr. B.R.A.M. Hospital,

Raipur (C.G.). Ethical approval was obtained. The study continued for one year. 100 cases were studied and a record was maintained. After taking a detailed history, thorough examination was done in each case. According to the case, cervical cytology and biopsy from any suspicious lesion or growth from cervix, vagina or vulva was taken. In every possible case endometrial tissue for biopsy was sent. Pelvic imaging was performed according to the case. The collected data was put in the master chart. Results were analyzed by using percentages.

**RESULTS**

4111 women attended Gyneacology OPD during the study period, out of which 146 patients of menopausal age came with the complaint of postmenopausal bleeding. 46 cases lost to follow up. Only 100 cases got fully investigated and were included in our study.

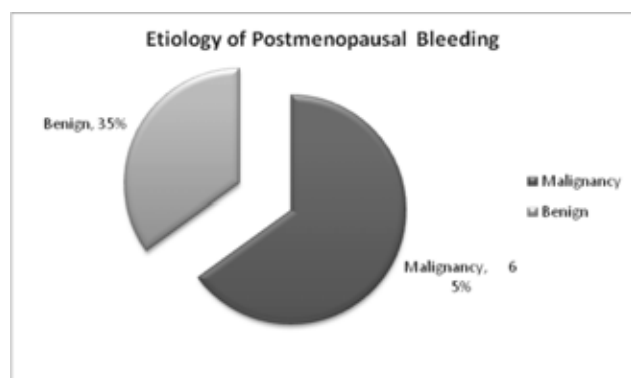


Fig. No. 1

Fig.1 shows that 65% of cases were of malignant origin which is quiet alarming. Rest of the cases were benign.

**Table 1. Different Malignant Causes of Postmenopausal bleeding**

S. No.	Malignancy	No. of Cases	Percentage(%)
1	Ca Endometrium	3	4.6
2	Ca Cervix	60	92.3
3	Ca Ovary	-	-
4	Ca Vagina	-	-
5	Ca Vulva	2	3

Carcinoma cervix was found to be the most common malignancy causing postmenopausal bleeding in this region, representing, 60% of total cases and 92.3% of total malignancies (Table No.1), Carcinoma endometrium and carcinoma vulva were other malignancies found. Carcinoma endometrium found in 4.6% of total cases.

**Table2. Different Benign Lesions in Cases of Postmenopausal Bleeding**

S. No.	Benign Conditions	No. of cases	Percentage (%)
1	Endometrial Hyperplasia	4	11
2	Atrophic Endometrium	5	14.3
3	Fibroid Uterus	1	2.8
4	Adenomyosis	1	2.8
5	Forgotten Lippe's loop	1	2.8
6	Cervical Polyp	9	25.7
7	Chronic Cervicitis	4	11.4
8	Cervical Erosion	5	14.3
9	Atrophic Vaginitis	4	11.4
10	Benign Ovarian Cyst	1	2.8
Total		35	100

The most common benign lesion associated with postmenopausal bleeding was cervical polyp, responsible for 25.7% of all benign cases (Table No. 2). Other common benign pathologies were atrophic endometrium and cervical erosions.

Fig. 2 shows that the frequency (percentage) of malignancy was gradually increased as the age advanced. Malignancy was found in 54% of total cases in the age group of 45 to 54yrs, whereas it was 72% in 55-64yrs and 77% in 65-74yrs age group. After the age of 75yrs all cases were of malignant origin.

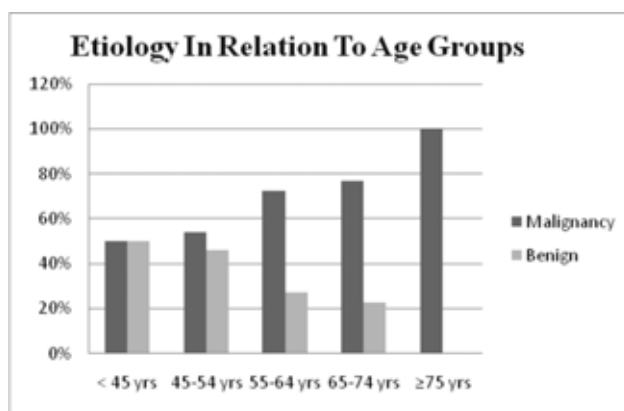


Fig. No. 2

In the study 86% of cases presented with scanty bleeding out of which 69% found to harbour malignancy whereas 42% of cases with profuse bleeding had malignancy (Table No. 3).

**Table 3. Malignancy In Relation To Type of Bleeding**

S.No.	Type of Bleeding	No. of Cases	Malignant	Benign
1	Profuse	14	6 (42.8%)	8 (57.1%)
2	Scanty	86	59 (68.6%)	27 (31.4%)

The incidence of malignancy found to be gradually increasing as the clear span (interval between menopause and the first appearance of vaginal bleeding) increased. Fig.3 shows that the incidence of malignancy was 50% in cases who bled within 5yrs of menopause, rising to 60% in 5-9yrs group, 80% in 10-14yrs group, 83% in 15-19yrs group and 100% in 20yrs and over group.

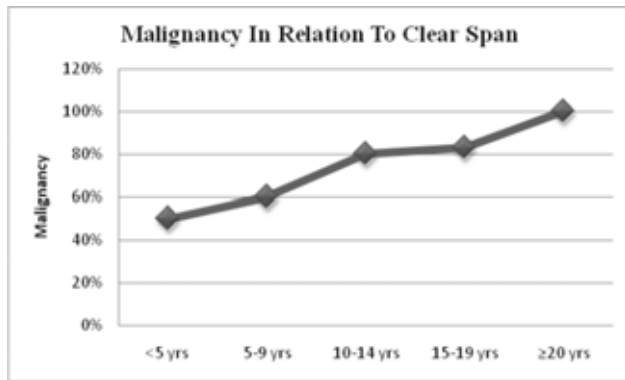


Fig. No. 3

Table No.4 indicates that 92% of Ca Cervix cases were inoperable (Stage 2B and Stage 3B made 38% and 42% respectively of total cancer cervix cases).

Table 4. Cervical Cancer Staging in Cases of PMB

S. No.	Stage	No. of Cases	Percentage %
1	I A	-	-
2	I B	5	8.3
3	II A	-	-
4	II B	23	38.3
5	III A	4	6.7
6	III B	25	41.7
7	IV A	3	5
8	IV B	-	-

### DISCUSSION

In our study incidence of malignancy in cases of PMB was 65%. While most of the earlier work showed an incidence of malignancy to be between 57% to 63%,<sup>3,10,11</sup> most of the recent series state its incidence lower than 35%.<sup>12,13</sup> More recent prevalence from developed countries has been quoted to be around 9.9%<sup>14,15,16</sup> to 11%.<sup>17</sup>

Although the inconsistent use of terminology as well as differing geographical, racial and ethnic factors and the different characters of the hospitals make any comparison of the incidence of malignancy, seen in various reports, difficult to interpret, still the contrast between the earlier and the more recent reports from all over the world is too obvious. Several reasons can be

suggested for this apparent decrease in the incidence of malignant conditions as a cause of PMB, including the widespread use of estrogens, but this decline is largely a reflection of an increased interest in and the facilities for early diagnosis of malignant diseases, especially cervical carcinoma. An increased awareness of the serious implications of bleeding on the part of laity and their medical attendants has also played an important role.<sup>18</sup> More postmenopausal women than formerly are being investigated for the cause of bleeding resulting in a relative increase in the incidence of benign conditions.

65% incidence of malignancy found in our study is comparable to its 63.6% incidence reported in an Indian study by Panda et al<sup>8</sup> and 54% in an African study.<sup>19</sup> Reported incidences from other developing countries are 60.8%<sup>20</sup>, 53.7%<sup>21</sup> and 44%<sup>22</sup>. These results reflect the lack of awareness along with lack of facilities for early diagnosis of malignant diseases in these developing countries. It is recommended that a one-stop clinic be established as it is effective for early diagnosis of genital tract malignancy in majority of patients with PMB and which can significantly help in reducing the hospital waiting list.<sup>23</sup>

The probability of malignancy as underlying cause increased with increasing age (Fig. 2). Similar results reported by Keirse<sup>7</sup> and Gredmark T et al.<sup>17</sup>

In our study 86% of patients presented with scanty bleeding (Table No.3). The incidence of malignancy was 68.6% in these cases whereas it was 42.8% in cases with profuse bleeding. Though the malignancy seemed more frequent in patients with scanty bleeding but the incidence of malignancy is also quiet high in cases with profuse bleeding, concluding that type of bleeding has no significance in determining the etiology. Hence any postmenopausal bleeding, regardless of the amount, single episode or of prolonged periods, whatsoever, does not deny the existence of malignancy and should not deter one from demanding a complete study.<sup>9</sup>

We found cancer cervix to be the most common malignancy causing PMB, representing 60% of total cases. Carcinoma endometrium found in 4.6% of cases (7% by Lidor<sup>24</sup> and 8% by Gredmark<sup>17</sup>), resulting in a ratio between Carcinoma endometrium and Carcinoma cervix of 1:20 which is in contrast to studies by Procoppe<sup>25</sup> (1:1) and by Keirse<sup>7</sup> (1.6:1). Rai L (2001)<sup>26</sup> reported its ratio to be 1:10 in India. Study from India by Panda et al<sup>8</sup> indicates cancer cervix as a cause of

PMB in 53% of total cases comparable to its 60% incidence in our study. This high frequency of cancer cervix in is attributed to high prevalence of undiagnosed cervical malignancy in this region of underdeveloped country. Effective methods for screening and diagnosis of cervical neoplasia and its precursor lesions have effectively eliminated it as a significant cause of PMB in developed countries, but we are still too far from that situation.

Benign lesions as a cause of PMB were found in 35% of cases (Table No.2) consistent with reported incidence by Ghazi et al<sup>27</sup> and much lower than the reported incidence in developed countries.<sup>14-16</sup> We found cervical polyp to be the commonest in benign causes whereas many has reported atrophic endometrium as the most common cause.<sup>9,24,28</sup>

In this study 42% of cases presented within 5 yrs of their menopause. We encountered malignancy, underlying the bleeding more often as the postmenopausal year span increased (Fig.No.3) consistent with Lidor et al.<sup>24</sup> In cases of cancer cervix, bleeding may occur early but too often, it is delayed and an extensive lesion is present before there is sufficient bleeding to attract woman's attention. Consequently we found most of the cases in stage II B and III B (Table No.4), when they were inoperable.

### CONCLUSION

Postmenopausal bleeding is a symptom not to be underestimated. PMB how much slight may be justifies a thorough evaluation of patients considering it malignant until proved otherwise. There is an urgent need for increasing awareness about the importance of postmenopausal bleeding at community level.

Cancer cervix, in its advanced stages, is the major cause of PMB. Hence it is imperative to maintain a high index of suspicion. Emphasis should be placed on screening of carcinoma cervix in pre-invasive stage, when it is symptomless and curable. Strategy for population screening needs to be properly implemented.

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# A Study of Dexmedetomidine Compared with Midazolam for Sedation in Endoscopic Dacryocystorhinostomy

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## ABSTRACT

**Purpose:** The objective of this study were to study the efficacy of dexmedetomidine as a sedative for endoscopic dacryocystorhinostomy performed under local anaesthesia compared to conventional sedative like midazolam and also to study the effects of dexmedetomidine on hemodynamic stability and analgesia.

**Methods:** In this randomized, prospective double-blinded study 40 adult patients were allocated into two groups. Group D received dexmedetomidine 1µg/kg loading dose over 10 minutes followed by 0.5 µg/kg/hr maintenance dose and Group M received 20 µg/kg midazolam at the start of procedure plus same dose repeated 30 minutes later. Endoscopic dacryocystorhinostomy was performed in all patients under local anesthesia. Sedation was assessed using the modified Observer's Assessment Alertness/Sedation (OAA/S) scale. Pulse rate (PR), Mean arterial pressure (MAP), oxygen saturation (SpO<sub>2</sub>), respiratory rate (RR) were recorded every 5 minutes for first fifteen minute and then every ten minutes till the end of the procedure. In the post anaesthesia care unit, Aldrete score was determined every 5 minutes till the patient was ready for discharge

**Results:** Patients receiving dexmedetomidine had a better OAA/S score throughout the procedure and were more cooperative. VAS scores were significantly lower in the dexmedetomidine group. Pulse rate, MAP were lower in Group D whereas SpO<sub>2</sub> values were higher in Group D compared to Group M. Group D had lesser amount of bleeding but the time taken to reach an Aldrete score of 10 was similar between the groups.

**Conclusion:** Dexmedetomidine is ideal for procedural sedation with the added benefit of hemodynamic stability, no respiratory depression and analgesia.

**Keywords:** Dexmedetomidine, Sedation, Midazolam, Endoscopic Dacryocystorhinostomy

## INTRODUCTION

Endoscopic Dacryocystorhinostomy (DCR) is now a well-established procedure to relieve nasolacrimal duct obstruction<sup>1,2</sup>. Traditionally endoscopic DCR has been performed under general anesthesia<sup>3</sup>. However it can also be performed under local anesthesia and the unwanted effects of general anesthesia can be avoided

when performed under local anesthesia with sedation. Most commonly midazolam, propofol and opioids are used as sedatives in monitored anesthesia care. Most of these drugs are associated with a considerable number of side effects including over-sedation, respiratory depression, hypoxemia, desaturation and prolonged time to discharge<sup>4,5</sup>. Dexmedetomidine the novel alpha 2 agonist has the unique quality of producing a natural sleep like sedation where the patient is easily arousable and there is no depression of respiration<sup>6,7</sup>. The advantage of dexmedetomidine in monitored anesthesia care for endoscopic DCR includes the ability of the patient to protect the airway. It has been evaluated in many studies as a sedative for monitored anesthesia care and has been found to be effective with the added benefit of analgesia<sup>8,9</sup>.

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This study aimed to evaluate the efficacy of dexmedetomidine as a sedative in patients undergoing endoscopic DCR under local anesthesia as compared to a conventional sedative like midazolam.

## MATERIALS AND METHOD

40 patients belonging to American Society of Anaesthesiology Grade I and II undergoing Endoscopic DCR were randomly divided into Group D or Group M using a computer generated randomisation schedule. Ethical committee approval was obtained and a written informed consent was obtained from each patient. Patients within 18- 60 years were included and patients with history of heart disease, liver and kidney dysfunction, allergy to drugs in the study, chronic use of other alpha 2 agonists, sedatives, narcotics were excluded. In order to ensure blinding the study drugs were loaded by the anesthesia technician. The drugs were loaded in a 50 ml syringe labelled as "infusion drug", a 5 ml syringe labelled as "bolus". Group D patients had dexmedetomidine 2µg/ml in the 50 ml syringe and normal saline in the 5ml syringe. Group M patients had normal saline in the 50 ml syringe and midazolam 20 µg/kg based on the patient's body weight mixed with saline to a volume of 5 ml in the 5 ml syringe. The observations were recorded by a blinded anaesthesiologist.

After the patients were shifted into the operation theatre standard monitoring were applied which included pulse oximeter, non- invasive blood pressure and ECG. Baseline measurement of Pulse rate (PR), Mean arterial pressure (MAP), oxygen saturation (SpO<sub>2</sub>), respiratory rate (RR) were obtained. Baseline sedation was assessed using the modified Observer's Assessment Alertness/ Sedation (OAA/S) scale: 5 = responds readily to name spoken, 4 = lethargic response to normal tone, 3 = responds only after name spoken loudly, 2 = responds after mild prodding/ shaking, 1 = asleep/ unarousable.<sup>10</sup> Pain was assessed on a 0 to 100 mm visual analog scale (VAS).<sup>11</sup>

Group D patients received dexmedetomidine 1µg/kg loading dose over 10 minutes followed by 0.5 µg/kg/hr maintenance dose from the 50 ml syringe and initial bolus of saline from the 5 ml syringe and another bolus of saline 30 minutes later. Group M patients received bolus of 20 µg/kg midazolam from the 5 ml syringe at the start of procedure plus same dose repeated 30 minutes later and saline infusion from the 50 ml syringe to maintain blinding. After receiving the loading dose, nasal cavity was packed with cotton pledgets soaked in 4% xylocaine mixed with 1:10,000 adrenaline. Before starting the surgery 2 ml of 2% xylocaine with 1:2,00,000 adrenaline was locally infiltrated.

The OAA/S, VAS, hemodynamic and respiratory variables were recorded every 5 minutes for first fifteen minute and then every ten minutes till the end of the procedure. For evaluation of the amount of bleeding during surgery, the quality scale proposed by Fromm and Boezaart<sup>12</sup> was used. The operative field conditions were assessed by the same operating surgeon for all the cases.

All adverse events including, but not limited to, bradycardia (HR <60 beats/ min), hypotension (MAP <60 mm Hg), respiratory depression (ventilatory frequency <10 bpm), oxygen desaturation (SpO<sub>2</sub> <92%) were recorded. In the post anaesthesia care unit, Aldrete score<sup>13</sup> was determined every 5 minutes till the patient was ready for discharge.

## STATISTICAL ANALYSIS

Means and standard deviations were computed for group D and M and comparison of means at the baseline for the two groups were made using independent samples student's t-test. Repeated Measures ANOVA followed by post hoc analysis Bonferroni was used to compare MAP, SpO<sub>2</sub>, RR. Chi-square test or Fisher's exact test for small sample was used for categorical data. Repeated Measures ANOVA for ordinal measures was used to compare sedation scores. A p-value of less than 0.05 was taken as statistically significant. The data were analyzed by using Microsoft Excel 2003 for construction of graph and SPSS version 16.0 software for data analysis.

## RESULTS

Baseline characteristics and duration of surgery were similar between the two groups (Table 1). Adverse events requiring intervention was not encountered in any of the patient.

There was a significant difference observed in the sedation scores [Table 2] between the two groups from 20 minute onwards. (p=<0.001). VAS scale shows statistically significant difference between two groups [Table 3].

The mean heart rate and MAP was not statistically different between the groups [Table 4, Table 5] (at baseline, 5 min & 10 min) but showed statistically significant difference from 15 min onwards.

There was statistically significant difference in the intraoperative peripheral oxygen saturation (SpO<sub>2</sub>) between the two groups from 10 min onwards [Table 6].

In grading of bleeding, there was significant difference between the two groups with lesser amount of bleeding in Group D [Table 7]. (p=<0.0001).



The time taken to achieve an Aldrete score of 10 was not statistically different between the groups. [Table 1]

**TABLE 1. Demographic features and Aldrete score**

	Group D	Group M	P value
Age(yr)	35.40±12.48	38.47±13.00	0.75
Weight (kg)	55.00 ±8.86	57.23 ± 9.74	0.45
Duration of surgery(min)	39.53±6.41	37.59±6.32	0.053
Time to reach Aldrete score of 10(min)	37.2±4.21	35.97±4.62	0.066

**TABLE 2. OAA/S in the two groups**

OAA/S	Group D Mean ± SD	Group M Mean ± SD	U-value	p-value
Basal	5 ± 0	5 ± 0	0	0
5 <sup>th</sup> min	5 ± 0	5 ± 0	0	0
10 <sup>th</sup> min	4.45 ± 0.51	4.7 ± 0.47	150	P=0.172
15 <sup>th</sup> min	4.2 ± 0.41	4.4 ± 0.5	160	P=0.274
20 <sup>th</sup> min	3.65 ± 0.49	4.2 ± 0.41	104	P=0.008
30 <sup>th</sup> min	3.45 ± 0.51	4.15 ± 0.36	76.50	P=0.0007
40 <sup>th</sup> min	3.45 ± 0.51	3.9 ± 0.64	126.50	P=0.045
50 <sup>th</sup> min	4.75 ± 0.44	4.2 ± 0.41	90	P=0.003

**Table 3. VAS in two groups**

VAS	Group D Mean ± SD	Group M Mean ± SD	t-value	p-value
5 <sup>th</sup> min	33.85 ± 0.745	36.45 ± 0.605	12.12	P<0.0001
10 <sup>th</sup> min	33.90 ± 0.641	36.40 ± 0.598	12.75	P<0.0001
15 <sup>th</sup> min	31.80 ± 0.768	36.35 ± 0.67	19.96	P<0.0001
20 <sup>th</sup> min	31.55 ± 0.51	36.25 ± 0.851	21.19	P<0.0001
30 <sup>th</sup> min	31.65 ± 0.489	36.25 ± 0.851	20.96	P<0.0001
40 <sup>th</sup> min	28 ± 1.12	38.50 ± 0.827	33.65	P<0.0001
50 <sup>th</sup> min	28.10 ± 1.33	40.60 ± 1.60	26.81	P<0.0001

**Table 4. Heart rate in two groups**

HR	Group D Mean ± SD	Group M Mean ± SD	t-value	p-value
Basal	75 ± 7.87	75.05 ± 7.86	0.02	P=0.98
5 <sup>th</sup> min	75.25 ± 7.72	75.80 ± 6.76	0.24	P=0.81
10 <sup>th</sup> min	72.50 ± 6.35	74.25 ± 7.05	0.82	P=0.41
15 <sup>th</sup> min	65.60 ± 3.82	74.05 ± 6.46	5.04	P<0.0001
20 <sup>th</sup> min	65.15 ± 3.42	73.70 ± 6.28	5.35	P<0.0001
30 <sup>th</sup> min	63.45 ± 2.37	72.70 ± 5.34	7.08	P<0.0001
40 <sup>th</sup> min	65.45 ± 3.85	72.65 ± 5.71	4.68	P<0.0001
50 <sup>th</sup> min	70.60 ± 3.89	75.95 ± 6.24	3.25	P=0.003

**Table 5. MAP in two groups**

MAP	Group D Mean ± SD	Group M Mean ± SD	t-value	p-value
Basal	92.45 ± 4.29	92.35 ± 4.23	0.07	P=0.94
5 <sup>th</sup> min	91.35 ± 4.13	91.45 ± 4.22	0.08	P=0.94
10 <sup>th</sup> min	91 ± 4.14	89.90 ± 4.08	0.85	P=0.40
15 <sup>th</sup> min	89.75 ± 4.14	89.25 ± 4.48	0.37	P=0.72
20 <sup>th</sup> min	81.75 ± 2.69	89.15 ± 4.17	6.67	P<0.0001
30 <sup>th</sup> min	80.65 ± 2.41	89.60 ± 4.12	8.38	P<0.0001
40 <sup>th</sup> min	81.20 ± 2.61	89.95 ± 3.69	8.66	P<0.0001
50 <sup>th</sup> min	84.90 ± 2.17	91.85 ± 3.54	7.48	P<0.0001

Table 6. SPO2 in two groups

SPO2	Group D Mean ± SD	Group M Mean ± SD	t-value	p-value
Basal	99.35 ± 0.745	99.65 ± 0.587	1.41	P=0.166
5 <sup>th</sup> min	99.40 ± 0.754	99.50 ± 0.761	0.42	P=0.679
10 <sup>th</sup> min	98.30 ± 1.03	96.30 ± 0.657	7.32	P<0.0001
15 <sup>th</sup> min	97.35 ± 0.93	95.15 ± 0.745	8.24	P<0.0001
20 <sup>th</sup> min	97.55 ± 1.10	95.05 ± 0.887	7.92	P<0.0001
30 <sup>th</sup> min	97.30 ± 0.979	95.0 ± 1.03	7.25	P<0.0001
40 <sup>th</sup> min	96.80 ± 0.768	96.25 ± 0.716	2.34	P=0.025
50 <sup>th</sup> min	99 ± 0.795	96.35 ± 0.671	11.40	P<0.0001

Table 7. Grading of bleeding

Grading of bleeding	Group D Mean ± SD	Group M Mean ± SD	U-value	p-value
	1.90 ± 0.447	3.1 ± 0.55	25	P<0.0001

## DISCUSSION

This study was undertaken to examine the efficacy of dexmedetomidine for sedation in endoscopic DCR. We hypothesised that dexmedetomidine would provide adequate sedation compared to conventional sedative like midazolam and better hemodynamic profile with better analgesic profile as well.

The sedative effect of dexmedetomidine is by virtue of its action on the  $\alpha_2$  receptors of the locus caeruleus. They also act through the endogenous sleep promoting pathways and hence patients appear to be in a state of natural sleep like sedation. In our study we found that the degree of sedation in both the groups were the same during the first 20 minutes but after 20 minutes patients receiving dexmedetomidine were more sedated compared to midazolam group. This could be due to the shorter half-life of midazolam.

In a study conducted by Alhashemi<sup>14</sup> and colleagues, iv dexmedetomidine provided equally effective sedation compared to midazolam for cataract surgeries under local anesthesia. In our study adequate sedation was seen throughout the procedure in the dexmedetomidine group and none of the patients had OAA/S score less than 3 in either of the groups. Ustun<sup>15</sup> and colleagues similarly found that dexmedetomidine provided adequate sedation compared to midazolam in outpatient third molar surgery and more number of patients had better "cooperation scores" in the dexmedetomidine group.

Another study conducted by Bergese<sup>16</sup> and colleagues that evaluated the efficacy of dexmedetomidine for sedation during awake fiberoptic intubation concluded that significantly less amount of rescue midazolam was needed to maintain a Ramsay sedation scale of >2.

Higher OAA/S scores is very essential in endoscopic procedures performed on the nose under local

anesthesia, without a throat pack, in order to maintain upper airway reflexes, so that blood trickling down from the nasopharynx is not aspirated. Patients sedated with opioids/ midazolam/ propofol have a considerable risk of aspiration. However on the other hand adequate patient sedation is also very important because patient movement due to apprehension during an endoscopic procedure can have serious complications like orbital injury, penetration into the brain, hemorrhage etc. The conscious sedation provided by dexmedetomidine appears to be ideal for such procedures.

We observed a significantly lower VAS scores in the dexmedetomidine group even though the procedure was performed under local anesthesia in both the groups. Most of the patients complain of pain/ discomfort when the bone over the lacrimal sac area is being removed. We observed that patients complaining of discomfort belonged to the midazolam group (11 patients-55%). Arain<sup>17</sup> and colleagues have demonstrated the opioid sparing effect of dexmedetomidine and its analgesic efficacy.

There was a significant reduction in blood pressure and heart rate in the dexmedetomidine group. Similar results were shown by Goksu<sup>18</sup> and colleagues in patients undergoing functional endoscopic sinus surgery. The central  $\alpha_2$  receptors are activated resulting in reduced sympathetic outflow. However hypotension and bradycardia requiring intervention was not observed in any of the patients.

Dexmedetomidine group patients had higher SpO<sub>2</sub> values compared to the midazolam group. Many studies have demonstrated the minimal effect of dexmedetomidine on respiration<sup>19</sup>. Since we did not monitor End tidal carbon dioxide (EtCO<sub>2</sub>) levels the effect on ventilation could not be assessed. RR were apparently same between the two groups.

Dexmedetomidine group had lesser amounts of bleeding as graded by the surgeon. This could be due to

the lower MAP in this group. Similarly Guven<sup>20</sup> and colleagues found lesser amount of bleeding and hemodynamic stability during functional endoscopic surgeries.

The time taken to reach an Aldrete score of 10 was similar between the groups. This is despite the dexmedetomidine group having better OAA/S scores towards the end of the procedure. The reductions in mean arterial pressure in the dexmedetomidine group resulted in lower Aldrete scores initially.

### CONCLUSION

The results in our study indicate that Dexmedetomidine is ideal for procedural sedation in endoscopic DCR as it provides a state of natural sleep like sedation with minimal effect on respiration and also protects the airway. It also provides anxiolysis, sympatholysis and added benefit of analgesia. It can be used safely in patients undergoing endoscopic procedures.

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# The Impact of Stressful Conditions and Prevalence of Depression and Suicides in Adolescents

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## ABSTRACT

Adolescence is a rather turbulent period since adolescents are suddenly expected to become autonomous, abstract thinking, problem solving, and planning individuals. They lack skills and experience in adjusting to these changes. When emotionality is high it leads to stress. If the stress can be controlled or overcome by using a successful coping strategy then the adolescent can get on with life normally. On the other hand if the level of stress is high and is for a prolonged period of time it usually results in depression. Due to lack of proper coping skills and remedial help increasingly more and more adolescents are committing suicides in our country. It is essential that stress and depression in adolescents is identified at the initial stages. Awareness of factors that contribute to the negative states and feelings of the adolescents can help in developing and implementing preventive measures. This article reviews research in these significant areas.

**Keywords:** *Adolescence, Mental Health, Adolescent Problems, Suicides*

## INTRODUCTION

Adolescence is characterized by multiple challenges, disruptions, and developments in biological, psychological, and social domains.<sup>[1]</sup> It is a rather turbulent period since adolescents are suddenly expected to become autonomous, abstract thinking, problem solving, and planning individuals from a dependent state during childhood. They lack skills and experience in adjusting to these changes<sup>[2]</sup> as a result of which many new problems emerge in an adolescent's life. Adolescence is a developmental period that has attracted greater attention compared to other developmental periods. Researchers focused attention on this stage of rapid growth, change, relocation and self-discovery, which are the defining qualities of stressful experience<sup>[3]</sup> itself. In this article a review of research on adolescence is presented on some of the vital and sensitive topics that warrant preventive measures covering several studies on Indian adolescents.

## EMOTIONALITY

Due to the heightened activity within the body and brain most adolescents find it difficult to cope with the sudden changes. If they are confronted with difficult parents, personal incompetencies and conflicting situations they easily fare up and have unpredictable moods. In their study on *Angry thoughts predict stress & health among college students in Mumbai, India* administered the Anger Cognitions Inventory, a

self-report measure assessing cognitions associated with resentful and reflective anger.<sup>[4]</sup> They found that cognitions defining resentful anger were positively associated with poor physical health, hostility, and stress, whereas self-statements indicative of reflective anger were not related to any of these variables. They stated that cognitive self-statements may exacerbate the experience of anger and subjective distress.

The emotional problems of adolescents seeking professional help for health problems are traced.<sup>[5]</sup> The results revealed that adolescents were less likely to seek professional help for their emotional problems. Emotional conflicts and stressful life events were suspected to be playing role in illness though the extent to which these stresses were involved varies. In this study in order to understand the psychosocial concerns and problems among adolescents, a detailed psychosocial history followed by a thorough physical examination was undertaken. The immediate cause of emotional reaction in the psychosocial environment of the adolescents was observed to be originating from behavioural, psychological and physiological disturbances.

In a study on 105 students of class XI & XII of Dharwad of Karnataka, the findings revealed that the adolescents with high emotional maturity had significantly high stress and self-confidence when compared to those with low emotional maturity.<sup>[6]</sup> In a preliminary study of impulsivity in rural and urban adolescents no significant difference between

impulsivity scores of adolescents of urban and rural areas were found. The researchers also did not find any gender related differences.<sup>[7]</sup> Adolescents sometimes in states of high emotionality and lack of proper direction, resort to taking extreme measures like committing suicides. In a study<sup>[8]</sup> on suicide attempters it was found that feelings of sadness, depression, disappointment, and emptiness were the emotions most often experienced by participants in the period immediately following their suicide attempts. By contrast, respondents later felt glad or grateful they had survived. Treatment with a health care professional was mentioned most often as preventing current suicidal behavior and also identified as the most frequent coping strategy. It was also found that most adolescents were able to develop effective coping strategies and find meaning in life following suicide attempts because of professional help.

### STRESS

It is observed that the age of adolescence is accompanied by stress related to school, family and peers, which adolescents often find it difficult to manage.<sup>[9]</sup> Self-confidence and self-faith may serve to overcome such stages of crisis. In a study on both female and male adolescents it is found that the main sources of stress in both genders is getting up early in the morning, pressure to study, having to concentrate for too long during college hours, not having enough money to buy things, and long college hours.<sup>[10]</sup> Stress is a very familiar condition faced by the students when they are unable to bear the risks involved in higher education. The main sources of stress are academic and time concerns, fear of failure, classroom interactions, and economic issues.<sup>[11]</sup> Apart from this, the parental system also affects a lot. The parents have unlimited expectation from their children and therefore they impose their own desires on them.

It is usually observed that medical students undergo tremendous stress during various stages of the MBBS course. A study to determine incidence of stress and factors controlling stress in medical students at various stages of MBBS course found that of the 238 students who participated, majority of the medical students 73% perceived stress. Stress was found to be significantly more in second and third MBBS students rather than first MBBS levels. Academic factors were greater perceived cause of stress in medical students. Stress was more common in medical students who have dominant strategy of coping as positive reappraisal, accepting responsibility and planful problem solving.<sup>[12]</sup>

### DEPRESSION

When emotionality is high it leads to stress. If the stress can be controlled or overcome by using a successful coping strategy then the adolescent can get on with life normally. On the other hand if the level of stress is high [due to high emotionality or other factors] and is for a prolonged period of time with which the adolescent is unable to cope, then it results in depression. The occurrence of adolescent depression is on increase in alarming rate. The first onset of depression is being manifested at a younger age than observed previously. Pediatric care settings in India have reported 11.2 per cent cases of prevalence of depression among adolescents.<sup>[16]</sup> Depression and stress were found to be significantly associated with the number of adverse events in the adolescent's life that occurred in last one year.<sup>[17]</sup>

The study *Levels of impulse control and self-efficacy in depression at risk and vulnerable adolescents* identified adolescents 'at risk' of developing depression. The results of this study revealed that depression 'at risk' adolescents are the weakest in controlling impulses, be it negative affective indexes such as fear, anxiety, grief, anger, reaction to ego threat and endurance or positive and undifferentiated emotions index. High perceived self-efficacy and strong ability of impulse control are considered to be positive personality characteristics helpful in reducing depressive symptoms. It has been found that positive resources of self-management strategies and school based mental health interventions focusing on problem solving/worry will help reduce depressive tendencies.<sup>[18]</sup>

### SUICIDE

Due to lack of proper coping skills and remedial help increasingly more and more adolescents are committing suicides in our country. It is essential that depression in adolescents is identified at the initial stages. Several investigators who studied suicide in different parts of India have reported suicide rates varying from 6.8 to 58.3/100,000.<sup>[19-24]</sup> The suicide trend is increasing at alarming pace. In 1990, the Indian suicide rate was 8.9 per 100 000 per year.<sup>[25]</sup> The suicide rates peaked for those aged 18-29 for both men and women, and that suicide rates for women aged 10-17 were higher than those for men.<sup>[26]</sup> As per the latest review article<sup>[27]</sup> the suicide rate in India is 10.3. In the last three decades, the suicide rate has increased by 43% but the male female ratio has been stable at 1.4:1.

An epidemiology of suicide in India from 1975-1994, with data on suicide rates by gender, the

methods used for suicide, and the officially-recorded motives for suicide was conducted.<sup>[28]</sup> In 1991, the Indian suicide rate was 9.2 per 100,000 per year. In this study it was found that the most common methods for suicide are poisoning and hanging. Researchers found significant predictors of suicide among all adolescents. These predictors were hopelessness, family support, physical abuse, sexual abuse, alcohol use, hard drug use, and school climate.<sup>[29]</sup> It is also found that problem-solving skills in suicidal college students were more limited when compared with non-suicidal students.<sup>[30]</sup>

Studies from South India have reported higher rates of suicide than those from the north of the country. In the study *Suicides in young people in rural Southern India*<sup>[31]</sup> used the verbal autopsy method to assign cause of death. The mortality rates were analysed for 10 years, from 1992 to 2001, for the age-group 10–19 years. They found that suicides accounted for about a quarter of all deaths in young men and between 50% and 75% of all deaths in young women. In a study restricted to middle and late adolescents it is found that about 15.8% of adolescents in their study of 550 students [14 to 19 yrs] reported having thoughts of attempting suicide, while 5.1% had actually attempted suicide, both being more in females than in males.<sup>[32]</sup> Considerable evidence indicated that childhood and family adversities in general such as childhood sexual and physical abuse, witnessing domestic violence, parental separation or divorce and living with substance abusing, mentally ill or criminal family members results in suicidal behavior.<sup>[33]</sup> In a cross-sectional study of 3662 youth [16–24 years] from rural and urban communities in Goa, suicidal behaviour during the recent 3 months and associated factors were assessed using a structured interview. Overall out of the 144; 3.9% youth reported any suicidal behaviour in the previous 3 months. They identified socio-demographic and educational factors such as female gender, older age group, those who are not attending regular school or college and those who were absent from school for more than 4 days in the past 3 months to be significant.<sup>[34]</sup>

### CONCLUSION

Adolescence is a unique period in the course of life, as it represents a critical developmental phase in terms of implementing healthy behaviour leading to psychosocial adjustment and well-being.<sup>[35,36]</sup> It is also the stage during which their education is at the peak and career is set. If valuable time is lost in stress, depression and worse still, suicidal thoughts and attempts, then it is going have an adverse impact on the future life. Committing suicidal by adolescent indicates not only a major loss to the family but a shame to the society and nation at large. Awareness of factors that

contribute to the negative states and feelings of the adolescents can help in developing and implementing preventive measures at all levels in the 'future' of Mother India!

Mood regulation problems leading to depression and suicides typically start in adolescence. This is highly relevant from a public health perspective, as depression is ranked as the fourth leading cause of disease burden, accounting for almost 12 percent of disabilities worldwide,<sup>[37]</sup> and is linked with dysfunctional psychosocial adaptation over the lifespan.<sup>[38]</sup> Adolescence is thus a period when prevention of mental health problems could have a particularly potent influence by altering developmental trajectories.<sup>[39]</sup> Ideally, prevention should take place before the first symptoms arise so the concept of *universal preventive intervention* has been proposed.<sup>[40]</sup> It is intervening early on in the developmental continuum of a disorder and aimed at enhancing resilience in the population. By learning successful coping strategies during adolescence, the effects of prevention efforts can be generalized to other demanding, stressful situations which reduce the risk of development of a number of physical, psychological and psychiatric disorders.

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# Adenoid Cystic Carcinoma of Parotid Gland: A FNAC Diagnosis

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## ABSTRACT

Adenoid cystic carcinoma (ACC) is an uncommon salivary gland malignancy and accounts for 4% of all neoplasms of salivary glands. It most commonly occurs in minor salivary glands and palate, parotid being the least common site. It usually presents in 4th-6th decade with slight female predominance. ACC is an aggressive and recurrent tumor and has a poor prognosis with a 5 year survival rate of 60-75%. However, prognosis is slightly favorable in parotid because of its accessibility. FNAC aids not only in the diagnosis but also in typing of ACC and hence in planning the surgical treatment. FNAC as a rapid and reliable diagnostic tool, aids in early diagnosis can help favor the prognosis.

Here we present a case of ACC in a 40 year old man, because of its rarity in parotid gland and early diagnosis on FNAC.

**Keywords:** Adenoid Cystic Carcinoma, Parotid Gland, FNAC.

## INTRODUCTION

Adenoid cystic carcinoma (ACC) is an uncommon salivary gland malignancy that presents insidiously, has an indolent course and an unfavorable long term prognosis<sup>1</sup>. It is currently recognized that, ACC is extremely difficult to treat. It was described by Conley & Digman as

One of the most biologically destructive and unpredictable tumors of the head and neck”<sup>2</sup> ACC was described by three Frenchmen (Robin, Lorain, Labourane), in 1953 as a cylindrical tumor. It was Billroth in 1859, who first described ACC under the name “Cylindroma”. He also described that ACC had a great tendency to recur<sup>2</sup>.

Most ACCs arise in the minor salivary glands (60%) and most frequently in oral cavity. The use of Fine Needle Aspiration Cytology (FNAC) is widely accepted

in the diagnostic procedure of Head & Neck and salivary lesions. The cytodiagnosis of ACC is feasible in most cases by finding of large globules of extracellular matrix<sup>2</sup>.

## CASE SUMMARY

A 40 year old male presented with recurrent painful mass, of 6 months duration duration below the left ear. There was past history of surgery for a similar lesion in the same location two years back. Clinical examination revealed a mass in the left parotid region, measuring 3X4 cms. It was hard and tender.

FNAC was done. Smears stained with Papanicolaou (PAP), Heamatoxylin & Eosin (H&E) and May Grunwald-Giemsa (MGG) Stains revealed a cell rich aspirate, comprising of good number of oval cells with uniform round to oval hyperchromatic nuclei, coarse chromatin, nucleoli and scant cytoplasm. The cells were seen in tight three dimensional clusters with cribriform pattern (Fig 1). Numerous hyaline spherical globules of varying sizes were seen which were adherent to tumor cells (Fig 2). FNAC diagnosis of ACC was made. These findings were confirmed later by histopathology, which showed a cribriform pattern, of growth with dense fibro-hyaline stroma (Fig 3). Perineurial invasion was also seen.

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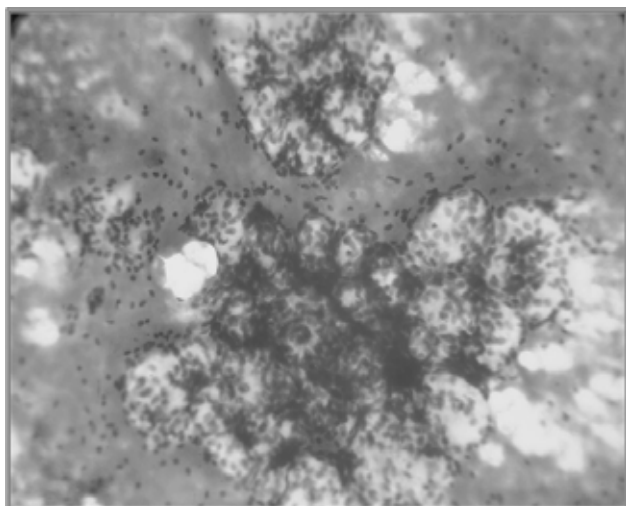


Fig. 1. Microphotograph showing cribriform pattern of tumor cells with hyperchromatic nuclei (PAP, X 200)

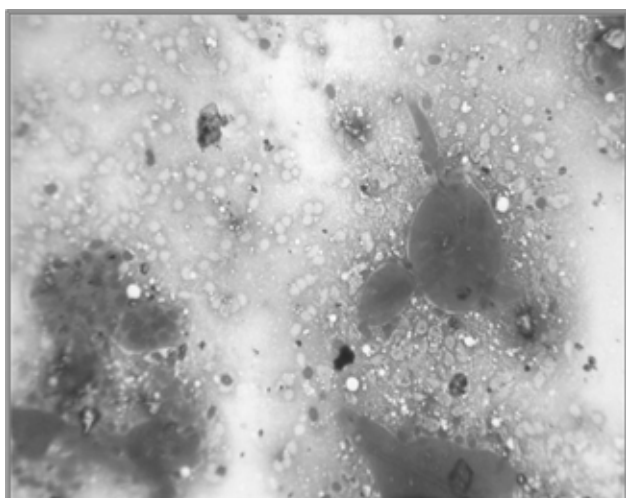


Fig 2. Microphotograph showing hyaline globules of varying sizes with few clusters of tumor cells. (MGG, X 200)

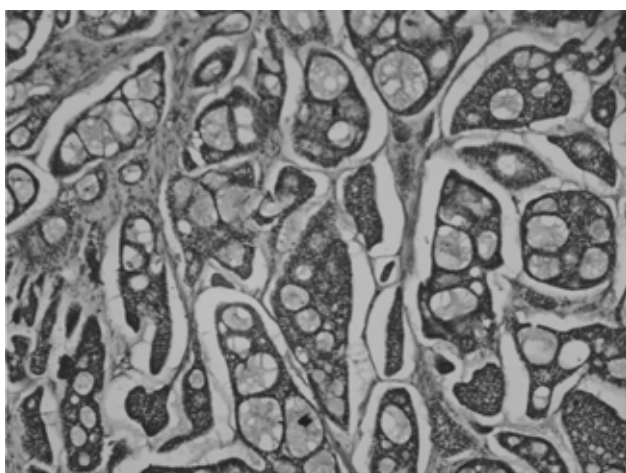


Fig. 3. Microphotograph showing cribriform pattern of ACC on histopathology. (H&E, X 200)

## DISCUSSION

ACC accounts for 4% of all neoplasms of salivary glands<sup>2</sup>. It most commonly occurs in minor salivary glands and palate, parotid being the least common site. It frequently presents in 4<sup>th</sup>-6<sup>th</sup> decade with slight female predominance. It is usually accompanied by pain in the mass due to perineurial invasion.<sup>3</sup> Distant metastasis to lung, bone and soft tissues are common than regional lymph node metastasis. ACC is an aggressive and recurrent tumor and has a poor prognosis with a 5 year survival rate of 60-75%. Unique feature of ACC is its propensity for perineurial invasion, even in the early stage which is the cause for pain and tenderness<sup>2</sup>.

ACC is Complex neoplasm that contains both luminal (ductal) & abluminal (myoepithelial) cells. Histologically it may present as cribriform, solid or tubular pattern. FNAC shows cell rich aspirate with monomorphic cells and hyperchromatic nuclei in cohesive clusters. In Cribriform pattern, globules of mucoid material (Hyaline Globules) are seen surrounded by tumor cells. It also shows finger like or beaded hyaline stroma between the cells clusters.<sup>4</sup> Immunohistochemically ductal cells are positive with EMA, CEA and CK. Myoepithelial cells stain with Vimentin and Actin and show variable staining for CKs. Stromal hyaline material shows positivity with Type IV collagen and Laminin.<sup>5</sup>

### Cytological Differential Diagnosis

#### 1. Cellular pleomorphic adenoma.

Differentiated from ACC, by fragments of myxoid matrix with spindle cells which are specific to pleomorphic adenoma, globules are fewer less dense and less intensely staining and a close attention to nuclear morphology is important<sup>4</sup>.

#### 2. Basal cell adenoma (BCA)

In BCA of trabecular variant, cells are of basaloid epithelium, lack the abundant cytoplasm & distinct cell borders of myoepithelial cells. Stromal material is scanty. Hyaline globules are smaller, of more uniform size & with a less hyaline texture.<sup>4</sup>

#### 3. Polymorphous low grade adenocarcinoma

It occurs in minor salivary glands, in palate and extremely rare in parotid. Cells adhere to strands of fibrovascular stroma in a trabecular pattern. Hyaline globules though present, are scanty.<sup>4</sup>

#### 4. Other Carcinomas

Other carcinomas that contain globules of basement membrane like material are basal cell carcinoma, epithelial-myoepithelial carcinoma. The cellular morphology in these carcinomas is distinctive. Distinction from ACC is less important as the surgical treatment remains the same.<sup>4,5</sup>

However cytological identification of ACC rests on adequate sampling and careful inspection of all the material<sup>5</sup>.

FNAC aids not only in the diagnosis but also in typing of ACC (Cribriform / tubular/ solid) and hence in planning the surgical treatment. According to most studies, cribriform variant has a worst prognosis<sup>2</sup>. In our case, cribriform pattern could be identified.

Although ACC is difficult to treat, it is treated by local radical excision with post-operative radiotherapy. The outcome is favorable in parotid as compared to minor salivary glands, which could be attributed to the earlier diagnosis at this accessible sites<sup>2,5</sup>.

#### CONCLUSION

ACC is rare malignant tumor in parotid. Although highly aggressive and recurrent, prognosis is slightly favorable in parotid because of its accessibility. Since it is a difficult tumor to treat, early diagnosis can help favor the prognosis. FNAC as a rapid and reliable tool, aids in early diagnosis and identifying the growth

pattern which in turn aids in planning the management of ACC.

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**Conflicts of Interest:** Nil

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# Evaluation of Drug Therapy in Cataract Surgery at Saraswathi Institute of Medical Sciences, Ghaziabad, U.P., India

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## ABSTRACT

**Objective:** To study the prescribing pattern in cataract surgery patients in SIMS, for evaluation of their pharmacoepidemiology.

**Material and methods:** A retrospective study was conducted in the department of Pharmacology in collaboration with the department of Ophthalmology for a period of one year. Total 720 patients were analysed. Utilisation pattern of drugs like dosages form, route, frequency of administration and duration of therapy in preoperative, intraoperative and postoperative were audited. Drug prescription versus therapeutic indication was also evaluated.

**Result:** Different antibiotics mostly Fluoroquinolones, (like moxifloxacin (71.11%), gatifloxacin (16.66%), ofloxacin (4.16%) and anti-inflammatory drugs - bromofenac (54.27%), flurbiprofen (45.27%) and mydriatic-cycloplegic agents were prescribed.

**Conclusion:** The prescription was logical in respect of therapeutic indication. But in view of cost Moxifloxacin and Bromofenac could have been replaced by cheaper antibiotics and anti-inflammatory drugs as Ofloxacin and Flurbiprofen.

## INTRODUCTION

Drug utilization is basically manufacturing, marketing, distribution, prescription and use of drug in society, again with emphasis of social and economic consequence. Study of drug utilization is important in healthcare system. It is necessary to evaluate the pattern of drug utilisation from time to time to increase the therapeutic efficacy and to decrease the adverse effects, inappropriate use of drugs and unnecessary expensive. Drug utilization pattern identifies the problems that arise from the drug usage in health care delivery system and highlights the current approaches to the rational use of drugs.

Pharmacoepidemiology is the study of use and effects of drugs on large group of people. It is a bridge between both Pharmacology and epidemiology. Pharmacoepidemiology is the use of drug, its effects and side effects in population with purpose of supporting rational of cost effectiveness in economics, social & medical aspect of society and can also be defined as the transparent application of epidemiological methods through pharmacological

treatment of conditions to better understand the conditions to be treated.

Considering all these facts a study was planned to explore the utilization pattern of drugs in cataract surgery. In cataract surgery, different fluoroquinolones (like moxifloxacin, gatifloxacin, ciprofloxacin and ofloxacin), anti-inflammatory drugs and mydriatic-cycloplegic drugs are prescribed<sup>1,2</sup>. Most commonly used fluoroquinolone should be cheap and easily available like ofloxacin<sup>3,4</sup>.

A newer drug Levofloxacin (4<sup>th</sup> generation FQ) also holds the benefit of preservative drug and has favourable ocular disposition provides support for trials of systemic levofloxacin for prophylaxis of postoperative ophthalmitis<sup>5,6,7</sup>. FQs should be considered among the most interesting agents for antimicrobial prophylaxis in cataract surgery, since they have a comprehensive spectrum of activity covering most of the ocular pathogens and possess an excellent pharmacokinetic profile enabling penetration through several anatomical barriers<sup>8,9,10</sup>. So the present study was planned retrospectively aiming

pharmacoepidemiological analysis of drugs prescribed for the patients undergoing cataract surgery. In our study we conducted a detailed study on drugs utilized in the hospital preoperatively, intra operatively and post operatively in cataract surgery patients.

### MATERIAL & METHOD

Study was done in the department of Pharmacology in collaboration with department of Ophthalmology of SIMS, hospital. Permission to handle the records from ophthalmology dept. of SIMS was granted and approved by institutional ethical committee. Material were obtained from admission files and discharge tickets of cataract patients admitted for cataract surgery in the department of ophthalmology. Patients were screened for a period of one year. (from February 2010 to Jan 2011)

Census method of sampling of data was followed. Patients demographic profile, details of surgery, prescription of drugs, route of administration and duration of therapy were recorded for the period of one year. Collected data were compiled, analysed and evaluated. Evaluation was done mainly on two factors rationality of drug prescription and cost effectiveness

### OBSERVATION

Searching one year record in eye department, 720 patients were screened out. All elderly cataract surgery patients (age above 40-90) included. Patients below 40 were (no. 17) of secondary cataract (mainly uveitis and traumatic cataract).

Pediatric cataract was excluded from our study. ECCE with PCIOL/ Phaco with non foldable lens was performed in most of the pts. Combined surgery was also done in 57 patients.

**Table 1. Drugs Prescribed Pre-operatively for cataract Surgery**

Drugs	No. Patients	Percentage	Combined with another drugs	Route and dosage form	Frequency and duration
Moxifloxacin	51220	71.11% 2.78%	Prednisolone	Topical (Eye drop) 3days before surgery	One drop four times a day for 3days
Gatifloxacin	12010	16.66% 1.39%	Prednisolone		One drop four times a day for 3days
Ofloxacin	30	4.16%			One drop four times a day for 3 days
Ciprofloxacin	28	3.89%			One drop six times a day for 3 days
Gatifloxacin	402	55.83%		Oral ( Tablet )	Once a day for 3days
Ciprofloxacin	190	26.58%		One day before surgery	Twice a day for 3days
Ofloxacin	128	17.77%			Twice a day for 3days
Bromofenac Flurbiprofen	394 326	54.27% 45.27%		Topical Eye drop 3days before surgery	One drop for times a day
Tropicamide	623	86.52%	Phenylephrine	Eye Drop	One drop at 15 minute interval on day of surgery
Tropicamide Mannitol	97 57	13.48% 7.91%		Intravenous oral	1/2hour before surgery
Acetazolamide	57	7.91%		Tablet 250mg twice a day	1night before a surgery
Diazepam	18	2.5%		Tablet 5mg	
Alprazolam	10	1.38%		Tablet 0.5mg	

**Table 2. Drugs Prescribed intraoperatively for cataract surgery (No. of Patient 720)**

Drugs	No. of Patients	Percentage	Route & Dosage forms	Frequency & Duration
Local Anaesthetic	705	97.92%	Peribulbar inj	once
General Anaesthetic	15	2.08%	Inhalation	
Gentamycin	720	100%	Subconjunctival inj. 0.5ml	Once at the end of operation
Moxifloxacin	720	100%	Intracameral inj.0.5ml	Once at the end of operation
Dexamethasone	720	100%	Subconjunctival inj. 0.5ml	once

**Table 3. Drugs Prescribed postoperatively for cataract surgery (No. of Patient= 720)**

Drugs	No. Patients	Percentage	Combined with another drugs	Route and dosage form	Frequency and duration
Moxifloxacin	483	67.09%	Prednisolone	Eye drop	1drop one hourly for 7days
Ciprofloxacin	118	16.39%	Dexamethasone		1drop 6times a day for 7 days
Gatifloxacin	80	11.11%	Prednisone		1drop 6times a day for 7 days
Ofloxacin	39	5.41%	Dexamethasone		1drop 6times a day for 7 days
Gatifloxacin	402	55.83%		Tablet	Twice daily for four days
Ciprofloxacin	190	26.58			Twice daily for four days
Ofloxacin	128	17.77%			Twice daily for four days
Ibuprofen	720	100%		Tablet	Twice daily for 3days or SOS
Antacid	700	98.61%			1teasful twice daily for 5days
Ranitidine	651	90.41			Twice daily for 5days or SOS
Cyclopentolate	15	2.08%	Phenylephrine	Eye drop	Twice a day for one week
Tropicamide	82	11.66%			Twice a day for one week
Tropicamide	623	86.52%			Twice a day for one week
Acetazolamide	57	7.91%		Tablet	1Tab thrice a day for 3days
Timolol	57	7.91%		Eye Drop	1drop twice a day
Prednisolone	17	2.36%		Tablet50mg Eye Drop	Once a day for 5days1drop 6times a day for 7days

Irrespective of age and type of IOL, all pts were administered a set pattern of drugs preoperatively, intraoperatively and post operatively ( except for 8patients who had mild iritis post operatively).

Most frequently prescribed topical antibiotics preoperatively was Moxifloxacin( 71.11%) followed by Gatifloxacin(16.66%) Ofloxacin(4.16%), and Ciprofloxacin(3.89%) respectively. Antibiotic with

steroid combined ( Moxifloxacin+Dexamethasone and Gatifloxacin+Prednisolone) was prescribed in all patients ( 17 cases of secondary cataract).Oral antibiotic mainly Gatifloxacin(55.83%) followed by ciprofloxacin (26.58%) were given preoperatively all patients one day prior to surgery, totally given for three days.

Topical anti inflammatory drops mainly Flurlbiprofen (45.27%) and Bromofenac(54.73%) were

used in all patients three days prior to surgery. In 57 patients of combined surgery oral acetazolamide tablet 250mg was given one week prior to surgery and mannitol intravenously was given ½ hr before surgery. Preoperatively Diazepam or alprazolam was added in few patients to reduce the anxiety. Topical mydriatic mainly Tropicamide + Phenylephrine (86.52%) only tropica (in Hypertensives) (13.48%) was given preoperatively in all patients to dilate the pupil. Intraoperatively local anesthetic drug was used in the form of peribullar injection. Uncooperative, apprehensive patients and patients with traumatic cataract were operated under general anaesthesia. Sub conjunctival gentamycin (0.5ml) with dexamethasone (0.5ml) was given at the end of operation to all patients (100%)

In post operative phase topical antibiotic with dexamethasone combination and antibiotic with prednisolone were used mainly. Oral antibiotic which was started one day prior to surgery were continued four days post operatively. Antacids were added to reduce gastritis from oral drugs for five days. Analgesic (oral ibuprofen) was given to all secondary cataract patients for 2-3 days and sos in rest of the patients. Topical tropicamide with phenylephrine combination (86.52%), tropicamide alone (11.66%) and cyclopentolate (2.08%) for 7 days. Oral acetazolamide was given one day post operatively to all the patients followed by timolol (0.5%) topical drops.

## DISCUSSION

Pharmacoepidemiology is a powerful tool that can benefit patients and public health, but only if used appropriately. It is a research tool of global importance. Drug utilization research is a tool for prescription audit and an essential part of pharmacoepidemiology as it describes the extent, nature and determinants of drug exposure<sup>11</sup>. W.H.O. organizes drug utilization research with the goal towards rational prescription through some methods for auditing drug therapy<sup>12</sup>.

The study was done to rationalize the prescription from pharmacological point of view. Periodical auditing of prescription was necessary to reach the goal, so we audited cataract surgery retrospectively. Usual prescription pattern was one antibiotic, one anti-inflammatory and one mydriatic-cycloplegic agent<sup>13</sup>. Mostly topical ophthalmic preparation were prescribed<sup>14</sup>. Prescribed antibiotics were different fluoroquinolones, which were used to prevent development of postoperative endophthalmitis<sup>15</sup>. Although ciprofloxacin is cheapest fluoroquinolone it was not that frequently prescribed as compared to moxifloxacin<sup>16</sup>. Moxifloxacin is a new 4<sup>th</sup> gen fluoroquinolone prescribed frequently<sup>17</sup>. Being

expensive it should be used in rare situations<sup>18</sup>. Oral antibiotics were prescribed in both preoperative/postoperative period in some cases of endophthalmitis

Benefit of systemic antibiotic in preventing endophthalmitis is controversial. Optimum antibiotic concentration in aqueous humor can be achieved via topical route<sup>19</sup>. Frubiprofen was used as anti-inflammatory agent post-operatively and also in view of maintaining intraoperative mydriasis and in preventing cystoid macular oedema post operatively<sup>20</sup>. Although Bromofenac is recently more potent anti-inflammatory agent but should be used in few patients in view of its cost<sup>21</sup>.

Antibiotic preoperative steroid antibiotic combined is used as anti-inflammatory agent in cases of secondary cataract (due to iritis)<sup>22</sup>

Post operative steroid were used mainly for the anti-inflammatory action combined of steroid antibiotic were used for better compliance. Mydriatics were used preoperatively & preoperatively to help in surgical procedure, post operatively it is used to reduce postoperative uveitis or iritis. Acetazolamide, timolol and mannitol were prescribed preoperatively to reduce raised intra ocular pressure (IOP) and subsequent corneal oedema in associated glaucoma. Post operatively acetazolamide alone or with timolol were prescribed for anticipated rise of IOP due to some preoperative and intraoperative complication. Intra operative gentamycin and dexamethasone were injected as depot for prolonged antibiotic and anti-inflammatory coverage. Surgery was done after proper control of hypertensive and diabetes. Whatever drugs were prescribed in three phases of cataract surgery, were prescribed according to the type of cataract (secondary or senile) without any sex variation. Drugs were effective and safe. No adverse events was mentioned. No incidence of postoperatively endophthalmitis was found.

Prescription was logical in respect of therapeutic indication but in view of cost of drugs bromofenac and moxifloxacin could have been replaced by cheaper antibiotic and anti-inflammatory drug as ofloxacin, levofloxacin (as fourth generation fluoroquinolone with broader spectrum of activity) and flurbiprofen could have also been added<sup>23</sup>. Levofloxacin also holds the benefit of a preservative free drug, thereby reducing corneal damage caused by preservative being used in other topical antibiotic (benzylalkoniumchloride BAK)<sup>24</sup>. Antianxiety drugs (diazepam and alprazolam) could be given only one day prior surgery instead of given three days<sup>25</sup>. Postoperative analgesics can not be justified unless patient has some pain inducing problem as iritis or endophthalmitis.

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**Conflict of interest** - None

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# The Effect of Police Density to Improve Motorcycle Helmet Use in Thailand

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## ABSTRACT

While it is well established that motorcycle helmets reduce the risk of fatal injury and death, scaling up law enforcement on helmet use is still a big challenge for developing countries. These countries have a heavy burden from motorcycle-related injuries, but have limited resources for law enforcement. This report used cubic spline regression analysis on national datasets and a nationwide roadside survey of helmet use in Thailand. It has demonstrated that police density (number of policemen per square kilometer) is an independent predictor of helmet use ( $p < 0.001$ ) after controlling for adult literacy. This finding is consistent with evidence about effective deployment of limited numbers of police to ensure substantial and sustainable reductions of fatal road crashes in the rural road network in Queensland State of Australia. Concerning policy decisions about resource allocation, the finding provides a new parameter for allocation of limited numbers of police. Police density was also significantly associated with gross provincial product (GPP) per capita ( $p < 0.001$ ) and population density ( $p < 0.001$ ). These additional important findings raise concerns about equitable allocation of the police force in Thailand.

**Keywords:** Police Density, Helmet use, Law Enforcement, Thailand

## INTRODUCTION

Globally, road traffic injuries (RTIs) resulted in 1.3 million deaths in 2004 with a major share in developing countries<sup>1</sup>. Together with the magnitude of burden, rising trends of RTIs in many developing countries have concerned public health authorities and governments. In Thailand, it is estimated that RTIs killed 28,600 in 2004<sup>2</sup>. Motorcycle related injury constitutes the majority of RTIs in countries such as Thailand and Vietnam<sup>3,4</sup>. The cost of RTIs in Thailand was estimated at 232,855 million Baht or 2.81% of the Gross National Product in 2004<sup>5</sup>.

A meta-analysis reported that helmet use reduces the risk of head injury by 72% and are also likely to reduce the risk of death, although the effectiveness may be modified by speed<sup>6</sup>. A report of cost effectiveness modeling revealed that motorcycle helmet legislation would cost 495-784 USD/disability adjusted life year (DALY)<sup>7</sup>. Similarly, legislation for helmet use applies only on certain assigned routes and national roads in Vietnam which resulted in five times the prevalence on city roads<sup>8</sup>. Nevertheless, the helmet use rate has remained low in developing countries<sup>8,9,10</sup>. In addition to law enforcement, a study in a typical Malaysian town by Kulanthayan et al., (2000)<sup>9</sup> revealed compliance of helmet use was related to age, gender, race, formal

education level, prior accident experiences and type of license held. More recently, Hongsraragon et al., (2011)<sup>11</sup> have shown a link between helmet use and perceived risk of road crashes in Thailand.

With substantial growth of motorcycle ownership and use in large cities and provincial areas of many developing countries<sup>12,13,14</sup>, it is a challenge to scale up law enforcement on helmet use nationwide. To meet this challenge, there is a need for political commitment, evidence-based planning, resource mobilisation plus allocation and effective implementation.

In countries with national legislation, helmet use rates and patterns may vary considerably from one region to the next depending on educational level, penalty charged and enforcement activities<sup>15</sup>. It has been recognized that a major obstacle to attain and sustain a high level of law enforcement in low-income and middle-income countries is limited police resources<sup>15</sup>. This issue has not been clearly addressed despite the availability of the WHO manual for policy decision-makers and practitioners on helmet use<sup>16</sup>.

Recently, a study in Thailand revealed the cost of general risk-behavior monitoring per suspect was 0.69 baht, while the unit cost of detecting the use of safety



devices, such as seat belts, was about 6–8 baht (0.2 USD) extra per offender<sup>16</sup>. Per check-point, the cost of this safety device use detection was 1,547 baht (52 USD). Making use of the unit cost knowledge requires answering 2 key questions. 1) What is the total number of police officers required to provide an acceptable level of service? 2) How should a specified total number of these officers be allocated by geographical regions or time periods to maximise helmet use<sup>15</sup>.

Concomitantly, a national policy decision was made in Thailand to implement an extensive motorcycle helmet use campaign across the country starting in 2010. This could potentially have been another ad hoc campaign without sustained effect similar to previous ones since the helmet law came into effect on a national scale in 1994. Out of this concern, a large scale national survey of helmet use in all 76 provinces was undertaken to monitor the policy implementation<sup>17</sup>. This survey revealed a two fold discrepancy in the percentage of helmet use across geographical regions. A larger discrepancy of 4.3 folds was observed between provinces in Thailand.

Making use of the survey findings and other relevant datasets, this report aimed to shed some light on the association between law enforcement related factors and rate of helmet usage in order to better guide the allocation of police manpower with respect to this policy decision.

## MATERIALS AND METHOD

### A. Datasets

According to a study using multiple correspondence analysis, the several potential predictors (adult literacy, population density and gross domestic product) were associated with road safety performance of 23 selected E.U. countries<sup>18</sup>. To our best knowledge, the potential predictors which have been identified in this report are the best available evidence in this subject area.

For the purpose for this report, the following datasets were obtained: a) projected population, estimated gross provincial product (GPP) and province-specific adult literacy in 2010 were retrieved from the websites of the National Economic and Social Development Board ([www.nesdb.go.th](http://www.nesdb.go.th)); b) number of police in 2010 for each province from the website of the Royal Thai Police (<http://www.personnel.police.go.th/index.php>); c) province specific area in square kilometers from the website of the Department of Provincial Administration (<http://www.dopa.go.th/padmic/jungwad76/jungwad76.htm>); and d) helmet use from the nationwide roadside survey<sup>17</sup>.

The source of data on motorcycle helmet use was the database from the nationwide roadside survey<sup>20</sup>. Detailed sampling design and data analysis were presented in the report. In brief, the nationwide survey, undertaken from May to December in 2010, employed direct observation about helmet use among 945,956 randomly chosen motorcyclists (71.4% of which were drivers). These were identified at 3,252 selected sites comprising road intersections or road sections with slow traffic in urban and rural municipalities of varying sizes. The number and proportionate distribution of the selected sites (as percentages of the total sites for each category) of large, medium and small municipalities was: 1276 sites (32.9%), 560 sites (17.2%), and 1416 sites (43.5%) respectively. Between provinces, the number of sites varied from 22 to 84 according to area and number of population. For Bangkok, the capital city with a population of 6.9 million<sup>19</sup>, 100 sites were chosen (two for each of the total of 50 districts). Data about the number and percentage of helmet uses for each province were summarised and used for analysis (full detailed tables are available on request).

### B. Statistical analysis

A Pearson correlation matrix was applied to estimate the correlation between variables. Since the data were highly skewed, a cubic spline regression was applied to assess the relationship between predictors and the outcome<sup>20</sup>. The interested outcome was percentage of motorcycle helmet use whereas the predictors were police density and adult literacy. GPP, population density, and the number of policemen were not included in the model because these were highly correlated with police density which would cause multicollinearity.

The percentage of helmet use, police density and adult literacy were included in the spline regression with degrees of 0 and 3 (2 knots) for police density, and 0 (linear) for adult literacy. Goodness of fit of the model was checked. The predicted percentage of helmet use was then estimated and described for each province.

Apart from these relationships, we were also interested in assessing the relationship between police density and other predictors i.e., population density, adult literacy and GPP. In this regard, police density was treated as a dependent variable in spline regression analysis with population density, adult literacy and GPP included as independent variables.

All analyses were performed using STATA version 12.0. A p value <0.05 was considered as statistically significant.

## RESULTS

For the whole country, the percentage of helmet use in drivers (53.3%) was higher than that in passengers (19.3%) (Table 1). Regional comparison revealed the highest percentage of helmet use by both drivers (93.0%) and passengers (45.2%) in Bangkok, which was two folds of the lowest figure in the North for drivers and almost five folds of the lowest figure in the South for passengers. Except for the population to police ratio (562.9 persons per police), Bangkok has the highest population density (1330.4 persons per square kilometer), the highest GPP per capita (361,243 baht per capita) and the highest police density (13.09 policemen per square kilometer) compared to other regions in 2010.

Using province specific data for the whole country, the percentages of helmet use in both drivers and passengers were significantly correlated to the number of police ( $r=0.3613$ ), police density ( $r=0.5121$ ), population density ( $r=0.5864$ ) and GPP ( $r=0.4944$ ) (Table 2). In the same table, police density has been shown to be highly correlated to population density ( $r=0.9515$ ) and GPP ( $r=0.9074$ ) at a statistically significant level ( $p<0.001$ ).

Using spline regression analysis, it was found that police density was independently the strongest predictor of helmet use at  $p < 0.001$  (Table 3). Again with spline regression, population density and GPP were found to be independent and significant predictors of police density at  $p < .01$  (Table 4).

## DISCUSSION

Evidence has shown that careful planning in policing, could reduce road crashes by an accumulated effect of 12% of all severities and 15% of all fatal crashes with low levels of police enforcement and sustained effects<sup>21</sup>. Numerous attempts have been made to increase the effectiveness of police enforcement in reducing traffic accidents<sup>22,23,24</sup>. Most attempts involved increasing police presence. Even for program designs for which accident reductions have been convincingly demonstrated, the drawback has been that the increased police presence required tends to be difficult to sustain, especially in an environment of public expenditure restraint. For this reason, any increase in police presence tends to be only short term (a 'blitz') and any accident reduction achieved is not maintained<sup>25,26</sup>.

Unsustainable presence of police activity might reflect an inadequate number of police officers, which are required to serve a wide range of police services including traffic policing. For police services in general, the UN recommended population to police ratio is 450:1<sup>27</sup>. Based on this figure, the ratio in Thailand as a

whole, (541.3:1 as shown in Table 1) could be considered inadequate. Nevertheless, our finding did not support the association between helmet use and population to police ratio ( $r=0.1886$ ,  $p = 0.1028$ ). We found police density as defined by the number of police per square kilometer to be independently and significantly associated with the percentage of motorcycle helmet use after controlling for the confounding effect of adult literacy.

The association between police density and helmet use could be interpreted as an association between spatial and temporal coverage of police surveillance activity and helmet use. This interpretation was consistent with findings from experimental studies linking speed reduction with deployment of single stationary police vehicles at random times to randomly chosen sectors of specific rural highway sections<sup>28</sup>. The result of the experiment was an average speed reduction spread of effect per patrol of 22 km/hr which was some four times greater than those demonstrated by Smith (1962, cited in Edwards and Bracket, 1978<sup>28</sup>). Further trials, with a similar approach, in Queensland Australia, demonstrated the average crash reduction for fatal crashes was 31%<sup>21</sup>. With an average program-wide fatal crash coverage of 51%, the program reduced the aggregate of the seven regions' fatal crashes by some 16%, and that of the entire state of Queensland by 15%.

For a macro policy decision, the linkage between police density and motorcycle helmet use implies that allocation of the police force should take into account deployment strategies to ensure spatial and temporal coverage of police services. In contrast, seeking to meet the UN's recommended ratio could hardly be achieved, especially for resource poor countries.

Ideally, distribution of police should be guided by a need to ensure an adequate level of law enforcement on helmet use. With this argument, provinces with a low helmet use rate would require higher numbers of police in terms of police density. In fact, the opposite situation seemed to be the case. There was a huge disparity in police density between the highest figure (13.09 per square kilometer) in Bangkok and the lowest (0.19 per square kilometer) in the central region with a ratio of 68.9:1 (Table 1). This ratio was much larger than that (2.1:1) between the highest helmet use rate of 93.0% in Bangkok and the lowest of 44.8% in the northern region. Since police density is positively linked to population density and GPP (Table 5), it is understandable that the existing allocation of the police force in Thailand has been biased toward the rich urban communities. In addition to the highest percentage of helmet use, the lowest case-fatality rate (1.8%) of road traffic injuries has been documented in Bangkok since 1995<sup>3</sup>. These facts have strongly indicated a need for more equitable

distribution of the police force in Thailand using an evidence-based approach.

Based on our findings, the level of motorcycle helmet use (93%) in Bangkok might be adopted as a protective threshold for head injuries to guide better distribution of the police force, so that sufficient coverage of law enforcement on helmet use could be met throughout the country. This does not mean that the number of police should be increased in regional provinces to the density (13.09 per square kilometer) in Bangkok, since the magnitude of difference in percentage of helmet use between Bangkok and regional provinces, is a lot smaller than that in police density between the two groups as discussed.

Apart from considering the redistribution of the police force, there is a need to consider investment in police training to make use of state-of-the-art techniques in effective deployment of traffic policing activity as demonstrated in Queensland, Australia<sup>21</sup>. A unique feature of the Queensland approach was the deployment of a small number of police force randomly scheduled to randomly chosen road sectors of specific rural highway sections to provide widespread coverage resulting in long term (up to 3 years) reduction of road crashes of all severities. Hence, it is an interesting and promising approach to maximize the capacity of the existing limited numbers of police.

There are two major limitations of this report worth consideration. The first was the cross sectional design of the study could not support a conclusion of causal linkage between motorcycle helmet use or police density and the predictors. The other was that the relationship between the predictors and helmet use or police density might be confounded by other known confounding factors not included in this report. Nonetheless, this report provides a unique finding on the relationship between police density and helmet use from the results of a nationwide direct observation of the behavior of motorcycle helmet usage and of the existing national

datasets of potential predictors. The findings might be useful to guide a policy decision on the allocation of police force to meet the need for better enforcement of the helmet law and to address the equity concerns with resource allocation. Further studies are needed to better ascertain the relationship between helmet use and police density making use of a longitudinal study design with the inclusion of other relevant confounding factors.

## CONCLUSIONS

Using cubic spline regression analysis on national datasets, and the nationwide roadside survey of motorcycle helmet use in Thailand, this report has demonstrated that police density is an independent predictor of helmet use. Concerning policy decisions on resource allocation, the finding provides a new parameter for the allocation of limited numbers of police. Police density was also significantly associated with gross provincial product (GPP) per capita and population density. This additional important finding raises a concern about the equitable allocation of the police force in Thailand.

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### Conflicts of Interest

The authors declared no conflicts of interest.

## ETHICAL CLEARANCE

This report made use of secondary datasets hence there is no need for ethical clearance.

**Table 1 Percentage (range\*) of helmet use of motorcycle drivers and passengers and related factors by region in 2010**

Region(survey samples)	% helmet use		Population density (per sq km)	Population to police ratio	GPP per capita**	Police density (per sq km)
	driver	passenger				
whole country (954,956)	53.30	19.30	131.2	541.3	150,118	0.24
Bangkok (27,647)	93.00	45.20	1330.4	562.9	361,243	13.09
Central (289,654)	63.90(28.6-79.9)	24.40(6.2-31.0)	63.5	336.2	264,285	0.19
Northeast (247,821)	47.60(31.7-74.1)	19.80(9.5-56.6)	135.5	654.0	49,092	0.21
North (150,888)	44.80(33.2-61.4)	17.20(5.8-32.4)	129.9	427.7	79,158	0.30
South (238,946)	47.00(21.5-79.7)	9.40(1.8-50.6)	132.6	344.2	104,738	0.39

\* figures of province with the lowest and the highest percentage in each region

\*\* at current market prices in 2010

**Table 2. Pearson correlation matrix for factors associated with motorcycle helmet use (p value)**

	Helmet use	No. of police	Police density	Population to police ratio	Population density	GPP	Adult literacy
Seat belt	1.0000						
No. of police	0.3613 (0.0013)	1.0000					
Police density	0.5121 (0.0000)	0.9005 (0.0000)	1.0000				
Population to police ratio	-0.1886 (0.1028)	0.1569 (0.1758)	0.1729 (0.1353)	1.0000			
Population density	0.5864 (0.0000)	0.7976 (0.0000)	0.9515 (0.0000)	0.0371 (0.7502)	1.0000		
GPP	0.4944 (0.0000)	0.8802 (0.0000)	0.9074 (0.0000)	0.0404 (0.7287)	0.8603 (0.0000)	1.0000	
Adult literacy	0.1654 (0.1533)	0.0656 (0.5733)	0.1001 (0.3894)	-0.2887 (0.0114)	0.1478 (0.2028)	0.1288 (0.2674)	1.0000

**Table 3. Factors associated with percentage of helmet use according to spline regression analysis.**

Predictors	coef	SE	t	P>   t	[95% CI]	
Police density*	6.17	1.21	5.12	<0.001	3.77	8.58
(Police density-0.253) <sup>3</sup>	2.36	1.21	1.95	0.055	-0.05	4.77
Adult literacy	1.12	1.22	0.92	0.362	-1.31	3.54

\*number of policemen/area, CI=Confidence Interval, SE= Standard Error

**Table 4. Factors associated with police density: A spline regression**

Predictors	coef	SE	t	P>   t	[95% CI]	
Population density	0.28	0.08	3.560	0.001	0.12	0.43
(Population density- 164.7) <sup>3</sup>	0.38	0.05	7.297	0.000	0.28	0.48
GPP	1.23	0.08	15.194	0.000	1.07	1.39
(GPP- 8.7x10 <sup>4</sup> ) <sup>3</sup>	-0.67	0.05	-14.051	0.000	-0.76	-0.57
(GPP- 5.6x10 <sup>4</sup> ) <sup>3</sup>	0.05	0.02	2.777	0.007	0.01	0.09

CI = Confidence Interval, SE=Standard Error (Endnotes)

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# Progressive Ataxia in An 11 Year Child - A Case Report

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## ABSTRACT

Ataxia Telangiectasia is a primary immunodeficiency disease which affects a number of different organs in the body. It is characterized by ataxia, telangiectasia of the eyes and skin, a variable immunodeficiency involving both cellular and humoral immune responses and a predisposition to cancer. Here we present a case of ataxia telangiectasia in an 11 year child who presented with progressive ataxia.

**Keywords:** Ataxia Telangiectasia, Humoral Immunity, Immunodeficiency.

## INTRODUCTION

Ataxia-telangiectasia is an autosomal recessive, multisystem disorder characterised by progressive neurologic impairment, cerebellar ataxia, ocular and cutaneous telangiectasia, variable immunodeficiency with susceptibility to sinopulmonary infections, impaired organ maturation, x-ray hypersensitivity and a predisposition to malignancy. We report a patient of AT who presented with progressive ataxia.

## CASE REPORT

An 11 years female child presented with imbalance while walking on either side, slurring of speech with poor scholastic performance. These symptoms started when she was 5 years old and they are progressively increasing in last 5 years. No other neurological complaints. No H/o recurrent infections in the past. On examination vitals stable, clubbing present, bilateral bulbar conjunctiva and mucosal telangiectasia (fig.1&2). Neurological examination revealed dysarthria, incoordination of both upper/lower limbs, decreased deep tendon reflexes, plantar were extensor bilateral & ataxic gait. Ocular fundi were normal & rest of examination was normal.

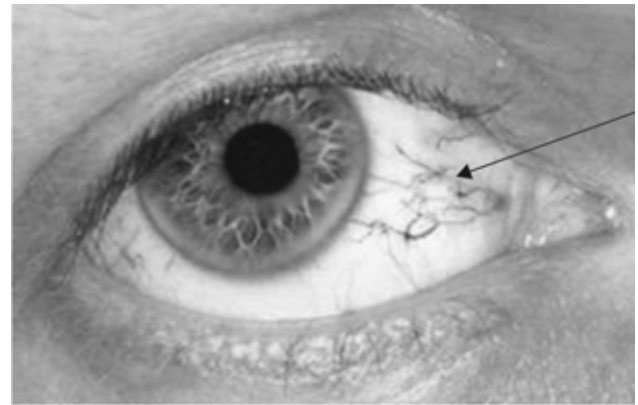


Fig. 1: Bulbar conjunctival Telangiectasia

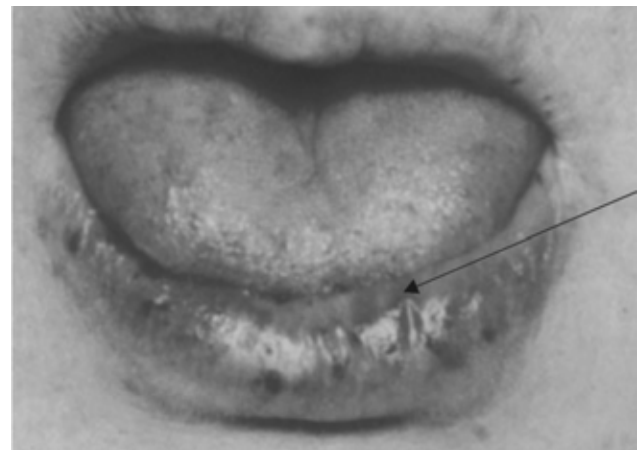


Fig. 2. Mucosal telangiectasia

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Laboratory investigations revealed complete heamogram, blood sugar, RFT, LFT, CXR were normal. MRI brain showed cerebellar atrophy (fig.3&4). Flow cytometry - Decreased Total Lymphocytes, markedly decreased CD4, decreased B cells with equal CD4/CD8 ratio. Immunoglobins - IgA- 0.19 g/L(0.5-3.5g/L), IgM-

37.5 g/L(0.45-1.5g/L), IgG- 12.7 g/L (8-15g/L), Alpha FP 159 microgms/L. In the view of progressive limb ataxia & telangiectatic lesions, started at first decade of life with defective immune system (both cellular & humoral) Ataxia telangiectasia was diagnosed.



Fig. 3. Cerebellar atrophy

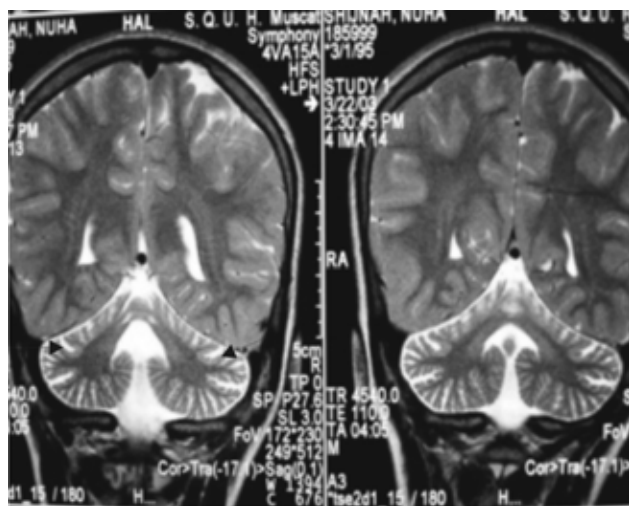


Fig. 4. Bilateral cerebellar atrophy

## DISCUSSION

Ataxia telangiectasia (AT) is a genetically determined autosomal recessive, multisystem disorder causing neuro-degeneration and immuno-logical abnormalities resulting in increased susceptibility to infection and malignancies, endocrine deficiencies, increased sensitivity to ionizing radiation and an anomaly of DNA repair<sup>1</sup>. AT occurs equally among the sexes and is reported in all races and in all parts of the world. The prevalence of this disorder ranges from 1 in 40,000 to 100,000 births<sup>2</sup>. Syllaba and Henner first described this condition in 1929<sup>3</sup>. Although AT is a

multisystem disorder, progressive neurological deterioration is the hallmark of the syndrome<sup>4</sup>. Neurological manifestations consist of ataxia, choreoathetosis, ocular movement abnormalities, mental retardation and dystonias. The ataxia manifests as the child starts walking while ocular telangiectasia is usually appreciated around 4-6 years of age. Vessels over exposed bulbar conjunctiva become prominent and appear fan shaped. Choreoathetosis is the commonest extra pyramidal feature present in 90% of cases<sup>5, 6</sup>. Dystonia usually develops as a late manifestation and has been reported in 71% of patients<sup>7</sup>. Non-neurological features vary and include vasculo- cutaneous, immunological, and neoplastic manifestations. The characteristic telangiectasias usually appear later than ataxia, typically at around 3 to 6 years of age in the region of the conjunctival angles of the eye. Once present, they steadily progress and spread in a symmetrical pattern across the exposed portion of the bulbar conjunctivae. These telangiectasias are bright red horizontal streaks that cause the eyes to look "bloodshot" and eventually involve the rest of the conjunctivae, eyelids, adjoining facial regions, external ears, neck, and antecubital and popliteal spaces. Rarely, the telangiectasias may be present on the dorsum of the hands and feet and on the mucosal surfaces of the palate. These abnormal vessels are not symptomatic and appear to be of venous origin, branching from subpapillary venous plexuses in the skin and dilated connecting venules in the conjunctivae. AT pts have frequent sinopulmonary infections<sup>8,9</sup>. These may range from infection of the ears, nose, and sinuses to chronic bronchitis and recurrent pneumonia. The predisposition to infection is associated with the presence of an abnormal thymus and a marked deficiency of IgA, which is the predominant immunoglobulin in respiratory secretions. Neoplasms occur in an estimated 10 to 15 percent of patients with AT and are second only to pulmonary disorders as a cause of death. The most common neoplasms include Hodgkin's disease, malignant lymphomas, reticulum cell sarcoma, and histiocytosarcomas. The laboratory evaluation of patients with AT reveals normal results on routine studies of the urine, blood (except for lymphopenia), and spinal fluid. Elevations in serum alpha-fetoprotein and plasma carcino- embryonic antigen are typically, but not invariably, present and are not required diagnostic criteria. Humoral or cellular immunological defects are also helpful in the diagnosis of AT, including low or absent levels of IgA, IgG2, and IgE, yet these are not invariable. Plain films of the skull may show decreased or absent nasopharyngeal adenoidal tissue,

and CT and MRI studies of the head show cerebellar atrophy. Muscle and nerve biopsies may reveal evidence of denervation atrophy and axonal degeneration, respectively. Treatment of patients with Ataxia telangiectasia is supportive and includes treatment of infections and the use of sunscreens to retard the cutaneous progeric changes<sup>2</sup>. Early institution of pulmonary physiotherapy and physical therapy is important. Prenatal diagnosis is possible through the measurement of alpha-fetoprotein levels in amniotic fluid and the documentation of increased spontaneous chromosomal breakage of amniotic cell DNA.

### CONCLUSIONS

Ataxia telangiectasia is a rare entity with varied multisystem manifestations. Progressive neurological deterioration is the hallmark of the syndrome. Clinical suspicion of Ataxia telangiectasia should be done when an individual presents with progressive ataxia, ocular and cutaneous telangiectasia.

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# Prevalence of Asymptomatic Bacteriuria among Pregnant Women and its Association with Pregnancy Outcome

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## ABSTRACT

**Objective:** To study the prevalence of asymptomatic bacteriuria (ABU) in pregnant women & its association with pregnancy outcome.

**Method:** A Descriptive Study (Cross Section) was done in 800 antenatal women up to 28 weeks during the year 2009-2010. Urine culture was done after recording patient obstetrical, personal, past history, clinical examination. Out of which 48 (Group-A) found having ABU ( $>1 \times 10^5$  CFU/ml), while 752 (Group-B) were not having any bacteriuria. Both the Groups were further followed monthly up to delivery. At the time of delivery perinatal outcome recorded.

**Result:** Prevalence of ABU is 6% (48/752). E.coli (75%) was common pathogen followed by Staph.saprophyticus, Klebsiella. It is associated with increased risk of Symptomatic UTI as 12.5% bacteriuric & 2.93% non-bacteriuric women develop symptomatic UTI ( $p < 0.001$ ). ABU was found to be associated with Preterm Labour as 20.83% bacteriuric & 4.8% non-bacteriuric women have preterm labour ( $p < 0.044$ ). It is also associated with Low Birth Weight babies as 16.67% in bacteriuric & 6.12% non-bacteriuric women have LBW babies ( $p < 0.049$ ).

**Conclusion:** ABU is a common infection during pregnancy & it increases the risk of Preterm birth, Low birth weight babies & Symptomatic UTI.

**Keywords:** Asymptomatic Bacteriuria, CFU-Colony Forming Unit, E.Coli, Urinary Tract Infection, Preterm Labour.

## INTRODUCTION

Asymptomatic bacteriuria (ASB) is bacteriuria without apparent symptoms of urinary tract infection<sup>1</sup>. It is major risk factor for development of urinary tract infection. Asymptomatic bacteriuria affect all age group but woman particularly pregnant women are more susceptible than men due to pregnancy, short urethra, early contamination of urinary tract with faecal flora and various other reason. Urinary tract undergoes profound physiological and anatomical change during pregnancy facilitating the development of bacteriuria both symptomatic and asymptomatic in women<sup>2</sup>.

There are number of conditions associated with an increased prevalence of asymptomatic bacteriuria in pregnancy like low socioeconomic status, diabetes mellitus, grand multiparous women<sup>3</sup> etc. Each is associated with two fold increase in the rate of bacteriuria<sup>4</sup>.

Asymptomatic bacteriuria in pregnancy is associated with maternal and fetal complication. Maternal complication includes Preclampsia, Anemia,

Chorioamnionitis, acute cystitis, acute pyelonephritis. Fetal complication includes Intrauterine growth retardation, Intrauterine death, Low birth weight babies, Prematurity, Premature rupture of membrane etc<sup>5,6</sup>.

The present study was thus undertaken to estimate the prevalence of asymptomatic bacteriuria in pregnancy, its causative agent and its consequences in pregnancy.

## MATERIAL AND METHOD

800 antenatal women were screened for asymptomatic bacteriuria. Out of which 48 found having asymptomatic bacteriuria ( $>1 \times 10^5$  CFU/ml), while 752 were having sterile urine. All women were further followed up to the delivery of their babies.

All data thus calculated was charted, tabulated and analyzed statically. The different parameters were determined as Anaemia, Pregnancy induced Hypertension, Preterm labour and symptomatic UTI. Perinatal outcome of these pregnancies was also

studied, in the form of Low birth weight, IUGR, Birth asphyxia, admission to NICU and perinatal death.

20weeks) of gestation as compared to later gestation. Statically it is significant. (p<0.001).

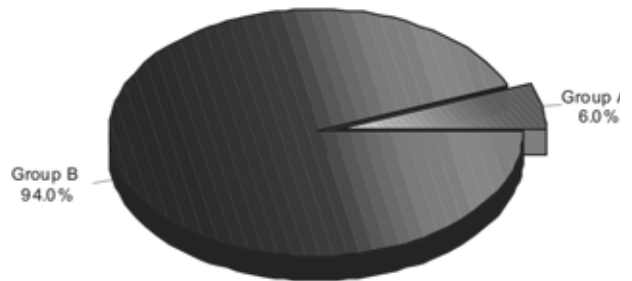
**RESULT**

In our study prevalence of asymptomatic bacteriuria was (48/800) 6% in pregnant women. The dominant bacteria were *E.Coli* 75% (36/48) followed by *Staph.Saprophyticus*, *Klebsiella* 25%(12/48). Ciprofloxacin was the most sensitive antibiotic for all the three species isolated. Tetracycline, Nitrofurantoin and Nalidixic acid were the other antibiotics explored for sensitivity. The sensitivity for different microbes ranged from 50% to 77.8% for these three antibiotics.

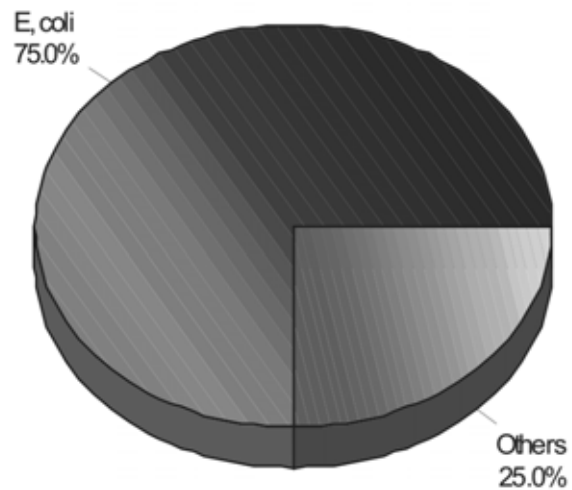
In our study there was no significant association found between ABU with Religion. While rural community show significant compositions (44/48). It is found that 79.2% of bacteriuric women was of upper lower class, and 54.5% of non-bacteriuric women were of this class. Statically it is found significant (p<0.002). So asymptomatic bacteriuria is more common in lower socioeconomic status. Maximum no of patients in both the study group were of age group 21-25 years, Thus asymptomatic bacteriuria was common in age group 21-25 years. Difference was not significant. (P=0.835)

Statistically, the group were matched parity wise. In bacteriuric women 4 patients were nulliparous (8.3%) & rest were multiparous. 100 patients in non-bacteriuric were nulliparous (13.3 %) & rest were multiparous. So asymptomatic bacteriuria is more common in Multiparous women. Statistically, there was a significant difference between two groups as regards the parity (p<0.001). Asymptomatic bacteriuria is diagnosed in maximum no. (58.3%) in early weeks (11-

**Prevalence of asymptomatic bacteriuria**



**Bacteria Growth on Urine Culture**



**Table 1. Demographic and Physical Characteristics**

S. No.	Characteristic	Group -A (n=48)	Group -B (n=752)	P
1	Religion			0.489
	Hindu	28	400	
	Muslim	20	352	
	Other	0	0	
2	Residence			0.876
	Rural	44	694	
	Urban	4	56	
3	Age			0.835
	<20	8 (16.7%)	140(18.6%)	
	21-25	20 (41.6%)	312(41.5%)	
	26-30	16 (33.3%)	260(34.5%)	
	>30	4 (8.4%)	40 (5.4%)	

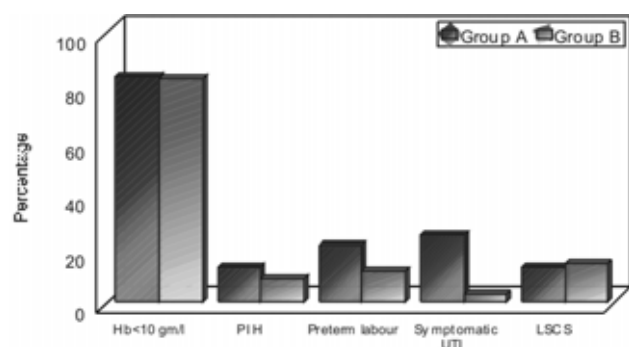
**Table 2. Maternal outcome**

S. No.	Characteristic	Group -A (n=48)		Group -B (n=752)		c <sup>2</sup>	P
Haemoglobin							
1	<10gm/l	40	83.33%	620	82.45%	0.025	0.875
2	≥10gm/l	8	16.67%	132	17.55%		
Pregnancy Induced Hypertension							
1	≥140/90 mm Hg	6	12.50%	66	8.80%	0.764	0.382
2	<140/90 mm Hg	42	87.50%	686	91.20%		
Preterm labour							
1	Preterm	10	20.80%	84	11.20%	4.063	0.044
2	At term	38	79.20%	668	88.80%		
Symptomatic UTI							
1	Present	12	25%	22	2.90%	54.028	<0.001
2	Absent	36	75%	730	97.10%		
Mode of delivery							
1	LSCS	8	12.5%	112	14.1%	0.111	0.739
2	Vaginal	40	87.50%	640	85.90%		

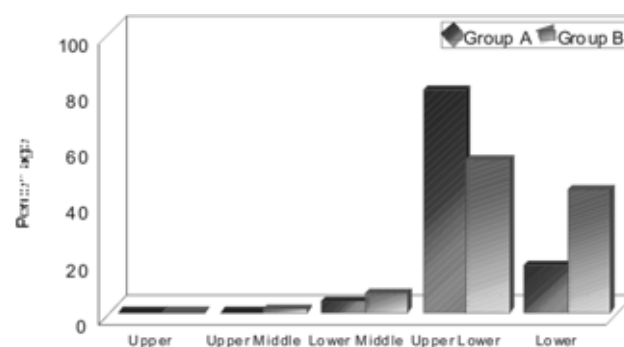
**Table 3. Perinatal outcome**

S. No.	Characteristic	Group -A (n=48)		Group -B (n=752)		c <sup>2</sup>	P
Birth Weight							
1	Birth weight <2.5 kg	12	25%	109	14.49%	3.879	0.049
2	Birth weight ≥2.5 kg	36	75%	643	85.51%		
Cause of LBW							
1	Preterm	10	83.30%	84	77.06%	1.763	0.834
2	IUGR	2	16.70%	25	22.94%		
1 min. Apgar Score							
1	<7/10	2	8.30%	60	7.90%	0.917	0.338
2	>7/10	44	91.70%	692	92.10%		
NICU admission							
1	Admitted	9	18.80%	77	10.20%	3.406	0.065
2	Not admitted	39	81.20%	643	89.80%		
Neonatal Mortality							
1	Alive	48	100%	748	99.40%	0.257	0.612
2	Stillbirth/IUD	0	0%	4	0.60%		

**Maternal outcome**



**Perinatal outcome**



### MATERNAL OUTCOME

In our study anaemia is considered if Hb is <10 gm/dl. 83.3% of bacteriuric women were anemic while 82.4% of non-bacteriuric was also anaemic. Statistically it is found insignificant. ( $p=.875$ ). On analysis hypertension found in 12.5% of bacteriuric (6/48) & 8.7% of non-bacteriuric women (66/376). Statistically it found insignificant. Incidence of symptomatic UTI was significantly higher in bacteriuric (25%) as compared to non-bacteriuric women (2.9%) ( $p<0.001$ ). 20.8% (10/48) of bacteriuria women found develop preterm labour <37 weeks of gestation while 4.8% (36/752) of non-bacteriuric group experience preterm labour pains. These finding are statistically significant ( $p<0.044$ ).

### PERINATAL OUTCOME

The incidence of low birth weight was significantly higher in bacteriuric (12/48) 25% as compared to non-bacteriuric (109/752) 14.49%. It is found statically significant ( $p<0.049$ ). No association found between IUGR and asymptomatic bacteriuria. Birth asphyxia, NICU admission, neonatal mortality is not associated with asymptomatic bacteriuria in both groups.

### DISCUSSION

In present study, prevalence of asymptomatic bacteriuria was (48/800) 6% in pregnant women, and *Escherichia coli* (75%) is most dominant causative organism followed by *Staphy. saprophyticus* and *Klebseilla*, Ciprofloxacin was the most sensitive antibiotic for all the three species isolated. Tetracycline, Nitrofurantoin and Nalidixic acid were the other antibiotics explored. These finding coincides with Aziz Marjan<sup>7</sup> Khattak, Salim Khattak<sup>8</sup> et al. prevalence i.e. 6.2% in local population of Karachi in 2002 with *E. coli* (38.89%) in maximum concentration. Naheed fatima & Shabnam ishrat et al<sup>9</sup> found lower prevalence i.e. 4.8% among local population of Bahawalpur with *E. coli* (78.6%) in dominant number.

No association was found with Religion and Residence, but significant numbers of patient were in lower socioeconomic status. Other investigator justify us as Peggy J Whalley<sup>8</sup> states that variations appear to be related to socioeconomic status & women with ABU studied. The highest prevalence is found in women attending public clinic for indigent women.<sup>10,11,12</sup> Turck

Goffe and Patersdorf specifically studied the influence of socioeconomic factor on pregnancy bacteriuria.

No significant correlation found with ABU and Age of patient. But maximum no of multiparous women were present in bacteriuric group. Diverse opinion exists when age, parity was examined. First trimester women were significantly found to be affected by bacteriuria Nerissa Isabel C. Etal. Agrees with us as they said multiparity is associated with bacteriuria in pregnancy, earlier the gestational age the greater the likelihood of bacteriuria. Some investigator claimed that neither age nor parity influences the prevalence of maternal ABU. Henderson, M.<sup>10</sup>, Entwisle, G., and Tayback. M. Hoja.<sup>13</sup>

In the present study no significant association of ABU was found with Anaemia and PIH. but Asymptomatic bacteriuria have significant correlation with development of Preterm labour and Symptomatic UTI. Kincaid - Smith and Bullen<sup>12</sup> noted that 37% patient of asymptomatic bacteriuric women develop symptomatic UTI as compared to non-bacteriuric women. Similar findings are showed by Naheed Fatima, Shabnum ishrat et al<sup>9</sup> that bacteriuria was found to be causative factor for preterm labour.

The incidence of low birth weight was significantly higher in bacteriuric women. No association found with Birth asphyxia, neonatal admission and neonatal mortality. Urinary tract infection has also been implicated as a risk factor for adverse perinatal outcome of premature birth and/or low birth weight as stated by Kass EH., LeBlanc AL, et al.<sup>7</sup>

### CONCLUSION

This concludes that Asymptomatic bacteriuria is a common infection during pregnancy and it greatly increases the risk of Symptomatic UTI, Preterm labour & Low birth weight babies. Association of asymptomatic bacteriuria with anaemia, PIH, IUGR babies was statically insignificant.

Screening with a single urine test could detect most cases of bacteriuria. There is a strong evidence to recommend that screening of bacteriuria should be a routine at antenatal clinics and appropriate treatment should be provided. Screening and treatment of bacteriuria is likely to be cost effective.

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# A Study of the Prevalence of Gonorrhoea among High Risk Population in Hyderabad, A.P

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## ABSTRACT

**Background:** Gonorrhoea is now mainly seen in homosexual men and sexually active individuals, who are more vulnerable to STIs and HIV. High prevalence among them is due to presence of large reservoirs of asymptomatic carriers. Early detection and treatment of STIs has been advocated as HIV prevention strategy. This study was carried out to detect the prevalence of gonorrhoea among the risk groups.

**Methods:** MSM and FSW attending sentinel STI clinics for regular checkups or symptoms were screened for study eligibility. Heterosexual men attending STD OP at Gandhi Hospital with urethritis were also included. A behavioral questionnaire was administered, clinical examination performed and laboratory samples were collected. We also determined the proportion of asymptomatic infections among sexual workers. Culture and NAAT was performed on all specimens.

**Results:** During a period of 1 year, 183 MSM were tested for pharyngeal and rectal gonorrhoea and positive percentages were 1.09 % and 11% respectively. Among 125 FSW, 18.4% were positive and among 50 heterosexual males, 40% were positive for urethral gonorrhoea. Younger age, number of sexual partners in past month, irregular condom usage and rectal, urethral symptoms were associated significantly with the infection. Sensitivity, specificity, PPV and NPV of culture compared to NAAT were 31%, 99.6%, 95% and 86% respectively.

**Conclusion:** Prevalence of infection, sexual behavior and the asymptomatic nature among sexual workers are alarming, serving them as reservoirs for gonorrhoea. So screening them at anatomical sites based on exposure history should be considered.

**Keywords:** Men having sex with men (MSM), Female sex workers (FSW), Heterosexual men.

## INTRODUCTION

Sexually Transmitted Infections (STIs) are a major public health issue worldwide because of their severe consequences for millions of men, women and children (World health organization 2001, 2007).

FSW and MSM are the key for STIs transmission dynamics because their partners are from different groups in the population. Their vulnerability to STI results from a high rate of partner exchange, unprotected sex and lack of access to health services<sup>1-5, 10</sup>. These groups are stigmatized and hard to reach population which affect surveillance and research on STIs.<sup>6, 7</sup> Considerable epidemiological data exists showing that gonorrhoea and other STIs facilitate HIV transmission<sup>8,9,15</sup>.

*Neisseria gonorrhoeae* has accumulated mechanisms of antimicrobial resistance so that from the year 2007 it joined the list of multi-resistant,

informally called “Superbugs” (Shafer-In Neisseria Molecular Mechanisms of Pathogenesis, 2010). It is likely that for MSM seeking care in private clinics, pharyngeal and rectal gonorrhoea cultures are not being done. So it becomes important to screen for STIs such as gonorrhoea among these major bridging population<sup>11,12,13</sup> due to their asymptomatic nature<sup>16,17</sup> as also suggested by CDC<sup>14</sup>.

## MATERIAL AND METHOD

A Cross sectional study conducted to detect the prevalence of gonorrhoea among MSM and FSW attending sentinel STD clinics in Hyderabad and heterosexual Males attending STD OP at Gandhi hospital during Nov 08 to Oct 09. Sentinel STD clinics were chosen based on geographical location, patient population characteristics and clinic volume. Throat and Rectal swabs from MSM, Endocervical swabs from FSW and Urethral swab from heterosexual Males were collected.

**Inclusion Criteria-** MSM and FSW above 18years who were attending sentinel STD clinics either for routine STI testing or with symptoms, reporting anal or oral sex in past one year and during previous one month among MSM and Symptomatic heterosexual males attending STI OP at Gandhi Hospital.

**Exclusion Criteria-** Recipients of any antibiotics in previous 4 weeks, those declining to participate in the study and Females in their menstrual phase.

After obtaining informed consent from all participants, a questionnaire was administered on number of sexual partners and sexual behavior in preceding month and year and their symptoms. Three swabs were collected from each patient for Direct Microscopy, Culture (bed side inoculation on Modified Thayer Martin medium incubated in candle jar) and Gen -Probe APTIMA assay (APTIMA GC Assay - a second generation NAAT which utilizes transcription mediated amplification). All samples were processed by standard bacteriological techniques. Cultures were confirmed by standard biochemical tests and Phadebact Monoclonal Coagglutination (by Boule Diagnostic AB, Sweden). ATCC 49226 was used as control strain as recommended by CLSI. APTIMA Assay was done according to manufacturer’s instructions.

**Ethical approval** – Study was approved by ethical committee of Gandhi Medical College and Hospital, Hyderabad.

**Statistical analysis-** differences in percentages were statistically compared and tested for significance by p values calculated by chi square test.

**RESULTS**

During the course of study 183 MSM, 125 FSW and 50 heterosexual males were enrolled. Among MSM, prevalence of pharyngeal gonorrhoea was 1.09% (95%CI; 0.41 to 2.59) and rectal gonorrhoea was 11% (95%CI; 6.47 to 15.53). Among FSW, it was 18.4 % (95%CI; 11.61 to 25.19) and urethral gonorrhoea among heterosexual males was 40% (95%CI; 26.42 to 53.58).

**Among MSM:** Mean age at enrollment was 29yrs. Among them, 32% were married, 30% were illiterates. Positivity was higher among those reporting e”3 sexual partners (14.6% of 71% ; p= 0.03) and in those with irregular condom usage in the past month than those not reporting this (3.5% of 31.14% regular condom users, 15% of 69% irregular condom users were positives, p=0.023). 89% were asymptomatic at the time of presentation. Sore throat had no consistent association with positive pharyngeal gonorrhoea test unlike rectal discharge for rectal gonorrhoea as

represented in Table 1. Table 2 details the distribution of gonorrhoea by anatomic site.

**TABLE 1: Association of symptoms with the infection**

Symptoms	Total No	No (%) With Gonorrhoea	No(%) Without Gonorrhoea	
Sore throat				P = 0.7
Present Absent	9174	9 (4.9%) 172(95%)	02(1.2%)	
Rectal discharge				P = 0.02
Present Absent	11172	7(63.3%) 156(90.7%)	4(36.3%) 16(9.3%)	

**TABLE 2: Distribution of gonorrhoea by anatomic site (n-183)**

Type(s) Of Infection	No(%) Of Subjects
Rectal only	19 (10.38%)
Pharyngeal only	1(0.55%)
Rectal and Pharyngeal	1(0.55%)

**Among FSW:** Mean age at enrollment was 31.5yrs. Among them 55% were married, 84% were illiterates. Positivity was higher among those reporting e”3 sexual partners (10% of 43.5% having <3 partners, 29.2% of 56.5% having e”3 sexual partners; p=0.01 ) and in those with irregular condom usage in the previous month than those not reporting this (12% of 52% regular condom users, 26.6% of 48% irregular condom users were positives, p=0.03). There was a significant statistical association between symptoms and the presence of gonorrhoea (p=0.002). 32% were symptomatic at the time of presentation, most common being vaginal discharge followed by lower abdominal pain, of whom 35% were positive.

**Among heterosexual men:** Mean age at enrollment was 30yrs, 12% were illiterates and 64% were married. 60% had history of promiscuity, of whom 63.3% had infection (p = 0.01). 84% were using condoms irregularly, of them 47.6% were positive (p= 0.01). Of the symptomatic males, 92% had urethral discharge, who were more likely to have the infection (65%, p=0.002).

The sensitivity, specificity, PPV and NPV of culture compared to NAAT were 30.8%, 99.6%, 95.23% and 86.6% respectively. (P =<0.001).

**DISCUSSION**

This study indicates rectal gonorrhoea(10.92%) is more common than pharyngeal gonorrhoea(1.09%) among MSM, serving as important reservoir at genital sites. pharyngeal gonorrhoea were most often asymptomatic with no significant relation with sore throat whereas, rectal gonorrhoea was more in patients with rectal symptoms<sup>18</sup>. Our study supports the previous

studies that have found rectal more common than pharyngeal gonorrhea<sup>16,19</sup>. This may be explained by asymptomatic nature of pharyngeal infection in contrast to rectal and due to clinician's unawareness on the need for gonorrhea screening of this site. Most of the MSM are socially shy in accepting their sexual behavior. But their identification is important as they play a role in spread of STDs in vast number of partners. The profile of STDs may also differ in MSM, which makes it all the more important to identify them. Male rectal gonorrhea is said to be a marker of unprotected anal intercourse<sup>20</sup>. Therefore, it has been suggested that a rectal and pharyngeal swab should always be taken in all MSM as these sites harbor silent infection<sup>21</sup>.

In a study conducted in Australia among MSM, 3.05% tested anal gonorrhea positive and 1.83% tested pharyngeal gonorrhea positive.<sup>22</sup> In a study by PD Ben pharyngeal and rectal gonorrhea were 7.3%<sup>18</sup>. Prevalence of gonorrhea in MSM in some of the other studies such as conducted by Gurung et al was 13.8%<sup>23</sup>, Taru Garg was 12%<sup>21</sup>, Nandi et al was 23%<sup>20</sup>. In a study by Beena Thomas et al, rectal gonorrhea was 4.7%<sup>24</sup>. The results in western studies have been slightly different. In a study on MSM attending the primary health clinic in Boston, gonorrhea was diagnosed in 25%<sup>25</sup>. In another study in Jakarta, gonococcal test positivity was present in 17%.<sup>26</sup> Similar rise in the prevalence of gonorrhea has also been pointed out by Truong et al<sup>27</sup>

In the present study, prevalence of gonorrhea among FSW was 18.4% which correlated with other studies such as in Hyderabad and Mumbai during 2008-14%<sup>28</sup>, in Surat, Gujarat -17%<sup>29</sup>, in Goa -8.9%<sup>30</sup>. Our study has inferred that prevalence of gonorrhea in sex workers is common in young age group, those having high rates of partner acquisition (e"3) in previous month and in those having unprotected sex<sup>16,19,31,9</sup>. There is a need for integrated services for sex workers such as peer education, condom promotion and effective treatment for STIs. These along with structural interventions have demonstrated reduction in STI and HIV prevention<sup>32,33</sup>.

There were higher rates of infection (40%) among heterosexual men attending regular STD clinic in our study. It was more in 25 to 30yrs age group with promiscuous behavior, unprotected sex and predominantly presented with urethral discharge similar to the study conducted by Shilpee et al<sup>34</sup>. The prevalence was comparable with studies conducted by CM Gupta et al in 2001-64%<sup>35</sup>, GS Bhatambare et al in 2001-60%<sup>36</sup>, Becker.M et al 2010-35%<sup>37</sup> and unlike by Shilpee et al in 2008-13% and Taru Garg from 2004-2010 where it was 4.1%.

We also found that NAATs was superior to culture especially for extragenital sites in MSM as with the other

studies<sup>38, 39</sup>. This study was a clinic-based study conducted at known high STI prevalence sites; hence, the STI prevalence cannot be generalized to other sex work sites in India.

## CONCLUSION

Prevalence of infection, sexual behavior and the asymptomatic nature among sexual workers are alarming serving them as reservoirs for gonorrhea. Our findings highlight the need for routine screening for gonorrhea among sex workers and for pharyngeal and rectal gonorrhea among sexually active MSM. Screening is critical for sexual health of sex workers and to prevent HIV transmission. There is a need to educate them about STIs and protected sexual practices.

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# Development of One Day Refresher Training Course for Primary Health Care Workers on Integrated Management of Neonatal and Childhood Illness (IMNCI)

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## ABSTRACT

Decline in knowledge and skills after Integrated Management of Neonatal and Childhood Illness (IMNCI) training substantiate the introduction of refresher training. The course structure of refresher training remains an area of discussion. The present study is an effort to construct and pilot test the refresher IMNCI training course for primary health care workers.

**Methodology:** Based on the public health experts' opinion, one day refresher training was given to trained workers in standard IMNCI training of district Panchkula, Haryana.

**Results:** As planned, one day refresher training was conducted from 9 AM to 5 PM for 76 participants in four batches. It included reading of treatment chart booklet followed by video demonstration and case study. Group discussion was conducted at the end of each session. One role play was performed by the participants.

**Conclusion:** Authors observed that it is possible to construct and implement the refresher IMNCI training course primary health care workers.

**Keywords:** Refresher Training, IMNCI.

## INTRODUCTION

Integrated Management of Neonatal and Childhood Illness (IMNCI) strategy developed to address the limitations of disease specific child health programmes to reduce child mortality.<sup>(1,2,3)</sup> One of the key strategy of IMNCI is training of primary care workers and medical officers in identification, management and referral of neonatal and childhood illness. In India, village level health functionaries are Auxiliary Nurse Midwife (ANM) and Anganwadi Worker (AWW). Government of India recommends standard 8-day training package to train health care workers for management of childhood illness. Studies documented that improvement was followed by deterioration of knowledge and skill of health care workers in

management of childhood illness after the training.<sup>(4,5)</sup> Supportive supervision and refresher training is necessary to sustain the knowledge and skills. However, course duration and contents for the refresher training remains an area of discussion. The present study is an effort to construct one day refresher IMNCI training course for primary health care workers.

## METHOD

Physicians trained in IMNCI with relevant experience were identified and meetings were organized to prepare the refresher course. They went through the standard IMNCI training modules and video clips used for standard IMNCI training for health workers. Each section of IMNCI module, treatment chart, photographs, and video clip were read and discussed among the experts. Time required reading the module was recorded and documented. A draft of refresher training course for one day was proposed by the experts after series of meeting. The training course was pretested by training of batch of primary care workers for one day. Trained workers in standard IMNCI training of district

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Panchkula, Haryana were trained in refresher training course. The workers were deputed by the state health services for refresher training.

## RESULTS

### Participant's characteristics

The mean age of all participants was 38.8 years and the mean age ANMs was 38.1 years (SD-6.1years), Anganwadi Workers was 39.9 years (SD-6.4years). It was observed the mean age of two groups was similar (P=0.74). The mean years of service were 15.9 years SD-6 Years. Most of the health workers completed matric education.

### Refresher training course

Refresher training program of one day was developed and finalized by the experts. Course curriculum was revised after each batch of training as per the feasibility and finalized (table 1). Training of batch was facilitated by two facilitators trained in IMNCL.

One day refresher training started in the morning at 9:00 AM with registration of participants. Total 76 Participants were trained in four batches of one day duration with average size of 19 per batch. All participants were trained in single classroom and entire training was classroom based. Training time was from 9:00 AM to 5:00 PM with lunch break for half an hour, and tea was served during the training session to utilize the time. Video demonstration, exercise and treatment chart booklet was used during the refresher training. Participants were asked to read the section from treatment chart booklet followed with video demonstration and exercise. Group discussion along with wall chart reading was also carried out after each section. Case studies from the working field were discussed after each section to maintain attention span of the trainees. Young infant (0-2 month) was covered in forenoon session; whereas sick child (2 month to 5 year) was covered after lunch session. Participants were asked to fill IMNCL Performa to identify, classify and treatment based upon video based exercise. A single role play for counseling of the mother was also conducted at the end of the training.

Hours	Section: Treatment Chart Booklet (Reading and Discussion)	Video (Exercises and Discussion)
9:00-9:30	Registration and Feedback	
9:30-11:00	Knowledge and Skill Assessment	
11:00-11:30 AM (Tea Break)		
Young Infant (0-59 Da ys)		
11:30AM-12:10	PSBI (Assessment, Classification and Treatment)	Possible Spontaneous Bacterial Infection Identification Exercise: Respiratory rate Counting (1) Chest Indrawing (2)
12:10-13:00	Diarrhoea, Breast Feeding (Assessment, Classification and Treatment) Chart Reading Advice to Mother (Feeding Problem)	Diarrhoea Breast Feeding Good and Wrong Attachment
13:00-14:00	Lunch	
Child (2 months to 5 year)		
14:00-15:10	Pneumonia, Diarrhoea (Assessment, Classification and Treatment)	Danger Signs Exercise: Count Respiratory rate (1) Chest Indrawing (2) Diarrhoea and general condition Exercise: Sunken Eyes, Skin Turgor
15:10-15:20	Tea Break	
15:20 to 15:40	Fever, Malnutrition (Assessment, Classification and Treatment)	Neck Rigidity, Anaemia, Malnutrition (Exercise)
15:40-16:15	Chart reading Treatment of Child Advice to Mother (Malnutrition) Immunization	Jenny Classification (Exercise)
16:15-17:00	Role Play for All common childhood illness	

## DISCUSSION

IMNCI training showed significant improvement in knowledge and skills of health worker in childhood diseases diagnosis and management.<sup>4</sup> Studies showed depreciation of knowledge and skill with the passage of time after the training<sup>4,5</sup>. Studies showed that after refresher training the knowledge and skills of primary health care workers was improved<sup>6</sup>. Globally, IMCI has been shown to improve child health care at first level but poor adherence to the guidelines has also observed<sup>7</sup>. Immediate follow up visits are necessary in order to avoid attrition of knowledge and skills. After the trainings follow up is required in terms of ongoing supportive supervision in order to helping health worker to consult manuals during child assessment in clinics. Study done in a district of Panchkula also showed that there was significant reduction of knowledge and skills of primary health care workers after over a period time IMNCI training.<sup>8</sup>

Retention of knowledge depends upon training methodology and supportive supervision. Thereafter, booster dose of knowledge and skills is to be administered as refresher training. There is consensus about administration of refresher IMNCI training package to health care professionals, but little efforts are done to course contents and training methodology. Present study tried to prepare the course contents, training methodology and feasibility to train the health workers for one day.

IMNCI training is in expansion phase in India and refresher training along with supportive supervision need to be stressed in order to minimize the attrition in knowledge and skills. Authors observed that it is possible to train health workers for one day with operational modification in course contents in standard IMNCI training of 8 days.

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# Models of Supportive Supervision for IMNCI Implementation in Selected Districts of Bihar, Orissa and Rajasthan in India

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## ABSTRACT

Human resource insufficiency in the resource constraint countries like India insists that the existing human resources are optimally utilized. Supportive supervision is one such strategy to ensure retention of knowledge and skills of existing service providers for optimal implementation of any national health programme. The present study ascertained and documented various models of supportive supervision for implementation of Integrated Management of Neonatal and Childhood Illnesses (IMNCI) strategy, to reduce under 5 mortality, in terms of its feasibility, sustainability, effectiveness, success and limitation in selected districts of Rajasthan, Orissa and Bihar states in India. The comparison of IMNCI indicators one year after the initiation of supportive supervision had shown that three post natal visits by health workers within 10 days of birth increased by 11.3 %, 20.2% and 37.6% in the districts - Tonk in Rajasthan, Mayurbhanj in Orissa and Vaishali in Bihar, respectively. There was a marked increase in the referral rates for both young infants and sick children in these states. More focused and regular supervisory visits kept health workers motivated and led to better IMNCI indicators in Bihar as compared to Rajasthan and Orissa. Model of supportive supervision involving both internal and external agency was found to be more feasible, sustainable and successful.

## INTRODUCTION

India aims to reduce the under five mortality rate by two thirds between 1990 and 2015 under the Millennium Development Goals (MDG-4). Hence one of the very important goals of family welfare programmes is to bring down the infant and child mortality rates for improving child health in India.<sup>1</sup> Although India witnessed a decline in Infant Mortality Rate (IMR) of 50 per 1000 live births in 2008 from 68 per 1000 live births in 1990 still there are certain programmatic issues which need attention.<sup>2,3</sup> Improved child health is tried to be achieved through building knowledge and skills of health service providers as well as grass root level workers including anganwadi workers, auxiliary nurse midwives (ANMs), medical officers (MOs) and nurses by imparting training under Integrated Management of Neonatal and Childhood Illnesses (IMNCI) in India.<sup>4</sup> However, these skills would be lost with time if not practiced and reiterated by

supportive supervision<sup>5</sup>. The aim of the present study was to document various models of supportive supervision for IMNCI and ascertain the feasibility, sustainability, effectiveness, success and limitations in India

## METHOD

Models of supportive supervision were reviewed in district of Vaishali, Jaipur, Mayurbhanj. Three research teams (one for each state), including a faculty member and two post graduates from School of Public Health, Post graduate Institute of Medical Education and Research, Chandigarh, India visited Rajasthan in March 2009, Bihar in April 2009 and Orissa in November 2009 for five days. The districts visited by the team were Jaipur in Rajasthan, Vaishali in Bihar, and Mayurbhanj in Orissa. The state officials of Unicef and Directorate of Family Health and Welfare from government sector also accompanied the team during the visit.

Prior to the visits necessary permissions were obtained from the state level officials of government sector and the state UNICEF office. To ensure uniform collection of data research teams were sensitized for

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one day on the objective of visit. Standard terms of references for visit were prepared and given to the teams. Research teams gathered information on the number of district/blocks covered under IMNCI, type of supervision (external or internal agency), IMNCI training schedule (number of days of IMNCI training) of the workers, training for supervisors (two days follow up training), number of supervisors being provided with supervisory training, number of health workers being supervised. Work plan of the supervisors (number of visits planned for their respective villages in a month), records of the supervisors (work plan, supervisory report, supervisory form), records of health workers (record registers) and other reports for assessing the number and quality of the supervisory visits were also reviewed by the teams. Effectiveness of the supportive supervision was assessed by comparing the IMNCI indicators base line level with one year after the implementation of supportive supervision.

## RESULTS

The health personnel's who were involved in supportive supervision in district Vaishali in Bihar, Mayurbhanj in Orissa and Jaipur in Rajasthan. Brief details of supportive supervision as follows,

### BIHAR

IMNCI was implemented in 25 out of 38 districts of Bihar. It was in early implementation phase in most of the districts of Bihar, except Vaishali which was in consolidation phase (more than 90% training load completed). IMNCI programme was being supported technically and financially by UNICEF. Out of 25 districts, mechanism of supportive supervision had been initiated in 19 districts after the pilot study in the district Vaishali. Supportive supervision is by both internal (government) as well as external (UNICEF) agency.

At state level, a state monitoring cell had been established at State Institute of Health and Family Welfare (SIHFW) to strengthen IMNCI. State programme officer from Bihar State Health Society and members of State Quality Assurance Cell supervised the activities of IMNCI from the government side. State IMNCI consultant and Health officer of child survival were involved in supervising IMNCI from Unicef's Office. Similarly at district level, there was District Quality Assurance Cell (QAC) for monitoring all National Rural Health Mission activities including IMNCI. Officials for supervision included members of the Quality Assurance Committee (government), Child Survival Coordinators and District Extenders (UNICEF) at district level.

### District Vaishali, Bihar

There were 16 blocks in the district Vaishali. Supportive supervision was initiated in July 2006 and became functional from October 2006. UNICEF staff included an IMNCI supervisor at block level who was responsible for ensuring the completeness and quality of data and reporting to district IMNCI coordinator. These supervisors were of graduate level and had undergone training for IMNCI for 11 days (8 days basic and 3 days follow up training). Basic training had been given to 45 supervisors and follow up to 50 supervisors at the time of this study. Government staff included block extenders/ health educators/ IMNCI medical officers/ CDPOs as block level supervisors. Supervisors from government or UNICEF supervised health system supervisors i.e., MOs and LHVs at the PHC level, who further supervised grass root level workers like ANMs/ AWWs/ASHAs. Joint monthly review meetings of Unicef and government staff including health specialist (Unicef), IMNCI consultants, IMNCI medical officers, IMNCI supervisors were being conducted to strengthen the mechanism of supervision and data flow.

Supervisors supervised 10 Anganwadi Centers (AWC) and a fixed number of health workers (approximately 20) per month for which they were paid a fixed amount (Rs. 50) per worker supervised. Supervisors checked two forms i.e. Form 2A (for infant up to 2 months) and 2B (For children from 2 months to 5 years) during their supervisory visit. Supervisory visit was usually not planned and no micro planning for the visit was done in advance. It was of informed type i.e., prior information about the visit was being conveyed to health workers. Supervisor usually observed the interaction of mother with AWW and reported the feedback to higher authorities. State level supervisors also visited 10-12 AWCs in a month.

The Anganwadi worker at Anganwadi center prepares the monthly report in the prescribed format and submits to Auxiliary Nurse Midwife (ANM) at Sub center on last Wednesday of every month. ANM then compile and submit the report to the Medical Officer in Charge (MO I/C) of the Primary Health Center by first Tuesday of the coming month. Then Medical officer collects and compiles the reports of all Sub centers at PHC and a consolidated report was then shared with the district officials (Civil surgeon and District Programme Manager) at district health society. Similarly district level official shares the compiled report of all PHCs with the state officials (Consultant of maternal and child health of state health society) and finally with the Assistant commissioner of child health at MOHFW, Government of India.

## ORISSA

IMNCI has been implemented in 16 districts out of total of 30 districts. Out of these 16 districts two districts viz. Mayurbhanj and Koraput were in consolidation phase. A total of 600 supervisors had been trained for basic training and 530 supervisors for follow up training till the end of December 2009. There were different models of supportive supervision at block level. Free-lancer model included retired medical practioners, AYUSH (Ayuervaeda, Unani, Sidha and Homeopathy) doctors, private practioners etc who were trained for basic training and follow up training. In the second model NGOs facilitate the supportive supervision at block level. State trains the NGO staff for IMNCI supervision. These provide about 8-10 supervisory visits per month. In the third model ICDS supervisors and health supervisors were being trained in IMNCI. The area of supervision (AWC and Blocks) was divided equally among these supervisors.

### District Mayurbhanj, Orissa

In the district Mayurbhanj Supportive supervision was started in the year 2007. The Health and ICDS supervisors supervised around 5-6 Health workers/ AWW per month. Details of supervision were not readily available from Orissa. Challenges of supervision by middle level supervisors of Health and ICDS include long distances to travel, lack of mobility support, less motivation for work among workers and lengthy follow up supervisory formats.

**Table -1. Coverage, type and nature of supportive supervision in Bihar, Rajasthan and Orissa, India.**

IMNCI indicators	Bihar N=38N(%)	Rajasthan N=33N(%)	Orissa N=30N(%)
IMNCI Implemented	25(65.7)	33(100)	16(50.3)
Districts with supportive supervision	19(50)	4(12.1)	1(3.3)
Type of supervision (Internal/External)	Both	External	Internal
Number of health workers supervised per month	58-60: block level 20-24: State level	22-25: block level	NA
Duration of supervision (hrs)	1-2	1	1
Nature (Informed/Uninformed)	Informed	Informed	Both
Duration of training for supervisors (days)	11	11	11

## Rajasthan

IMNCI has been implemented in all the 33 districts in Rajasthan. In Jaipur supervision was done by the external agency. Here trained supervisors were post graduates from department of Home Science, University of Rajasthan, Jaipur. These supervisors had been trained for 3 days especially for supervision in addition to two days training. These supervisors supervised one to two health workers per day per block and around 22-25 health workers in a month. Supervisors checked the records, reports and the skills of the health worker along with the logistics availability. Supervisory visits were informed prior to the visit. Districts manager made the plan of the supervisory visit. Feedback of the visit was being shared after each visit with the officials at the district level. They also organized the meetings for coordination at village, sector and district level. The block co-ordinators work under the guidance of the identified faculty of Department of Home Science, University of Rajasthan, Jaipur. However, for day to day activities and for support they liaison closely with the RCHO and the Child Health Co-ordinators. The Department of Home Science, University of Rajasthan, Jaipur submit a monthly progress on IMNCI implementation in the district to RCHO and UNICEF.

**Table-2. IMNCI indicators one year after the implementation of the supportive supervision.**

IMNCI indicators	Viashali N(%)	Mayurbhanj N(%)	Tonk N(%)
3 PNC visits within 10 days of Births			
Base line (2006)	N=841	N=7066	N=1062
3 PNC visits	329(39.1)	3307(46.8)	598(56.3)
1 year after(2007)	N=5635 4321(76.7 )	N=13587 9213(67)	N=661 447(67.6)
P value	0.001	0.001	0.001
IMNCI Young Infants Referral			
Base line (2006)	N=230	N=6610	N=1043
	21(9.1)	344(5.2 )	90(8.6)
1 year after(2007)	N=8733 5115(58.6 )	N=5428 759(14 )	N=601 25(4.2 )
P value	0.001	0.001	0.001
Number of sick child referred			
Base line (2006)	N=2318	N=10755	N=2543
	98(4.2 )	556(5.2)	104(4.1)
1 year after(2007)	N=15646 4067(26)	N=12509 1204(9.7)	N=1267 51(4.0 )
P value	0.001	0.001	.099



## Coverage and Impact of Supportive Supervision

Bihar had more (50%) IMNCI districts with supportive supervision as compared to Rajasthan (12.1%) and Orissa (3.3%) as shown in table 1. In Bihar, the number and duration of visits per month were slightly higher than in Rajasthan. IMNCI indicators one year immediately after the initiation of supportive supervision in these states have shown a remarkable increase as shown in table 2. There was 11.3 %, 20% and 37% increase in three PNC visits within 10 days of births, in districts Jaipur, Mayurbhanj and Vaishali respectively which was statistically significant ( $p < 0.001$ ). Number of referral young infants and sick child assessed and referred also increased significantly ( $p < 0.001$ ) in district of Vaishali and Mayurbhanj. Even though in the district of Jaipur where there was no change in sick child referral but there was significant decrease with respect to young infant referral. The reason for poor referral in child component in Rajasthan could be due to poor supportive supervision and inadequate experience of supervisors.

## DISCUSSION

IMNCI in India was implemented in the year 2003 in three districts in pilot phase, since then different models of supportive supervision were being used in different states of India, but the impact and effectiveness of these supervisory models in implementing IMNCI was not available. This study has made an attempt to document and ascertain the role of supportive supervision in IMNCI implementation. The results of this study had shown that IMNCI indicators especially, three post natal checkups within ten days of birth of the child had improved significantly after supportive supervision of health workers. There were also significantly more referrals of sick young infants and sick children to health facilities after one year of implementation of supportive supervision.

Various studies had shown that the role of supportive supervision can have independent positive effects on the immunization coverage and systematic supervision using clearly defined and quantifiable indicators can improve service delivery considerably, at a modest cost<sup>7</sup>. Another study documented that intense supervision led to high provider performance in systematic influenza and pneumococcal vaccination coverage rates<sup>8</sup>

Model of supportive supervision had been a success as there was a collaborative action by UNICEF and Government of India. Vaishali model of supportive supervision in Bihar had been shown a greater improvement of IMNCI indicators, as IMNCI was launched very early in this and more than 90% of health

staff was trained. Bihar has an additional structure like the state monitoring cell which exists at the SIHFW to strengthen IMNCI. The state and district quality assurance cell are also set up, to monitor all the activities under NRHM including IMNCI. The other initiative that had led to successful implementation was availability of IMNCI supervisors at each block.

In Orissa supportive supervision was started in 2006 but still there are major challenges which hinders the rolling out of the strategy successfully. There are managerial challenges which include lack of human resources, logistics and mobility support. However this district had been performing better than Rajasthan.

In Rajasthan supportive supervision by external agency had been observed that in district of Jaipur. Sustainability of the supportive supervision by model of external agency remains questionable. Some of the studies also showed that external agency not a effective Tool. That was reason this model was failure in childhood component. Supportive supervision is different from the traditional supervision.<sup>6</sup> The work of a good supportive supervisor was to assess certain things like whether the health workers are provided with a book chart, essential equipments and drugs, case sheets, able to identify diseases and treat them, visiting homes in an efficient manner and entering data in the case sheets correctly including the immunization status of the children. It had been shown in a case study in Andhra Pradesh, that outsourcing of supportive supervision has lead to more enthusiastic response and hence better result.<sup>9</sup> In Bihar contact of health workers with supervisors was more frequent, so they could able to share their problems more frequently and solve it more promptly. That was why performance of the health workers in terms of following the IMNCI guidelines in managing children was better. Motivation among health workers as well as among the caretakers was also more in Bihar than in Rajasthan. Studies done in Kenya and Guinea have shown that more frequent the contact with the supervisors; the earlier the problem is solved<sup>10</sup> In Bihar the number and duration of supervisory visits per month was also higher than in Rajasthan. The type of visits in both the districts was informed. The advantages of informed visits are that, all the health workers can be met at a specific time and place by arranging for a get together on a particular day. The performance and skills of all the health workers can be assessed in a simple manner and the best performer can be awarded or specially recognized which would also motivate other health workers to perform better. The only disadvantage is that in informed visit there is possibility of submitting false manipulated records whereas in surprise visit manipulation is impossible and hence original feedback obtained. To conclude supportive supervision by Vaishali model was

successful feasible approach to improve the child health in India.

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# Presence of Wormian Bones - A Medico-legal Perspective

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## ABSTRACT

Small additional ossicles, known as Wormian Bones are frequently found in the lambdoid suture, as also in many others in the adult human skulls. They are due to accessory centres of ossification occurring where the normal centres have failed to meet and form a normal suture<sup>1</sup>.

In this present work, 50 dry adult human dry skulls have been studied during the routine under graduate (MBBS 1st and BDS 1st Year) osteology demonstration classes to find out the sutural bones at and around the sutures. Wormian bones were observed at lambda, bregma, lambdoid suture, asterion and sagittal suture in 28 skulls (out of 50). The results were compared with the other studies to provide data to the radiologists, the clinicians (neurosurgeons) and the forensic experts (medicolegal purpose) for reference.

**Keywords:** Wormian Bones, Sutural Bones, Inca Bones (Interparietal Accessory Bone).

## INTRODUCTION

Wormian bones or Accessory bones occur within the cranial suture and fontanelles; most commonly in the posterior sutures. Sutural bones usually have little morphological significance, with notable exceptions. These are often only 02 or 03 but they appear in great numbers in hydrocephalic skulls. Their morphogenesis depends on partial or complete failure of fusion of the ossification centres<sup>2</sup>. The inca bones (interparietal accessory bones) form when the interparietal area either there is a failure of fusion of the existing centres or an additional ossification centre develops. Clinically, these may be related to host of conditions like defects in ossification, metabolic disorder and due to underlying pathology of central nervous system. Present study shows the incidence and position of wormian bones in South Indian population which is relevant for the neurosurgeons, the forensic experts and the radiologists.

## AIMS & OBJECTIVES

- To find out wormian bones or accessory bones at and around various sutures in the adult human skulls.

Work was under taken to throw more light for neurosurgeons, forensic experts and radiologists to know the possibilities of presence of various wormian bones or accessory bones in adult human skulls.

## MATERIALS AND METHOD

During the routine osteology demonstration classes (MBBS 1<sup>st</sup> and BDS 1<sup>st</sup> year), variations related to bregma, lambda, lambdoid suture, pterion, asterion and sagittal suture were noted in adult human skulls. Out of 50 dry skulls studied, 28 had wormian bones at various sites. The results were compared with the other studies to provide informations to the radiologists and the clinicians for reference.

**OBSERVATIONS**

In present study, wormian bones were observed at lambda, bregma, lambdoid suture, asterion and sagittal suture.

*In skull no. M1*, 03 large wormian bones were present around the lambda and 03 sutural bones were present at asterion (Fig no.01).

*In skull no. M2*, 02 interparietal bones around lambda, 06 sutural bones on the lambdoid suture and 05 at asterion were seen (Fig no.02).

*In skull no. F5*, a large interparietal bone at the lambda, 01 at the lambdoid suture and 02 at asterion were present (Fig no.03).

*In skull no. F9*, a large interparietal bone measuring about 7x 8cms and 03 other sutural bones around interparietal bone were seen (Fig no.04).

*In skull no. M16*, a sutural bone is present at the bregma (Fig no. 5).



Fig. 1. Skull M1 with 03 sutural bones around lambda



Fig. 2. Skull M2 with 08 sutural bones (02 interparietal bones and 06 sutural bones over lambdoid suture).

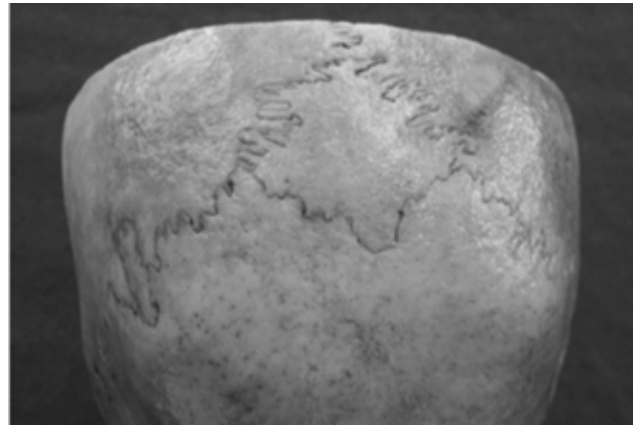


Fig. 3. Skull F5 with 01 interparietal bone

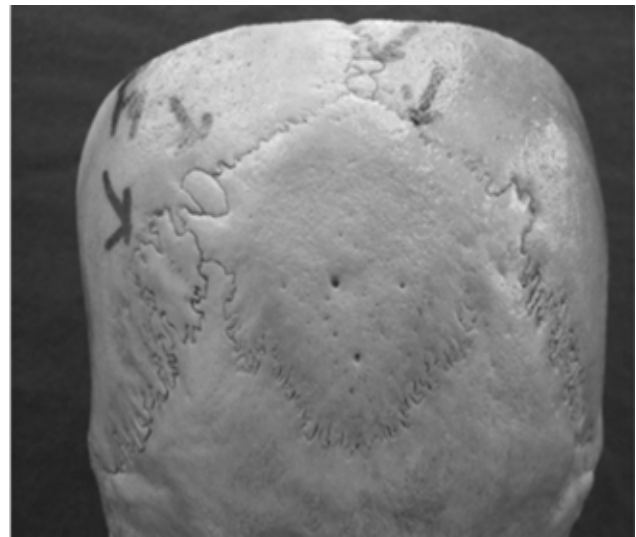


Fig. 4. Skull F9 with largest interparietal bone

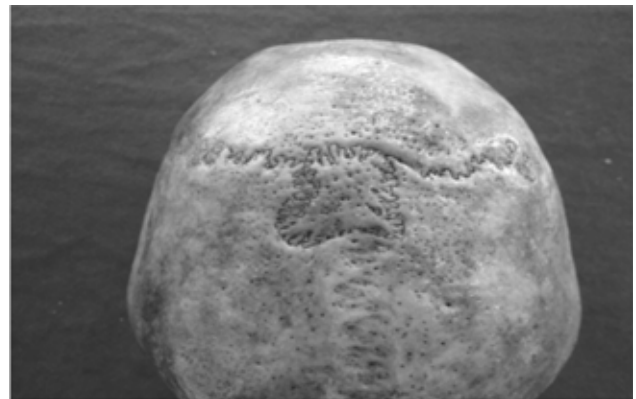


Fig. 5. Skull M 16, single wormian bone at bregma

**Table 1. Topographical distribution of wormian bones at various sites observed in the present study in 50 dry adult human skulls.**

Site of Wormian bone	Number	frequency
Lambda	20	24%
Bregma	01	2%
Asterion	13	26%
Sagittal suture	01	2%

## DISCUSSION

**Table 2. Comparison of the study by various authors and present study.**

Authors	Bregma	Lambda	Left pterion	Left asterion	Miscellaneous	Right pterion	Right asterion	Miscellaneous
Sumanudupi Case report <sup>3</sup>		01						
SatheeshaB Nayak Case report <sup>4</sup>			lambdoid suture		06 over		04 over lambdoid suture	
Hussainsaheb S Case report <sup>5</sup>	01							
Satheesha B Nayak 2006 Case report <sup>6</sup>	01 & presence of metopic suture							
Murlimanju& others <sup>7</sup> skulls			09	02 over lambdoid suture		02	18 over Lambdoid suture	
Present study 50 skulls	01	18	10	14 over Lambdoid suture		09	11 over Lambdoid suture	

The inca bones (interparietal accessory bones) form when the interparietal area either there is a failure of fusion of the existing centres or an additional ossification centre develops.

Dharwal kumud studied 150 dry macerated intact skulls and found 04 inca bones. The occurrence of these inca bones has been used as one of the nonmetrical epigenetic traits in racial differentiation<sup>8</sup>.

Marathe et al found the presence of inca bone in 05 out of 380 skulls from central India with an incidence of 1.31% of the cases. They also found sexual dimorphism for the presence of inca bones, the incidence being higher 1.428% in males compared to females 1.176%<sup>9</sup>.

In another study, a case report was found with bilateral wormian bones at the level of pterion which is a peculiar presentation. The presence of wormian bone at this site may lead to complication in making burr holes at the pterion for neurosurgeons<sup>10</sup>.

In the present study, our observations are in concurrence with some of the previous studies.

### CONCLUSION

The pathogenesis of wormian bones may be due to environmental variations in dural strain within open sutures and fontanelles. It is also attributed to mechanical stress causing cranial deformities. Recognition of these and possible variations will help in distinguishing from abnormal structures during CT and MRI, and in avoiding misinterpretations during

surgical interventions. These wormian bones, therefore have radiological, neurosurgical and medicolegal implications. In forensic Medicine, sutures simulating a fracture line and vice versa can tilt the balance from non grievous to grievous injuries.

### ACKNOWLEDGEMENT

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### SOURCE OF SUPPORT

50 dry adult human skulls for the study have been taken from the department (dissection hall and museum) kept for under graduate (MBBS 1<sup>st</sup> and BDS 1<sup>st</sup> year) osteology demonstration classes.

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# A Study on Awareness of 'Universal (Standard) Precautions' among Interns of J.J.M. Medical College, Davangere

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## ABSTRACT

**Objective of the study:** To assess the awareness of Universal Precautions among the Interns.

**Study design:** Questionnaire based cross-sectional study.

**Duration of study:** June 1st to 7th, 2009.

**Participants:** Interns of J.J.M. Medical College, Davangere, Karnataka.

**Statistical test applied:** Proportions.

**Materials & methods:** A pre-designed and pre-tested, multiple response type questionnaire was used to collect the data for the study.

**Results:** Total of 136 interns were available for the study. Meaning of universal precautions was known to majority (86.7%) of them. About 87.5% were aware that they are at risk of contracting blood-borne infections. Only 16% believed that it is unsafe to recap the needles after use. 61.7% preferred resuscitation bags over mouth to mouth breathing. About 75% of them perceived that it is essential to apply universal precautions on every patient irrespective of the disease or HIV status.

**Conclusion:** The awareness of universal precautions was not satisfactory among the study subjects. Therefore there is a great need to enhance their knowledge by orientation programmes at the beginning of internship.

**Keywords:** Awareness, Universal Precautions, Interns.

## INTRODUCTION

One of the serious problems of health care workers today, is the risk of occupational exposure to blood-borne pathogens such as HIV, HBV & HCV. WHO has estimated that about 4.4% of HIV cases, 37% of Hepatitis B and about 39% of Hepatitis C cases among health service providers worldwide are the result of occupational exposure<sup>1</sup>. More than 90% of these infections occur in developing countries<sup>2</sup>. Universal

Precautions are a “set of precautions designed to prevent transmission of HIV, HBV & other blood borne pathogens when providing first aid or health care”<sup>3</sup>. Compliance with ‘Universal Precautions’ has been shown to reduce the risk of exposure to blood and body fluids<sup>4</sup>. All health care workers should have a proper knowledge on ‘Universal Precautions’ for the safety of themselves & their patients.

Universal precautions are intended to prevent parenteral, mucous membrane, and non intact skin exposures of health-care workers to bloodborne pathogens. In addition, immunization with HBV vaccine is recommended as an important adjunct to universal precautions for health-care workers who have exposures to blood and body fluids<sup>5</sup>.

This study was taken up with the following objectives;

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- To assess the awareness of Universal Precautions among the Interns.
- To make necessary recommendations

### SUBJECTS & METHOD

A cross sectional survey was conducted among interns of J.J.M. Medical College, Davangere, Karnataka. Subjects were asked to complete a predesigned, pretested, multiple response type questionnaire which was used to collect the data. A total of 136 interns gave consent and all of them were enrolled for the study. They were assured about maintenance of their confidentiality.

The questionnaire contained multiple choice questions. Each question had a response as “don't know” also which was considered as incorrect. The study variables included the awareness about meaning of Universal Precautions, type of body fluids on which Universal Precautions to be & not to be applied, who are the at risk groups, whether interns are at risk, how to deal with sharps, self protection measures and handling of laboratory specimens.

### OBSERVATIONS

A total of 136 interns were included in the study. Among them 13% had never heard the term 'Universal precautions'. About 8% considered themselves to be out of risk of bloodborne infections. About 91.9% considered doctors, nurses & laboratory workers to be the 'at risk' group, while 4.4% believed only doctors to be at risk and 3.7% believed none of them are at risk.

**Table 1. Awareness regarding meaning and application of Universal Precautions**

	Yes		No	
	Number	%	Number	%
Universal Precautions means, self protection against all infections transmitted by blood & body fluids	118	86.76	18	13.23
Universal Precautions are applied for all internal body fluids	113	83.08	23	16.91
Universal Precautions are NOT applied for all external body fluids	45	33.08	91	66.91

Table 1 shows that, about 86.7% (118) of the interns were aware about the correct meaning of Universal Precautions. Regarding application, majority of them (83%) knew that Universal Precautions have to be applied for all internal body fluids. But very few (33%) were aware that Universal Precautions need not be applied for all external body fluids.

**Table 2. Awareness regarding self protection measures**

	Correct answer	Number	%
Procedures with splashing of blood	Using gowns, face masks, goggles etc.	128	94.11
Accidental contact with blood & body fluids	Wash with soap & water	67	49.26
Resuscitation in emergency	Using resuscitation bags	84	61.76
Type of pipette	One with rubber bulb	107	78.67

Regarding their awareness about self protection measures, many (94.1%) were aware about usage of gowns, masks goggles etc. but very few (49%) knew what to do in case of accidental contact with body fluids. About 61.7% preferred resuscitation bags over mouth to mouth breathing during emergencies and about 78.6% opted for pipettes with rubber bulbs for handling body fluids.

**Table 3. Awareness regarding practice of Universal Precautions**

Practices	Correct answer	Number	%
Using gloves to handle lab specimens	Yes	126	92.64
Apply Universal Precautions on every patient irrespective of disease	Yes	104	76.47
Apply Universal Precautions on HIV-ve patients	Yes	100	73.52
Disposal of sharp items in Puncture proof containers	Yes	117	86.02
Recapping of needles Never be done	Yes	23	16.91

Table 3 shows the awareness regarding practice of Universal Precautions. About 92.6% preferred to use gloves while handling laboratory specimens, 76% said Universal Precautions should be applied on each & every patient irrespective of the disease status, about 73.5% knew that Universal Precautions should be applied on HIV -ve patients also. Regarding disposal of sharps, about 86% were aware that they should be disposed in puncture proof containers but very few (16.9%) among them knew that recapping of needles after usage should never be done.

### DISCUSSION

The awareness about universal precautions among the study subjects was good in some aspects but not satisfactory in many others. The awareness about self protection measures was better in our study subjects which is in accordance with the results of a study by Kotwal A. et al<sup>6</sup>.



Despite the availability of detailed guidelines, the knowledge and understanding of Universal Precautions among HCWs even in developed countries has been found to be inadequate<sup>7</sup>. In developing countries, including India, the situation is worse and occupational safety of HCWs remains a neglected issue<sup>8</sup>.

This low level of awareness may be due to the fact that the concept had not been stressed upon in classroom & clinical teaching. Medical students should be made aware of Universal Precautions as early as possible as these young doctors are at increased risk of occupational exposure to deadly infections because of their low awareness & a desire to do practical procedures. So, there is a great need to enhance their knowledge about self protection by orientation programmes at the beginning of internship.

The topic should be included in recommended text books of under graduate teaching & taught with the help of audio-visual aids. A multifaceted approach should be adopted including initial & periodic training for the young doctors. Each and every institution should develop appropriate infection control & injury surveillance committees.

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# A Study on Risk Factors of Type-2 Diabetes Mellitus - A Case Control Study

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## ABSTRACT

**Background:** According to WHO estimates, India will be the global capital of Diabetes by 2030, accounting for about 79.4 million diabetics<sup>1</sup>. Type 2 DM is one of the most common health problems in India. It is caused by the interaction of multiple risk factors, which may be constitutional, behavioral or environmental factors. Identification of these risk factors is important in order to prevent or postpone the development of the disease.

**Objectives:** To identify the risk factors of type 2 DM and to study the association of risk factors and the strength of the association with the occurrence of type 2 DM.

**Methods:** Cross-sectional, hospital based case-control study conducted at Chigateri General Hospital and Bapuji Hospital, both teaching hospitals of J.J.M. Medical College, Davangere, Karnataka. Study was carried out from November 2010 to October 2011.

**Results:** This study comprises of 406 cases and 406 controls. Positive family history (OR-1.6), alcohol intake (OR-1.5), decreased physical activity (OR-2.8), lack of exercise (OR-1.7) and obesity (OR-2.5) were identified as independent risk factors for type 2 DM. By multivariate analysis all the above factors were found to be significant with p values 0.02, 0.07, 0.00, 0.00 and 0.00 respectively.

**Conclusion:** Type 2 DM can be prevented or postponed by early detection of risk factors and modifications in life style and behavioral patterns.

**Keywords:** Type 2 Diabetes Mellitus; Risk Factors; Case-Control Study.

## INTRODUCTION

Diabetes mellitus is a universal health problem affecting human societies at all stages of development. An estimated 171 million people were affected by diabetes in 2000, two thirds of which live in developing countries<sup>2</sup>. The number of cases reported is increasing rapidly with the aging of populations, changes in life style and improvement in ascertainment. Although a more prominent health problem in developed countries, it is erroneous to consider diabetes a disease of affluent societies.

DM is gaining momentum in India. Studies have shown the prevalence of DM to be 2.4% in rural and 4 to 11 % among urban dwellers<sup>3</sup>. There were around 31.7 million diabetics in India in 2000, thus having largest number of diabetics in the world and the projected figure for the year 2030 is 79.4 million<sup>1</sup>. In addition to

the strong genetic predisposition of DM, studies have also revealed the influence of the interaction of host factors and environmental factors<sup>4</sup>. Identification of these locally relevant and avoidable risk factors will help in primordial prevention of DM.

Since studies conducted in India to identify the risk factors of type 2 DM are very few and from Karnataka the reports are scanty and nil from Davangere, the present hospital based case control study was undertaken to identify the risk factors of type 2 DM in this region with the following objectives;

- To identify the risk factors of type 2 diabetes mellitus
- To study the association of risk factors (host factors, socio-economic factors and environmental factors) with the occurrence of the disease.
- To find out the strength of the association between

the risk factors and type 2 diabetes mellitus.

## SUBJECTS & METHOD

The study was carried out over a period of one year from November 2010 to October 2011 in Bapuji & CG Hospitals, both attached to J.J.M. Medical College, Davangere, Karnataka.

### STUDY SUBJECTS

The study population concluded to be 406 cases of type 2 DM using the formula,

$$n = \frac{Z^2pq}{e^2}, \text{ where } n = \text{sample size} \\ Z=1.96$$

p=prevalence rate of type2DM from previous studies=4%=0.04

$$q = (100-p) = (100-4) = 96\% = 0.96$$

e=allowable error =2 % (0.02) of the true value

All were fresh cases, above 15 yrs of age, inclusive of both the genders, confirmed by the physicians by Oral Glucose Tolerance Test and admitted in the medical wards of both the hospitals, taken as "cases" and an equal number of age- sex matched non-diabetics taken from in-patients of the same hospitals, from all the wards, other than medical wards, admitted on the same day, as "controls". Thus 406 cases and 406 controls (total=812) were included in the study. Type1DM, diabetics below 15yrs, diabetics under treatment & gestational diabetics were excluded from the study.

The criteria for diagnosis of type 2 DM is the blood glucose level remaining above 180mg/dl of venous blood, after 2 hrs of glucose load.

After obtaining permission from unit heads and superintendents of both the hospitals, subjects were studied individually with their informed consent, assuring the maintenance of confidentiality.

### METHODOLOGY

A predesigned, pretested, semi structured interview schedule was used. From all the study subjects self reported data regarding age, sex, domicile, literacy level,

occupation, monthly income, family h/o type 2DM, diet, alcoholism, life style and exercise was obtained. Among female subjects information about intake of oral pills was collected. This was followed by anthropometric measurements like weight and height.

Weight was recorded without footwear with minimum cloths, by using bathroom scale, checking everyday against a known weight and recorded to the nearest 100gms.

Standing height was measured without footwear by using UNICEF's non stretchable but flexible, made of fibre tape and recorded to the nearest 0.5cm.

### CRITERIA

Age was recorded in completed years as revealed by the subjects. Socio-economic status was classified using Modified B. G. Prasad's classification by recording self reported per capita monthly income.

Subject's literacy level was classified as: Illiterate, School & College. Occupation of individual subjects was classified as Professional, Managerial, Clerical, Skilled, Unskilled & Unemployed.

History of type 2 DM among first degree relatives of the subjects was taken and classified as: Absent, One parent & both parents. Type of diet was recorded as vegetarian or non-vegetarian. H/o alcohol intake was recorded as: Absent, Occasionally & frequently.

Life style of the subjects was classified into Sedentary, Moderate & Heavy work depending upon their occupation. Exercise was recorded as No, Moderate or Heavy.

Depending on BMI, degree of obesity was recorded as, <18.5 – underweight, 18.5-24.9— normal, 25-29.9 – pre-obese, >30-obese. Among female subjects h/o use of OCPs was asked & recorded as, absent or present.

### ANALYSIS

The data was tabulated & analyzed with the help of SPSS17.0 software package.

The statistical tests applied are: Proportion, Chi-square test ( $\chi^2$ ), Odds ratio (OR) and Multiple logistic regression analysis.

## RESULTS

Table 1. Sociodemographic profile of cases &amp; controls

Characteristics	Cases n=406(%)	Controls n=406(%)	p value
15-25	0	0	$\chi^2 = 0.087$ df=2 p=0.957
26-35	11(2.7)	10(2.5)	
36-45	80(19.7)	78(19.2)	
>45	315(77.6)	318(78.3)	
Sex			$\chi^2 = 0.006$ df= 1 p = 0.938
Male	289(71.2)	290(71.4)	
Female	117(28.8)	116(28.6)	
Domicile			$\chi^2 = 0.048$ df= 1 p = 0.827
Rural	259 (63.80)	256(63.10)	
Urban	147(36.20)	150(36.90)	
Literacy level			$\chi^2 = 3.808$ df= 2 p = 0.149
Illiterate	76(18.70)	74(18.20)	
School	165(40.60)	191(47)	
College	165(40.60)	141(34.70)	
Occupation			$\chi^2 = 8.221$ df=5 p = 0.144
Professional	32 (7.90)	32 (7.90)	
Managerial	29 (7.10)	21 (5.20)	
Clerical	61 (15)	57 (14)	
Skilled	81 (20)	79 (19.50)	
Unskilled	70 (17.20)	101 (24.90)	
Unemployed	133 (32.80)	116 (28.60)	
SES			$\chi^2 = 1.824$ df=4 p = 0.768
class I	43(10.60)	55(13.50)	
class II	66(16.30)	65(16)	
class III	112(27.60)	112(27.60)	
class IV	120(29.60)	112(27.60)	
class V	65(16)	62(15.30)	

Majority of cases belonged to >45yrs age group (77.6%). Males constituted 71% among cases. Most of cases were rural inhabitants (63.8%). About 18.7% were illiterates. Although there was no significant association between occupation of cases & controls,

majority of cases were unemployed(32.8%) as compared to controls(28.6%). About 46% of cases belonged to lower (class IV& class V) SES. However there was no significant association between SES & diabetes (Table 1).

Table 2. Distribution of risk factors among cases &amp; controls

Risk factors	Cases n=406(%)	Controls n=406(%)	p value
Family history			$\chi^2 = 6.032$ df= 2 p = 0.049
Absent	323 (79.60)	349 (86)	
One parent	69 (17)	49 (12.10)	
Both parents	14 (3.40)	8 (2)	
Diet			$\chi^2 = 0.057$ df= 1 p = 0.811
Vegetarian	297 (73.20)	300 (73.90)	
Non-vegetarian	109 (26.80)	106 (26.10)	
Alcoholism			$\chi^2 = 6.51$ df= 2 p = 0.04
Absent	302 (74.40)	330(81.3)	
Occasionally	83 (20.40)	56(13.8)	
Regularly	21 (5.20)	20 (4.9)	
Physical activity			$\chi^2 = 60.649$ df= 2 p =< 0.001
Sedentary	322 (79.30)	234 (57.6)	
Moderate	80 (19.70)	124 (30.5)	
Heavy worker	4 (1)	48 (11.8)	
Exercise			$\chi^2 = 24.9$ df= 2 p = 0.00
No	323 (79.60)	282 (69.5)	
Moderate	82 (20.20)	101 (24.9)	
Heavy	1 (0.20)	23 (5.7)	
Degree of obesity			$\chi^2 = 35.1$ df= 3 p = <0.001
<18.5	33(8.1)	44 (10.8)	
18.5-24.9	253 (62.3)	304 (74.9)	
25-29	95 (23.40)	34 (8.4)	
>30	25 (6.2)	24 (5.9)	

By statistical analysis, positive family history (OR 1.6), alcohol intake (OR 1.5), sedentary lifestyle (OR 2.8), lack of physical exercise (OR 2.8) & obesity (OR 2.5) were significantly associated with diabetes (Table 2). However type of diet & OCP use among women were not found to be significantly associated with diabetes (Table 3).

**Table 3. Oral contraceptive pills use among female subjects:**

H/o use of Oral Pills	Cases n=117(%)	Controls n=116(%)	Total	Chi-Square Value
Absent	110 (94.01)	111 (95.68)	221 (94.84)	$\chi^2 = 0.33$
Present	7 (5.98)	5 (4.31)	12 (5.15)	df = 1
Total	117 (100)	116 (100)	233 (100)	p = 0.56

By using multiple logistic regression analysis, the factors which were found to be significant with p value <0.05 are; family history of type 2 DM (p=0.02), decreased physical activity (p=0.00), absence of exercise (p=0.00), and obesity (p=0.00). Alcohol intake was found to be moderately significant (p=0.07) (Table 4).

## DISCUSSION

Type 2 DM more common among persons of >45yrs of age as seen in our study is supported by Ramaiah KL et al<sup>5</sup>. However there is a literature to support the occurrence of type 2 DM among younger age groups including children, adolescents and young adults<sup>6</sup>.

More number of males affected by DM as seen in our study is supported by Wild S et al<sup>7</sup>. But to draw the conclusion in this matter is difficult because of contradictory results by Ramachandran A et al<sup>8</sup>. However there was no significant association between sex and risk of type 2 DM.

Majority of cases in our study were from rural areas. This may be due to the fact that Davangere is surrounded by many villages and the hospitals of our study are the main specialty centers for these villages. However there are contradictory observations regarding the prevalence of DM and the domicile<sup>9</sup>.

Level of education not showing any significant association in this study is contradictory to the results of study by Maty SC et al<sup>10</sup> which report low level of education as a risk factor of type 2 DM.

DM more common among unemployed persons as seen here may be because of lack of physical activity among them leading to development of disease. However there was no significant association between type of occupation and risk of type 2 DM, which is contradictory to the results of Pan CY et al<sup>11</sup>.

More prevalence of DM among persons of lower socio economic class may be due to life style changes, lack of

awareness about preventive measures and inaccessibility of these people to health care services. The result of our study is supported by the results of Banerjee et al<sup>12</sup>. This is again contradictory to the information available in literature<sup>13</sup>.

In our study significant association between family history and type 2DM was found, which is supported by Krentz AJ et al<sup>14</sup>. Thus family history can be considered as an important non-modifiable risk factor for type 2DM.

In our study DM was more common among vegetarians than non-vegetarians. This is in contrast with the results of several studies, which report that high fat intake, non-vegetarian diet and diet low in fibers to be the risk factors for development of type 2DM<sup>15</sup>.

Positive association between alcohol intake and risk of type 2DM as seen in our study is supported by Carlsson S et al<sup>16</sup>. Whereas Perry JJ et al<sup>17</sup> has shown an inverse association. Thus the effect of alcohol on DM can be considered ambiguous.

Lack of physical activity showing a significant association with risk of type 2DM as seen in our study is supported by Lindstrom J et al<sup>18</sup>. Thus decreased physical activity can be considered as independent risk factor for the development of type 2DM.

Lack of exercise was a significant risk factor of type 2DM in our study. This is supported by Manson JE et al<sup>19</sup> which has clearly reported the beneficial effects of exercise in reducing the risk of developing type 2DM.

There was a significant association between degree of obesity and type 2DM in our study. Similar findings have been quoted in the literature<sup>20</sup>.

There was no significant association between intake of oral contraceptive pills by female subjects and risk of type 2 DM in our study, which is supported by Rimm EB et al<sup>21</sup>.

In order to find out the effect of interaction between multiple variables on development of type 2 DM, multiple logistic regression analysis was done. The independent variables included were both qualitative and quantitative such as age, sex, domicile, literacy level, occupation, SES, family history, diet, alcohol intake, physical activity, exercise and degree of obesity.

OCP intake was not included in logistic regression analysis as the data was elicited only among female subjects and very few females gave history of OCP intake.

In this study 12 independent variables have been included in the model. With p value <0.05 as significant,

positive family history ( $p=0.02$ ), lack of physical activity ( $p=0.00$ ), absence of exercise ( $p=0.00$ ) and obesity ( $p=0.00$ ) have shown significant association with type 2 DM. Alcohol intake has shown moderate association with  $p=0.07$ .

All the variables, which had shown association in univariate analysis, were found to be significant by multivariate analysis. Although these variables can be considered as independent risk factors, the interactive effect of these factors is also an important risk factor for the development of DM.

### LIMITATIONS

It is a hospital based study and the relation between type 2 DM and duration of obesity is not studied in detail.

**Conclusion;** the present study identifies;

Family history of type 2 DM, alcohol intake, lack of physical activity, absence of exercise and obesity as the independent risk factors for type 2 DM by univariate analysis. By multivariate analysis, interaction of all the above factors was found to be an important cause for development of type 2 DM.

Thus it can be concluded that, although family history is a non-modifiable risk factor, the disease can be prevented by abstinence from alcohol, increasing physical activity, inculcating the habit of regular exercise and maintaining normal body mass index.

Since the observations regarding the relation between the domicile, occupational status, socio economic status and DM are contradictory to the available literatures, it needs further detailed study.

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# NRHM - The Panacea for Rural Health in India: A Critique

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## ABSTRACT

After six years of implementation NRHM has failed to achieve its stated objectives. A scrutiny of this failure is overdue. This paper analyzes fundamental conceptual inherent to the Mission to draw lessons for future most important of which is that the 'health of the people is not a standalone phenomenon that can be improved through healthcare alone. It requires a comprehensive action plan encompassing food security, employment and poverty alleviation as well.

**Keywords:** NRHM, Mission, ASHA, NGO, health

## INTRODUCTION

There is a reasonably clear idea by now of what NRHM is likely to achieve in the final assessment.

Reproductive and Child Health (RCH) has been a clear focus of the NRHM. The table below presents progress in some key parameters of RCH II as per the 6<sup>th</sup> Joint Review Mission of NRHM.<sup>1</sup>

RCH II Goal Indicator	All India Figure (source of data)			RCH II NRHM Goal (2012)
Maternal Mortality Ratio (MMR)	398(SRS 1997-98)	301(SRS 2001-03)	254(SRS 2004-06)	< 100
Infant Mortality Rate (IMR)	71 (SRS 1997)	60 (SRS 2003)	55 (SRS 2007)	< 30
Total Fertility Rate (TFR)	3.3 (SRS 1997)	3.0 (SRS 2003)	2.7 (SRS 2007)	2.1

Source: NRHM 6<sup>th</sup> Joint Review Mission.

Enhancing institutional deliveries by implementing 'Janani Suraksha Yojna' (safe birth scheme) was the key strategy to reduce maternal and the infant mortality. Institutional deliveries were expected to directly reduce maternal mortality, while also helping to reduce the crucial neonatal mortality and thereby the infant mortality rate. The expectations remain illusionary. Continuing shortfall in the facilities ensures that the targets are least likely to be achieved by 2012. For example only 44 % of the 8473 24 X 7 PHCs provide the three essential services of managing normal deliveries, some common obstetric complications and essential new born care, while only 39 % of the FRUs provide full complement of obstetric services.<sup>1</sup>

Above that, different states continue to struggle with acute shortage of trained manpower for rural health

services.<sup>1</sup> The EAG (Empowered Action Group) States, for whom NRHM was initially scheduled, remain far behind other states in important parameters.<sup>2</sup> Question thus arises - was NRHM an appropriate package to rejuvenate rural health care?

## Fundamental Flaws In The Conceptualization Of The Mission

At its inception itself, numerous critiques of the Mission had seriously questioned the basis of the various strategies of the Mission.<sup>3, 4, 5, 6, 7</sup> Profound lack of an epidemiological approach was at the core of these critiques. Neither the NRHM mission document nor the NRHM Framework for Implementation 2005-2012 provide an analysis of the problems of rural health care in India; Neither is there a discussion on past experiences, nor is there any clue to the evidence base for the various strategies enumerated in the mission documents.

Different National Family Health Surveys (NFHS) and the National Sample Survey Organization (NSSO) surveys have highlighted wide variations in health

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outcomes by caste, expenditure categories and gender. Barring passing reference to gender, there is little appreciation of stratification of the rural society by caste or class; let alone the strategies to ensure the accessibility of the most marginalized segments to these services. Oversight of the specific needs of the marginalized sections undermines effective implementation of NRHM.

The Mission seeks to provide – “Universal access to public services for food and nutrition, sanitation and hygiene and universal access to public health care services with emphasis on services addressing women’s and children’s health and universal immunization”.<sup>8</sup> However, the core and the supplementary strategies of the Mission concern primarily with the health service provision and their financial management. There is neither a mention of the strategies to ensure food security and nutrition of the people, nor any targets to measure their progress. NRHM does talk of total sanitation mission, but is casual on measuring its progress.

NRHM recognizes that poverty is the biggest barrier to access health services and equity in health. Lack of regular employment is an important cause for poverty and together they undermine people’s food security and thereby their health. Good health is essential to mitigate the effects of socio-economic inequities. Absence of effective strategies to tackle issues like unemployment, poverty and food security, leaves it to purely technological medical interventions to achieve the desired outcomes of NRHM. This strategy is intrinsically self defeating.

“Communitization”, “Community Ownership”, “Community Participation” and “Accountability to the Community” – these themes are often raised in the NRHM documents. NRHM has been blissfully ignorant of the needs of the marginalized sections of the rural society. This begets the question – can the marginalized and those with little voice in the society command accountability unless actively supported by the system?

Patterns of disease are socially produced and those at the lower rungs of the society suffer more from ill-health. Hence, an attempt to improve the health of the masses has to be imbued with a vision for ‘social justice’, backed by efforts to change the unjust socioeconomic realities.<sup>9,10,11</sup> Nobody expected NRHM to bring about a radical redistribution of resources in the society, but implementation of comprehensive rural employment guarantee programs and food security for the people by restructuring PDS (Public Distribution System) to reduce their dependence on the propertied classes for their existential needs was certainly possible. For example the United Progressive Alliance (UPA) - I

government could unroll NRHM, the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and Food Security Bill together, with the objective of making them complement each other. This could have delivered some empowerment of sections like the landless agricultural laborers, the scheduled castes, scheduled tribes and the women, thereby enabling them to seek accountability and exercise control over the health services.

However, this requires a political vision and political will. Experience of the implementation of NREGA and NRHM and now the debate around the Food Security Bill, betray a lack of such political will on part of the government. Add to this the impact of the widespread agrarian distress due to the economic policies that have spelt the ruination of small, marginal and even middle peasants, thereby further aggravating social inequalities.

In the absence of concerns for social equity, economic growth and public health interventions could easily end up aggravating, not ameliorating, social inequalities in health if such economic growth increases economic inequality.<sup>12</sup> Should it be surprising, if by ignoring social equity in the context of the neoliberal development paradigm, NRHM ends up fortifying social and health inequalities?

### **Inherent Contradictions In The Mission’s Implementation Strategies**

Public private partnerships (PPPs) in health sector are another sine qua non of NRHM. They have become a convenient alibi to outsource a variety of services and personnel ranging from class four staff to even doctors. Outsourcing of services under different names like ‘Janani’ in Bihar and ‘Yeshaswani’ Trust in Karnataka, have become a byword for innovation.

However, the Mission is clueless about resolving the essentially antagonistic motives of the private sector to provide care for profit and that of the public sector to provide healthcare irrespective of the people’s capacity to pay. The suggested middle path is that of engaging the not for profit civil society organizations as partners for achieving public health goals. The report of the task force on PPPs says – “A very innovative experimentation is currently under progress in Arunachal Pradesh with the help of NGOs like the Voluntary Health Association of India and Karuna Trust. Such a window for partnerships with NGOs for service delivery, in remote regions or at public facilities where for some reason the Government delivery structure is not able to provide those service guarantees, would be an useful way to reach out services where they are needed”.<sup>14</sup>



It would have been fruitful if the report had elaborated on the 'reasons' for which the government, inspite of its immense administrative, financial and logistical capabilities fails to provide 'service guarantees' in remote areas and the factors that enable the NGOs, to deliver these services, such that appropriate lessons can be drawn to remedy government action. In the long run it is desirable that health care in such difficult areas be provided by the government rather than being left to the nebulous capabilities of NGOs. After all if the government serves healthcare for the armed forces in the remotest areas, why should that not be possible for civilians?

215 mother NGOs have been identified under the Mission to assist in the implementation of disease control programs, RCH – II, routine immunization, pulse polio and Janani Suraksha Yojna etc. in some 300 districts.<sup>8</sup> The 'framework of implementation' for NRHM states – "Besides advocacy, NGOs would be involved in building capacity at all levels, monitoring and evaluation of the health sector, delivery of health services, developing innovative approaches to health care delivery for marginalized sections or in underserved areas and aspects, working together with community organizations and Panchayati Raj institutions, and contributing to monitoring the right to health care and service guarantees from the public health institutions. The effort will be to support / facilitate action by NGO networks in the country which would contribute to the sustainability of innovations and people's participation in the NRHM".<sup>8</sup>

NRHM thus prescribes large scale "NGO-ization" of government in the delivery of health services. This has important consequences. There is no mention of any country experiences where sustainable improvement in the health of the people has been possible through large scale outsourcing of government functions to NGOs. Rather this but a way of introducing intermediaries between the government and the people in the delivery of health services; thereby absolving the government of any direct answerability to the people. NGOs on the other hand, are answerable only to their funding agencies on whom they depend for their sustenance, while answerability to the people remains optional. The notion of 'selfless service' that is cultivated around NGOs, gives an impression that people should be grateful for their 'selflessness' rather than be assertive in seeking accountability / services.

The control of the funding agencies over the NGOs has potentially dangerous implications for the country. It is entirely possible that a large NGO involved in the implementation of a vital health program, which is funded by USAID or DFID would be more answerable to the embassies of US or Britain than to Health Ministry in New Delhi. Involvement of PATH; an International

NGO, in the controversial human papilloma vaccine trials in India, is a case in the point.<sup>15</sup>

While provision of services through NGOs is encouraged on one hand, on the other NRHM visualizes an important role for them in 'community monitoring'<sup>16</sup> i.e. that NGOs will sit in judgment over their own trial. This is vulgarization of the concept of community monitoring which essentially is a political process facilitated by socio-economic empowerment of the people rather than being an NGO processed reform.

### **Some Observations On The Asha Scheme**

ASHAs (accredited social health activist) are the fulcrum of on which the entire balance NRHM rests. There is a fundamental flaw in the conceptualization of an 'activist'. An activist is a person who is a vigorous advocate of a cause and whose primary motivation is the realization of the cause without regard to any other incentive. We need to understand the conditions under which a person would be willing to be such an activist.

People have many needs. The life of the poor in rural areas revolves primarily around the struggle for their daily bread, dictated by the objective conditions of their life. Once this most fundamental want is satisfied, their attention goes to satisfying other basic needs like clothing, housing or the education of the children. Even under the best of circumstances, it is nothing short of extraordinary that a poor rural household manages to fulfill these needs. Under such conditions people can be motivated for an activist role only under two situations – one, if people become politically organized and motivated by higher ideals to change the societal conditions or if the government implements such programs which initiate an all round development in the lives of the people giving them this conviction that they must ensure the success of these policies for fulfillment of their basic needs. In both these conditions the struggle for the basic existential needs and the struggle for overall social development become one.

In other words unless a program also addresses the basic existential needs (bread, butter and employment) of the people, it cannot invoke any spirit of activism in them. The NRHM planners on their part seem to have been aware of this; that is why they embedded monetary incentives into the ASHA scheme itself; and ASHAs have performed best where the incentives lie i.e. in shoring up the rates of institutional deliveries under the Janani Suraksha Yojna. This is a far cry from what was envisaged of her.

### **Important Lessons From The Mission**

NRHM had come into being at a very important historical juncture – a time when the country had already witnessed nearly two decades of economic

reforms and structural adjustment policies. Despite the unprecedented high economic growth rates that the country has witnessed, there has been stagnation in the human development indicators of the country. Worldwide there is an increasing resistance to globalization. Some of the earlier votaries of globalization – former chief World Bank economist Joseph Stiglitz and Amartya Sen presented their own critiques of globalization which urged for globalization with a human face. In the midst of all this the splendid ‘Shining India’ campaign of the BJP led NDA government failed to return it to power. The writing on the wall was thus clear for the ruling classes. It was under such conjuncture of circumstances that the new coalition at the Centre; the UPA I came up with social welfare programs like the NRHM, NREGA and the farm loan waiver.

Even though necessitated by compelling circumstances, these programs were not borne out of any kind of self realization on part of the ruling elite; they were more in the nature of mollifying the people. Resultantly, NRHM was a very poorly conceived program. As we have noticed above, there continue to remain vital gaps in NRHM that have ensured the non-achievability of the Mission’s objectives. Concepts of ‘decentralized planning’, devolution of powers, ‘community control and monitoring’ and inter-sectoral coordination remain notional rather than substantive.

The most appropriate lesson to draw would be that health of the people is not a standalone phenomenon that can be improved by making arrangements for provision of healthcare alone. Improving the health of the people involves a comprehensive action plan that encompasses areas like food security, employment and poverty alleviation as well. Healthcare is a continuing process; it may be too late to redeem the present version of NRHM. All we can hope is that the lessons drawn here from shall feed into the future planning for health and that the policy planners shall be wiser by their mistakes.

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# An Extremely Rare Presentation of Mesenteric Cyst

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## ABSTRACT

A mesenteric cyst is defined as any cyst that is located in the mesentery and may or may not extend into the retro-peritoneum. It has been reported that the mesenteric cysts have an incidence of 1/100000 hospital admissions in adults and 1/20000 in children.<sup>1,2</sup> Mesenteric cysts are very rare intra-abdominal lesions. They are usually diagnosed as an incidental laparotomy finding in adults, but in childhood they may present with acute abdomen. Mesenteric cyst presenting as inguinal hernia is extremely rare. Only five cases have been reported in the literature. The present case is the sixth, and the third from this subcontinent. As per the best of our knowledge and available English literature this is first case in adults. All previously mentioned cases are in children. The goal of surgery is complete excision.

**Keywords:** Mesenteric Cyst, Inguinal Hernia, Laparotomy, Surgical Excision.

## INTRODUCTION

Mesenteric cysts were first reported in an autopsy by an Italian Anatomist, Benevieni in 1507. The first successful resection of a mesenteric cyst was performed by Tillaux in 1880 and successful marsupialization of a mesenteric cyst was reported by Pean in 1883.<sup>2,3</sup> Mesenteric cysts are rare intra-abdominal pathologies without typical clinical findings. It has been reported that the mesenteric cysts have an incidence of 1/100000 hospital admissions in adults and 1/20000 in children.<sup>1,2</sup> They are usually incidentally found at laparotomy. The symptoms of this pathology vary from acute abdominal signs to non-specific abdominal findings. Mesenteric cysts can be located anywhere in the mesentery from the duodenum to the rectum.<sup>1,2</sup> The pathogenesis is not uniform. The clinical and radiological diagnosis is difficult. The treatment of choice is surgical resection. The complications which have been induced by a mesenteric cyst are rare. To our knowledge, only five cases, which have been located in

an inguinal hernia, and all were in children.<sup>4</sup> Here we are presenting an extremely rare case of inguinal hernia including a mesenteric cyst in adult.

## CASE REPORT

A 45 year old man presented with swelling in left inguinoscrotal region since 2years, not reducible since 8 months. He had no symptoms of obstruction. His past and family histories were not significant. On examination his general condition was fair, with pulse rate of 78 per minute and blood pressure of 130/70mm of Hg. On abdominal examination mass felt measuring 15x12cms in suprapubic region extending upto umbilicus, being smooth, round, non-tender with restricted mobility in a transverse plane than in a cephalo-caudal plane. On inguino-scrotal examination a non-reducible inguino-scrotal swelling of size 12x 8cms noted, with fluctuation being positive between this and abdominal mass. His blood and urine investigations were within normal limits. CT abdomen showed large well defined abdomino-pelvic cystic mass measuring 17x14.5cms herniating through left inguinal canal into scrotal sac most likely suggestive of peritoneal cyst. With diagnosis of peritoneal cyst going for inguinal hernia laparotomy was performed under general anesthesia. Operative findings include 14 x 11cms mesenteric cystic arising from transverse mesocolon,

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herniating into left inguinal canal. Second incision at left inguinal region taken, adhesions released and slowly hernia reduced into peritoneal cavity. The cyst carefully enucleated. Hernioplasty was done. Histopathological findings were consistent with mesenteric cyst. Postoperative period was uneventful.

## DISCUSSION

Mesenteric cysts are extremely rare intra-abdominal pathologies. They present as an abdominal mass in more than 50% of cases and are incidentally discovered in 40% of cases.<sup>1,2</sup> With the advances in the imaging techniques, they can be diagnosed even when they are asymptomatic. Most cases are usually asymptomatic unless complicated. Symptoms due to mesenteric cysts are related to size and localization of the lesion.<sup>5</sup> They may be incidentally detected by a routine examination. They may cause nonspecific symptoms such as abdominal pain, nausea, vomiting, weakness, weight loss, diarrhoea, constipation, cramp and anorexia rarely.<sup>1,3,6</sup> They usually become symptomatic when complications such as torsion, hemorrhage, infection, rupture, malignancy occur.<sup>5,7</sup> Also the compression on bowel and urethra may lead to various clinical obstructive findings.<sup>2</sup>

Mesenteric cysts with more than 5cm in diameter are usually symptomatic. Malignant transformation is rather rare and only four cases with malignant transformation have been reported in the literature.<sup>2,5</sup> Mesenteric cysts can occur anywhere in the mesentery of the gastrointestinal tract from the duodenum to the rectum, and they may extend from the base of the mesentery into the retroperitoneum.<sup>8,9</sup> In a series of 162 patients, 60% of mesenteric cysts occurred in the small-bowel mesentery, 24% in the large-bowel mesentery, and 14.5% in the retro-peritoneum. They most commonly occur in the ileal mesentery of the small bowel or the sigmoid mesentery of the colon.<sup>3</sup>

As proposed by Gross, mesenteric cysts are thought to represent benign proliferations of ectopic lymphatics that lack communication with the normal lymphatic system.<sup>10,17,18</sup> Cysts are thought to arise from lymphatic spaces associated with the embryonic retroperitoneal lymph sac, making them analogous to cystic hygromas, which arise in the neck in association with the jugular lymph sac.<sup>19</sup> Another proposed etiology is lymphatic obstruction.<sup>20</sup> However, experimental occlusion of lymphatic channels in animals does not produce

mesenteric or omental cysts because of the rich collaterals in the lymphatic system, which sheds doubt on this particular theory.<sup>8,17,19</sup> Other etiologic theories include (i) failure of the embryonic lymph channels to join the venous system, (ii) failure of the leaves of the mesentery to fuse, (iii) trauma, (iv) neoplasia, and (v) degeneration of lymph nodes.<sup>9</sup>

Mesenteric cysts can be simple or multiple, unilocular or multilocular, and they may contain hemorrhagic, serous, chylous, or infected fluid.<sup>9</sup> The fluid is serous in ileal and colonic cysts and is chylous in jejunal cysts.<sup>1,12</sup> They can range in size from a few millimeters to 40 cm in diameter.

Approximately 10% of patients with mesenteric cyst presented with an acute abdominal emergency.<sup>21</sup> In a series of 82 children who underwent surgery for various causes of intestinal volvulus, mesenteric cysts were the underlying etiology in 3.65% of cases.<sup>22</sup> A very unusual presentation of a mesenteric cyst is that of an irreducible inguinal hernia.<sup>4</sup> The differential diagnosis includes intestinal duplication cyst; ovarian, choledochal, pancreatic, splenic, or renal cysts; hydronephrosis; cystic teratoma; hydatid cyst; and ascites.<sup>21</sup>

## RADIOGRAPHY

- Plain abdominal radiography may reveal a gasless, homogeneous, water-dense mass that displaces bowel loops laterally or anteriorly in the presence of a mesenteric cyst or posteriorly in the presence of an omental cyst.<sup>9,20</sup>
- Fine calcifications can sometimes be observed within the cyst wall.<sup>23,24</sup>

## ULTRASONOGRAPHY

- The imaging modality of choice is abdominal ultrasonography.<sup>12,14,15,24</sup> Ultrasonography reveals fluid-filled cystic structures, commonly with thin internal septi and sometimes with internal echoes from debris, hemorrhage, or infection.<sup>10,15,24,25</sup> However, these can be confused with large ovarian cysts in the fetus and newborn.
- Enteric duplication cysts, on the other hand, are thick-walled structures that share a common muscular wall with the adjacent bowel. They also have a clearly visible mucosal lining on ultrasonography.

## CT scanning

- Abdominal CT scanning adds minimal additional information, although it can reveal that the cyst is not arising from another organ such as the kidney, pancreas, or ovary.<sup>1</sup>
- Radionuclide scanning of the biliary tract excludes choledochal cysts from diagnostic consideration.<sup>21</sup>

The most common indication for surgical intervention is the presence of an abdominal mass with or without signs of intestinal obstruction. The goal of surgical therapy is complete excision of the mass. The preferred treatment of mesenteric cysts is enucleation,<sup>3,1,13,20</sup> although intestinal resection is frequently required to ensure that the remaining bowel is viable. Bowel resection may be required in 50-60% of children with mesenteric cysts, whereas resection is necessary in about one third of adults.<sup>3,10,12,14</sup> Any resulting mesenteric defect must be closed to prevent an internal hernia.

If enucleation or resection is not possible because of the size of the cyst or because of its location deep within the root of the mesentery, the third option is partial excision with marsupialization of the remaining cyst into the abdominal cavity.<sup>21</sup> Approximately 10% of patients require this form of therapy.<sup>3</sup> If marsupialization is performed, the cyst lining should be sclerosed with 10% glucose solution,<sup>11</sup> electrocautery, or tincture of iodine to minimize recurrence. Partial excision alone with or without drainage is not indicated because of the high recurrence rate associated with these procedures.<sup>3</sup>

Laparoscopic management of mesenteric cysts is also being reported.<sup>26,27</sup> In children, laparoscopy could be used to localize the cysts, and resection could be performed through a small laparotomy or via an extended umbilical incision. Overall results in pediatric patients are favorable. The recurrence rate ranges from 0-13.6%,<sup>10,12,13,14,16</sup> averaging about 6.1% in a series of 162 adults and children.<sup>3</sup> Most recurrences occur in patients with retroperitoneal cysts or those who had only a partial excision.<sup>3,13,14,16</sup> Essentially, no mortality is associated with mesenteric or omental cysts in children; only one pediatric death has been reported since 1950.<sup>28</sup> In a series from Egleston Children's Hospital in Atlanta, no major postoperative complications, recurrences, or deaths occurred.<sup>9</sup> Although rare, mesenteric cysts should be kept in mind in an intra-abdominal mass of unclear origin.

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# Newer Water Purification Techniques- A Review

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## ABSTRACT

Uncontaminated water does not occur in nature. Water gets contaminated by various gases, minerals, agricultural activities and urbanization. Various types of micro-organisms also contaminate water. Water has to undergo a purification process before it can be used for drinking purposes. Water is being purified since pre-historic times. Now-a-days water is being purified by various methods but research is being conducted to look for more reliable and cheaper methods that can purify water at an affordable cost. Various techniques have been developed like utilizing rechargeable polymer beads, seeds of Moringa Oleifera tree, aerobic granular sludge technology, resin based treatment and two-pronged water treatment technology. All these techniques can generate pure water. It is hoped that in coming times every person on this planet will be consuming pure and safe water.

**Keywords:** Water Water, Treatment, Pure Water, Affordable Cost

## INTRODUCTION

Water is essential for every living organism to survive and is needed by every cell of the organism's body to perform normal function. It covers 71% of the earth's surface, mostly in oceans and other large water bodies, with 1.6% of water below ground in aquifers and 0.001% in the air as vapor, clouds and precipitation.<sup>1</sup> Pure uncontaminated water does not occur in nature. It contains impurities of various kinds which can be natural or man-made. These comprise of various types of dissolved gases like nitrogen, carbon-dioxide, hydrogen sulphide and dissolved minerals like salts of calcium, magnesium, sodium etc. A more serious aspect of water-pollution is that which is caused by human activity, and industrialization<sup>2</sup>. There are also various micro-biological agents which can also cause water pollution if drinking water gets contaminated with these agents. The pathogenic agents involved include bacteria, viruses and protozoa which may cause diseases that vary in severity from mild gastroenteritis to severe and sometime fatal diarrhoea, dysentery, hepatitis or typhoid fever.<sup>3</sup>

Clean, fresh drinking water is essential to human and other life. Access to safe drinking water has improved steadily and substantially over the last decades in almost every part of the world. However, some observers have estimated that by 2025 more than half of the world population will be facing water-based vulnerability, a situation which has been called a 'water crisis' by the United Nations<sup>1</sup>.

The earliest recorded attempt to generate pure water dates back to 2000 B.C. Early Sanskrit writings outlined methods for purifying water. These methods ranged from boiling or placing hot metal instruments in water before drinking it to filtering that water through crude sand or charcoal filters. These writings suggest that the major motive in purifying water was to provide better tasting drinking water. It was assumed that good tasting water was also clean. People did not yet connect impure water with disease nor did they have the technology necessary to recognize tasteless yet harmful organisms and sediments in water<sup>4</sup>. Although various techniques have been developed in order to purify water so that it can be made safe and wholesome but large

scale purification involves lot of finances. Research is being conducted worldwide in order to develop newer methods which can be used to purify water and that too at an affordable cost.

### **Point-of-use water purification using rechargeable polymer beads**

'Halo-pure' is one such enabling technical advance in the development of an entirely new biocidal medium in the form of chlorine-rechargeable polystyrene beads that is based on patented chemistry inventions from the department of chemistry at Auburn University.<sup>5</sup> The discoveries were natural but creative outcome of a series of studies, covering more than a decade of research, focused on stabilizing chlorine on water insoluble, synthetic polymer surfaces.

The fundamental principles of the technology are deceptively simple to understand, although their incorporation into a reliably reproducible and practical medium for water sanitation has taken years of intense effort and research. Porous polystyrene beads are similar to those used for water softener resin beds, are modified chemically so as to be able to bind chlorine or bromine reversibly in its oxidative form. All that is required is enough free chlorine to surround the binding site. Almost no free chlorine is released when the beads are placed into the water flow. Typical levels range from 0.05 ppm to 0.20 ppm free available chlorine. This is not enough to kill anything without lengthy incubation. Hence, the swift efficacy of HaloPure depends on intimate contact between the microbes and the bound halogen on the polymer. What you have, then, is a solid surface, effectively biocidal on contact to contaminants in the water and repeatedly rechargeable when periodically exposed to free halogen. In this way, a powerful antimicrobial component can be introduced into a water purifier that will not run out of steam, and have to be discarded. Instead, it can have its power regularly and conveniently "topped up" by the user. Organisms make contact with the display of chlorine, for example, on the surface of the beads, and pick up enough halogen to inactivate them in short order. Those not killed within seconds suffer a near-death experience, and succumb quickly in the product water as the adherent chlorine slowly damages the organism to the point of fatal consequences.<sup>5</sup>

The technology holds the promise of reducing the impact of water borne diseases throughout the developing world. Its widespread use could contribute to the realization of UN goals for access to safe water for all by 2015. And it could do so without resort to the

massive infrastructure investments that are needed to reach this goal using more conventional centralized sanitation and distribution approaches.<sup>5</sup>

Water treatment using the seeds of the Moringa oleifera tree

Using natural materials to clarify water is a technique that has been practiced for centuries and of all the materials that have been used, seeds of the Moringa have been found to be one of the most effective. Studies have been conducted since the early 1970's to test the effectiveness of Moringa seeds for treating water.<sup>6</sup> These studies have confirmed that the seeds are highly effective in removing suspended particles from water with medium to high levels of turbidity (Moringa seeds are less effective at treating water with low levels of turbidity).

Moringa oleifera seeds treat water on two levels, acting both as a coagulant and an antimicrobial agent. It is generally accepted that Moringa works as a coagulant due to positively charged, water-soluble proteins, which bind with negatively charged particles (silt, clay, bacteria, toxins, etc) allowing the resulting "flocs" to settle to the bottom or be removed by filtration. The antimicrobial aspects of Moringa continue to be researched. Findings support recombinant proteins both removing microorganisms by coagulation as well as acting directly as growth inhibitors of the microorganisms. While there is ongoing research being conducted on the nature and characteristics of these components, it is accepted that treatments with Moringa solutions will remove 90-99.9% of the impurities in water.<sup>6</sup>

### **Water purification using aerobic granular sludge technology**

With the new aerobic granular sludge technology, aerobic (thus oxygen using) bacterial granules are formed in the water that is to be purified. The great advantage of these granules is that they sink quickly and that all the required biological purifying processes occur within these granules.<sup>7</sup>

The technology therefore offers important advantages when compared to conventional water purification processes. For example, all the processes can occur in one reactor. Moreover, there is no need to use large re-sinking tanks, such as those used for conventional purification. Such large tanks are needed for this because the bacteria clusters that are formed take much longer time to sink than the aerobic granule sludge.<sup>7</sup>



The aerobic granular sludge technology is very promising, and has been nominated for the Dutch Process Innovation Award. The technology is now in the commercialisation phase. In the coming years, further research will be continued. Testing of this purification method is being done on a larger scale. The first installations are already in use in the industrial sector.<sup>7</sup>

### **Resin Based Treatment for Colour and Organic Impurities Removal**

The rapid industrialization during the last few decades has resulted in tremendous increase in demand of water for industries. A large quantity of water used is ultimately discharged into water bodies and land as waste water from various unit operations related to various industrial processes, and is responsible for their pollution.<sup>8</sup> Attempts have been made to prevent the adverse aesthetic effects associated with industrial waste water discharges by accelerating the removal of colour during treatment of the variety of industrial wastes. Colour removal is also important if the water has to be made suitable for drinking purpose because many times underground water comes with colour and this colour has to be removed prior to drinking.<sup>8</sup>

Among the manufacturing operations, the textile dyeing and finishing industries are directly affecting colour; which is the most noticeable characteristic of both the raw waste and treated effluent from this industry. Although biological treatment of these waste waters is usually effective in removing a large portion of oxidizable matter, but it is frequently ineffective in removing colour. The present method for colour removal uses a green colour basic dye, an anion exchange resin called 'Duolite A 171/SC' and a column made of borosil glass of height 40cm. From the results it was concluded that resin treatment is a better method than conventional biologic process even at much higher filtration rate.<sup>8</sup>

### **Two-pronged water treatment technology**

A new water-treatment technique that combines two expensive methods could prove a cheaper and more efficient way to remove hard-to-clean contaminants. The technology combines photocatalysis, which uses light to break down pollutants, and electrochemical oxidation, which uses an electrical current to do the same.<sup>9</sup>

Photocatalysis and electrochemical oxidation have both been studied extensively for their use in water treatment but are not widely employed because neither

is efficient enough to justify the cost. In photocatalysis, ultraviolet radiation strikes a catalyst—often titanium dioxide—boosting electrons in the material to a higher energy state. This, in turn, leaves free positively charged holes to oxidize pollutants. But photocatalysis is not very efficient because often the electrons simply rebind to the holes. Electrochemical oxidation works by passing a current through a catalyst in water to oxidize pollutants. When combined with photocatalysis, this process boosts the efficiency in part because the current prevents the electrons and holes generated through photocatalysis from recombining.<sup>9</sup>

### **Summary and Conclusion**

It is very clear that water is an inseparable part of not only humans but of every organism on this planet. One cannot even think of surviving without water. We as humans, utilize water not only for drinking purposes but also to perform our daily activities like bathing, washing, cleaning etc. Water is also needed by every industry or factory as a basic raw material to manufacture any kind of product. Water intended for drinking purposes should be safe and wholesome so that it should not cause any disease or discomfort after drinking.

Water is being purified since pre-historic times by employing various techniques. With the advancement in science and technology, new techniques have come up to purify water not only for commercial purposes but also for domestic purposes. There are various new water purification techniques which have come up to purify water like purifying water by using rechargeable polymer beads, using the seeds of *Moringa oleifera* tree, purifying water by using aerobic granular sludge technology etc. It will take some more time and research before all these techniques can be implemented worldwide. Research is being conducted all over the world to develop more and more techniques which can generate pure water at low cost. All these techniques are being developed to ensure that in near future everyone will have access to clean and pure water and that too at an affordable cost.

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# A Pilot Study of Menstrual Problems in Adolescent Girls of Slum areas

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## ABSTRACT

**Background:** Menstrual problems are highly prevalent in adolescent girls. So an effort is made to study the menstrual problems in adolescent girls.

**Research question:** What is prevalence of menstrual problems in adolescent girls in slum areas?

**Objective:** Study menstrual problems in adolescent girls and its variation with the age.

**Study design:** Community based cross sectional study.

**Method:** 400 adolescent girls were interviewed from selected 10 urban slums of Solapur Municipal Corporation area.

**Results:** The average age of the participant was  $15.92 \pm 2.33$  years. 302 (75.5%) girls in the present study had either one or more menstrual problems. The most common menstrual problem was dysmenorrhea (45%). Followed by oligomenorrhea (15.25%), menorrhagia (13.75%) and polymenorrhea (8.25%). Prevalence of dysmenorrhea and oligomenorrhea was more in the higher age group while, menorrhagia and polymenorrhea decreases as the age advances. But overall menstrual problems were significantly less as the age of the adolescent advances ( $\chi^2 = 9.48$ ;  $P=0.01$ ). Significant number of adolescent girls had menstrual problems like dysmenorrhea, oligomenorrhea etc. So there is need to formulate appropriate counseling and management plans/ policies to tackle these problems.

**Keywords:** Adolescent, Menstrual Problem, Dysmenorrhea, Age

## INTRODUCTION

Menarche and menstruation are important aspects of female life. The early menstrual cycles in the adolescent girls may be unovular, irregular but are not devoid of problems for them. Irregular or abnormal menstruation can be a harbinger of a sinister pelvic pathology or denote a relatively minor problem, therefore through investigation into the problem is called for every patient presenting with complaint. The menstrual problem like dysmenorrhea is highly

prevalent in the teenage girls, affecting their routine work as well as the academic career.<sup>1,2</sup> Menstrual problems of adolescents has been poorly studied in slum set up of India. So study was conducted to study menstrual irregularities in the adolescent girls residing in slum areas. That may helpful to formulate and design menstrual health programs for adolescents.

**Material and Method: Study design:** Community based cross sectional study. Setting: Conducted in the urban slum areas of Solapur Municipal Corporation during June 2010 to August 2010. Study Sample: 400 adolescent girls in the age group 13- 19 years. Sample size estimation:  $4pq/L^2$  (5% absolute allowable error). Sampling technique: Initially list of slums were collected from the Solapur Municipal Corporation area. There were total 127 slums with varied population ranging from 500 to 10000. Out of 127 slums, 10 slums were

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selected by lottery method. It was decided to take 40 respondents from each slum by simple random sampling method. If the respondents found less in a particular slum then the remaining were covered in next big slum. The data was collected with the help of pre-tested & pre-designed performa by taking the informal consent of the adolescent girl. Interview was taken by skilled social workers making the rapport with respondents. The questions covered menstrual problems, regularity of menses in last three cycles of menstruation. Due care was taken so as to not hamper the privacy of the girl. Girls in the age group 13-19 years who had menarche for at least one year at the time of study were included in the interview. Analysis done by using SPSS version 12. Percentages were calculated for drawing the references. Chi square test was used to test the level of significance.

#### Definitions of the menstrual problems:<sup>1</sup>

1. Dysmenorrhea: means painful cramping pain accompanying menstruation.
2. Oligomenorrhea: denotes infrequent, irregularly timed episodes of bleeding usually occurring at intervals of more than 35 days.

3. Menorrhagia: denotes regularly timed episodes of bleeding that are excessive in amount (>80 ml) and/or duration of flow (> 5 days).
4. Polymenorrhea : denotes frequent episodes of menstruation, usually occurring at intervals of 21 days or less.

## RESULTS

Total 400 adolescent girls were studied. Out of 400, 102 (25.5%) were in the age group of 13-14 years followed by 115 (28.75%) in 15-16 years and 183 (45.75%) of more than 17 years. The average age of the participant was  $15.92 \pm 2.33$  years. 302 (75.5%) girls in the present study had either one or more menstrual problems. The most common menstrual problem was dysmenorrhea (45%). Followed by oligomenorrhea (15.25%), menorrhagia (13.75%) and polymenorrhea (8.25%). Prevalence of dysmenorrhea and oligomenorrhea was more in the higher age group while, menorrhagia and polymenorrhea decreases as the age advances as shown in table-1. But overall menstrual problems were significantly less as the age of the adolescent advances ( $\chi^2 = 9.48$ ;  $P=0.01$ ).

**Table- 1 Age-wise distribution of Menstrual Problems in Adolescent Girls (N=400).**

Menstrual problems	Age of the Adolescent Girls							
	13-14 year		15-16 years		>17 years		Total	
	No.	%	No.	No.	%	No.	No.	%
Dysmenorrhea	43	23.89	56	31.11	81	45.00	180	45
Oligomenorrhea	14	22.95	19	31.15	28	45.90	61	15.25
Menorrhagia	25	45.45	18	32.73	12	21.82	55	13.75
Polymenorrhea	13	39.39	10	30.30	10	30.30	33	8.25
No Menstrual Problem	18	18.37	22	22.45	58	59.18	98	24.5

## DISCUSSION

Menstruation though a normal physiological process but many times is associated with various abnormalities affecting the day to day work of the adolescent. 75.5% girls in the present study had menstrual problems but Deepali S Deo et al<sup>3</sup> found 83.54% adolescent having either one or more menstrual problems.

The prevalence of dysmenorrhea in the present study was 45%, exactly similar (45%) finding was observed by Widholm O<sup>4</sup>. But Singh A et al<sup>5</sup>, Zegeye DT et al<sup>6</sup>, Avril M Houston et al<sup>7</sup> and Sharma P<sup>8</sup> found high prevalence of dysmenorrhea i.e. 73.83%, 72%, 65% and

67.2% respectively. Deepali S Deo et al<sup>3</sup> found less percentage (31.64%) of dysmenorrhea in their study. The variation may be due to tolerance and acceptance of the symptoms among the selected study groups.

15.25% girls in the present study had oligomenorrhea similar finding (11.3%) was observed by Bachmann GA et al<sup>9</sup>. In the present study 13.75% girls had problem of menorrhagia. Similarly Deepali S Deo et al<sup>3</sup> and Avril M Houston et al<sup>7</sup> found menorrhagia in 10.13% and 8.6% of adolescent girls respectively. Polymenorrhea was observed in 8.25% adolescent girls but Deepali S Deo et al<sup>3</sup> noted the prevalence of polymenorrhea in only 1.26% girls which was very low as compared to present study. Present

study shows that the problem of dysmenorrhea and oligomenorrhea was more as the age of the adolescent advances. This finding was similar to Widholm O<sup>4</sup>.

**Conclusion and Recommendation:** This study shows significant number of adolescent girls had menstrual problems like dysmenorrhea, oligomenorrhea etc. So there is need to formulate appropriate counseling and management plans/policies to tackle these problems.

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# Double Blinded Randomised Controlled Trial Comparing Lidocaine Viscous and Lidocaine Lozenges Prior to Upper Gastrointestinal Endoscopy

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## ABSTRACT

**Background:** Upper gastrointestinal endoscopy is a commonly performed procedure now days for various indications. Usually it can be done as an outpatient procedure without anaesthesia and sedation. Local pharyngeal anaesthesia is used in the form of gel, viscous and spray. Recently there is introduction of lidocaine lozenges for this purpose with many benefits.

**Objective:** Purpose of this study was to compare the safety, efficacy and patient comfort for the lidocaine viscous and lidocaine lozenges as a single agent local pharyngeal anaesthesia before upper gastrointestinal endoscopy.

**Design:** Double blinded randomised prospective study.

**Patients:** 100 consecutive patients undergoing upper gastrointestinal endoscopy.

**Methods and Interventions:** Randomisation of patients was done into lidocaine viscous group and lidocaine lozenges group before the procedure and the endoscopist and patients were interviewed separately after the procedure. Anxiety, Gag reflex, difficulty of procedure and tolerability of the procedure were graded by the patients and endoscopist.

**Results:** Patients in the lozenges group exhibited less discomfort, tolerated the procedure better than that in the viscous group. The endoscopist experienced lesser difficulty in performing the procedure. None of the 100 patients needed any form of anaesthesia and all completed the procedure.

**Conclusions:** Lidocaine lozenge is a better alternative for local pharyngeal anaesthesia before upper gastrointestinal endoscopy. It resulted in lesser discomfort and increased tolerability of the procedure, for the patient and lesser difficulty in performing the procedure, for the endoscopist.

**Keywords:** Lidocaine Lozenge, Upper Gastrointestinal Endoscopy, Lidocaine Viscous, Comparative Study.

## INTRODUCTION

Upper Gastro Intestinal (UGI) endoscopy is well recognized as an important diagnostic and therapeutic tool in Clinical Gastroenterology<sup>1,2</sup>. It is considered as a safe and painless procedure, but significant complications can occur as a result of instrumentation, such as bleeding, perforation and infection, with a frequency that approximates 0.1%. Cardiopulmonary complications may account for over 50% of all reported complications, with the majority because of aspiration, over sedation, hypoventilation, vasovagal episodes, and airway obstruction<sup>3,4</sup>. Most endoscopies are performed with the patient under moderate sedation and

analgesia, which is also known as “conscious sedation.”<sup>3,4,6</sup>. Sedation delays patient recovery and discharge, in addition, sedated patients require close monitoring during and after the procedure, and may have post procedure amnesia with poor recall of instructions<sup>1,5,8</sup>. Upper GI Endoscopy is performed without sedation in many countries<sup>9</sup>. Although there is adequate evidence that un-sedated endoscopy is technically feasible in selected patient populations, there are number of obstacles preventing its widespread adoption.<sup>10</sup>. Small Diameter endoscopes (less than 6 mm) can improve the tolerability of upper GI endoscopy.<sup>7</sup>. Unsedated patients experience more discomfort during endoscopy than sedated patients,

but few studies have examined factors which could be modified to minimize discomfort during the procedure<sup>9</sup>. Topical use of Lidocaine in upper GI Endoscopy has been documented in medical literature. Different formulation of Lidocaine, like gel, spray, inhaler and lozenges have been used for this procedures<sup>1,3,4,7,11-13</sup>. Use of Lidocaine spray in patients undergoing un sedated upper gastrointestinal endoscopy has been associated with higher procedural completion rate, greater ease of intubation, and greater patient and physician satisfaction<sup>11</sup>. Spray is irritating for some people and leaves bitter taste in the throat<sup>14</sup>. Lidocaine viscous is also being used for this purpose. The lidocaine lozenge on a stick is a novel method of providing local oropharyngeal anaesthesia. It proved as a simple and effective method of providing anaesthesia to the upper airway, thus allowing safer and more successful tracheal intubation. Ayoub C, et al examined the efficacy of topical lidocaine, administered as a lollipop, as a single-agent anaesthetic for UGI endoscopy. Authors concluded that Lidocaine lozenge is a promising form of local anaesthesia for EGD. They also confirmed the safety and tolerability of Lidocaine lozenges in UGI endoscopy<sup>1</sup>.

### AIM

Aim of this study is to compare the efficacy, safety, ease of use and endoscopist and patient's comfort with the use of lidocaine viscous and lidocaine lozenges as a single agent topical pharyngeal anaesthesia before performing UGI endoscopy.

### PATIENTS AND METHOD

Consecutive patients who underwent upper gastrointestinal endoscopy at SS institute of medical sciences and research centre, Davanagere, within the age range of 18 to 80 years were included in the study. Patients with allergy to lidocaine, pregnant and lactating mothers, patients with emergency indications and patients with co-morbid conditions like cardiopulmonary disease were excluded from the study. Informed written consent was taken from the included patients. Selected patients were randomly divided into two groups – Group A and Group B. Patients in Group A received Lidocaine Lozenges 200 mg. Patients in Group B received Lidocaine viscous equivalent to 200 mg lidocaine. All the patients had intravenous access and were monitored using a pulse oximeter. All the emergency care facilities such as emergency drugs, laryngoscope, oxygen cylinders, on call anaesthetist were available for any untoward effects. The procedure was performed using the Pentax EG 2985K endoscope

with the insertion tube diameter of 9.8 mm. The procedure was performed by the endoscopist, who was blinded for the randomisation procedure. Immediately after the procedure the investigator filled in questionnaire rating the ease of the procedure, the level of the gag reflex of the patient (on a scale of 1 to 5, 1 being strong gag reflex and 5 being absent gag reflex) and the ease of application of the medication. The patients filled the questionnaire evaluating the patient's tolerability for the procedure and the symptoms experienced during and after the procedure (especially, nausea, vomiting, cough and pain). Group A patients who received the lozenges were asked to keep the 200 mg lidocaine lozenge inside the mouth and suck it by rolling it side to side 15-20 minutes before the initiation of the procedure. Saliva produced while sucking the lozenge was asked to be swallowed. Eating and drinking while using and 1 hour after using Lidocaine Lozenges 200 unit was not allowed. The handle of the used unit was appropriately disposed off even if it had no/little medication left on it. Patients in each group were asked to grade their level of anxiety on a scale of 5 (1 being least anxious and 5 being very anxious). Soon after the procedure the endoscopist evaluated the patient's gag reflex and graded it on the scale of 5 (1 being absent gag reflex and 5 being strong reflex). Difficulty of the procedure was graded by the endoscopist, depending on the grade of gag reflex, restlessness, retching, in the scale of 5 (1 being easy and 5 being very difficult). After the procedure, patients were also asked to grade the tolerability of the procedure on a scale of 5 (1 being no difficulty and 5 being very difficult). Patients were again interviewed 2 hours after the procedure for noting the side effects of the local anaesthetic and the procedure.

### STATISTICAL ANALYSIS

Mean and standard deviation was calculated using the standard deviation calculator from 'easy calculation.com', the T test was done using the 'independent group T test calculator' of Dimension research inc. And the p value was calculated using 'Quickcalcs' p value calculator'.

### RESULTS

The present study was conducted on 100 consecutive patients. The mean age group in the viscous group was 47.44+/-17.84 and that in the lozenges group was 45.36+/-19.25 and the p value was 0.5765 and. Twenty eight percent and thirty four percent of patients in viscous and lozenge groups respectively were females <sup>table 1</sup>.

**Table 1. Patient characteristics.**

Characteristics	Viscous group n=50	Lozenges group n=50
Age(mean)	47.44+/-17.84	45.36+/-19.25
Sex	14(28%)	17(34%)
Alcoholic	13(26%)	15(30%)
Smoking	17(34%)	14(28%)
Tobacco in other forms	11(22%)	14(28%)
Previous h/o endoscopy	10(20%)	8(16%)

The mean anxiety level of the viscous group was 2.76+/-1.45 and that of lozenge group was 2.68+/-1.40 and the p value was 0.7801. Hence it can be said that the difference was not significant. Mean score of gag reflex in the viscous group was 3.22+/- 1.26 and in the lozenge group was 2.6+/-1.10 and the p value was 0.0106. In our series none of the patients required any form of sedation and the endoscopy was completed in all the patients. Mean difficulty grade in the viscous group was 3.42+/-1.03 and in the lozenge group was 2.22+/-1.07 and p value was 0.0001. The mean tolerability grade for the viscous group was 3.18+/-1.24 and for the lozenge group was 2.46+/-1.16 and the p value was 0.0035<sup>Table 2</sup>.

**TABLE 2. Mean values of different variables in either groups.**

Variables	Viscous group	Lozenge group	P value
Patient anxiety	2.76+/-1.45	2.68+/-1.4	0.07801
Gag reflex score	3.22+/-1.26	2.6+/-1.10	0.0106
Difficulty grade	3.42+/-1.03	2.22+/-1.07	0.0001
Patient tolerability	3.18+/-1.24	2.46+/-1.16	0.0035

## DISCUSSION

Lidocaine lozenges have been used successfully as a form of single agent anaesthesia before performing upper gastrointestinal endoscopy<sup>15</sup>. Sedation has been used in patients undergoing endoscopy, as the procedure is interventional and many patients would not tolerate the procedure without it, but sedation itself has got many side effects<sup>18,20-27</sup>. Upper GI scopy is yielding in case of elderly patients hence should not be omitted just because of age<sup>16,17</sup>, and it has been proved to be a safe procedure in this age group when done without sedation<sup>10,16,17,19,20,25,32,34</sup>. Controversy is still there regarding the use of sedation in elderly patients<sup>16,17,20,21,22,24,25,26,29,32</sup>. There are different studies which have examined the effect of local pharyngeal anaesthesia and the value is controversial<sup>30,32,33</sup>, some claiming the benefit of lidocaine<sup>31</sup>, lidocaine gel<sup>33</sup> and some claiming no benefit of lignocaine spray in performing UGI endoscopy and reiterated the need of

sedation for the same<sup>27,28</sup>. In a study by Chakib Ayoub et al, the author concluded that lignocaine lozenge is a promising form of oropharyngeal anaesthesia before performing UGI endoscopy, spares the use of intravenous sedation, well tolerated by the patients and safe in elderly patients. The author also recommends the need for further studies to verify his results<sup>15</sup>. The present study is conducted at SSIMSRC, davanagere. Lignocaine viscous has been used in this setting at our institute since a long time. This study compared the use of lignocaine viscous with lignocaine lozenges.

The anxiety effect in our patient series was excluded because of the almost similar anxiety score in either of the groups, the p value being 0.78 which is statistically insignificant.

The mean gag reflex score in the viscous group was more than that in the lozenge group with a significant p value of 0.0106, hence we found the lidocaine lozenges to cause lesser gag reflexes in the patients than the lidocaine viscous, thus lessening the patients' discomfort and making the procedure easier for the endoscopist.

The mean difficulty grade for the endoscopist in the viscous group was more than that for the lozenges group with a significant p value of 0.0001, hence we can opine that the lidocaine lozenges lessens the difficulty the endoscopist faces while performing the procedure. This can be because of the lessened gag reflexes with lozenges and increased patients' co operation.

The mean patients' tolerability score for the procedure with viscous was more than that for the lozenges with the p value of 0.0035 which is statistically very significant, hence we conclude that the lidocaine lozenges increases the patients' tolerability and acceptability for the procedure.

In conclusion, lidocaine lozenge is a better alternative for the local pharyngeal anaesthesia before performing upper gastrointestinal endoscopy as it provides better tolerability and comfort for the patient and lessens the difficulty in performing the procedure for the endoscopist. The other benefit of the lozenges is its better taste and hence the patients co operation and acceptance of the medication especially in children and un co-operative patients. Added advantage can be that the patient can always stop taking the medication and spit it if he or she does not like to go further.



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# A Three Year Retrospective Study of Carcinoma of Breast in Young Females at Davangere

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## ABSTRACT

**Background:** Carcinoma of the breast is the most common cancer in women in many of the western countries<sup>1</sup> and becoming the leading cancer in developing countries such as India<sup>2</sup>. Cancer breast in women younger than 30 years of age is rare<sup>3</sup> and is particularly of more concern because of the special considerations such as pregnancy, fertility and sexuality<sup>4</sup>.

**Objective:** The objective of this study is to evaluate the incidence of cancer breast in women aged less than 30 years and to study the prognostic factors in patients treated in our institute and to compare the same with national and international statistics.

**Methods:** cancer breast statistics was collected from the medical records department of our institute, the pathological data concerning the type of tumor, stage, grade, lymphnode involvement was collected from the department of pathology and the data was tabulated, evaluated and compared with the national and international statistics.

**Results:** in our study the incidence of cancer breast in 30 years and less than 30 years of age is 4.67% with the mean age of 27+/-3.8, mean tumour size was 4.4+/-1.2cms, lymph node metastasis was seen in 60% of patients, mean number of lymph nodes positive for metastasis was 6.14+/-1.87, most common histological type of tumour being infiltrating ductal carcinoma(60%) and the most common histological grade was grade 2 in 60% of patients.

**Conclusion:** carcinoma of breast is quite commoner in young women less than 30 years and has got an unfavourable prognosis and hence the diagnosis has to be kept in mind while evaluating for a breast lump in younger patients.

## INTRODUCTION

Carcinoma of the breast is the most common cancer in women in many of the western countries<sup>1</sup> and becoming the leading cancer and cause of death in developing countries such as India and Pakistan<sup>2,5</sup>. Cancer breast in age less than 30 is considered as a risk factor because of increased chances of more advanced disease in this age group when compared to the other age groups<sup>6</sup>. It is becoming more commoner all over the world. According to SEER data, since broad surveillance of cancer began in 1975, incidence rates of invasive female breast cancer for all races combined show four distinct phases: Between 1975-1980, incidence rates were essentially constant, Between 1980-1987, incidence rates increased by 3.7% per year, Between 1987-2001, incidence rates increased by 0.5% per year, Between 2001-2004, incidence rates decreased by 3.5% per year<sup>7</sup>. Cancer breast in women younger than 30 years of age is rare<sup>3</sup> and is particularly of more

concern because of the special considerations such as pregnancy, fertility and sexuality<sup>4</sup>. Cancer of the breast in patients less than 30 years of age is reported to be less than 5% and in some studies it is reported to be less than 1%<sup>3,6</sup>. Incidence of cancer breast is increasing compared to previous decades and especially so in younger patients. Murthy NS et al, studied the changing trends in cancer breast with special reference to India and collected the cancer breast statistics from all over India from different city registries and measured the trend over the period and named it as mean annual percentage change (MAPC). Increase in the MAPC was noted in all the age groups but was maximum in the youngest age group, which means that the increase in incidence compared to past years, in the younger than 30 years is more than that for the older age.<sup>2</sup>

Breast cancer in younger patients tend to be more aggressive than in the older age group and the prognosis will be more grave. Five year survival rates in younger

patients (less than 40 years) tend to be lower than in patients older than 40 and the response to the treatment will be less in the former group<sup>8,9,10,11</sup>.

## MATERIALS AND METHOD

The data of three years (January 2008 to December 2010) regarding the carcinoma breast admitted and operated at SS Institute Of Medical Sciences Davanagere was taken from our institutional Medical Records Department. Data of total 294 patients were taken, among which there were 14 patients whose age was less than 30 years, was selected for the study. Those patients who were admitted more than one time either for chemotherapy or otherwise was considered as one patient only.

These selected patients were assessed in the department of pathology SSIMSRC, for the type of tumour, grade, tumour size, lymph node involvement including number of lymph nodes recovered and number of lymph nodes positive.

The data thus obtained was scrutinised and assessed and statistical parameters such as mean, mode, standard deviation, frequencies and percentages were calculated for different variables.

## RESULTS

In our institution totally there were 295 cases of cancer breast treated from January 2008 to December 2010, out of which 14 (4.67%) cases were 30 or less than 30 years of age. Age group ranged from 18 to 30 years with mean age of 27+/-3.8 years. The tumour size ranged from 2 to 6 cms with mean size of 4.4+/-1.2 cms. Number of lymph nodes involved with metastasis ranged from 4 to 9 with mean of 6.14+/-1.87. The most common type of tumour was infiltrating ductal carcinoma in 64.2% of patients followed by the adenocarcinoma in 21.4% and lobular carcinoma in 7.1%. Size of the tumour ranged from 2 to 6 cms with 78.5% of tumours in the range of 2 to 5 cms and 22% in the range of >5cms and none of the tumours was less than 2 cms. Histological grade of the tumours was assessed and majority (60%) were grade 2 and 10% were grade 3, rest of the tumours' grade could not be assessed. Lymph node metastasis was present in 9 (64%) patients and the number of lymph nodes positive varied from 4 to 9 with the mean of 6.07+/-1.85.

## DISCUSSION

Breast cancer is the most common cancer in women in the western world and becoming the leading cancer in women in the developing countries including India. It is one of the leading causes of death in women all over the world<sup>12</sup>. Carcinoma of the breast is more

commoner in post middle age than in the young and middle age. The probability of developing cancer breast within next 10 years in young women less than 30 years of age is one in 229 women, whereas by 50 it is one in 42 and by 60 it is one in 29 women<sup>13</sup>. The incidence of breast cancer in young women less than 30 in United states is 5% and age less than 30 years is considered as a risk factor for aggressive disease<sup>6</sup>. According to SEER data from 1975 to 2000, incidence of the cancer breast in less than 30 is less than 1% and it steadily increases with age and then stabilises and then drops a little after the age of 80 years<sup>3</sup>.

In a study conducted in United states, the highest incidence of cancer breast is seen in African Americans followed by Hispanics, American Indians, non white Hispanics and Asians<sup>14</sup>. According to Kroman et al, a Danish study, the incidence in women less than 35 years of age is 8.3%<sup>15</sup>. A study done in UK showed that the incidence in less than 30 years age group is 2% of the total cases<sup>16</sup>. In Australia, according to Brennan et al, the incidence in younger women less than age 30 is 2%<sup>17</sup> and according to Hickey et al, it is 6%<sup>18</sup>. According to Anayanwu, the incidence in less than 30 years age is about 8% in third world countries<sup>19</sup>. Study done by Tabbane showed it to be 3.8%<sup>20</sup>. On the contrary, in Pakistan, cancer breast is proved to have a higher incidence in younger women according to different studies conducted by Nadira mamoon et al and Siddiqui et al, the incidence is 10.2% and 18% respectively<sup>12,21</sup>.

Overall incidence of cancer breast is increasing in all age groups in most parts of the world and more in the younger age group less than 30 years. In a study conducted by Murthy NS et al, they calculated the 'mean annual percentage change' (MPAC) in the incidence of carcinoma breast in different age groups. They collected the data from the registries in different parts of India such as Chennai, Mumbai, Bangalore and Nagpur. They found an increase in MPAC in all the age groups in all the registries. The MPAC in the youngest age group of 15 to 34 years were 2.28, 1.42 and 5.89 where as for the oldest age group of >65 years ranged from 0.97 to 2.35 in Chennai, Mumbai and Nagpur respectively<sup>2</sup>.

The incidence of cancer breast varies in different ethnic groups. It is more common in some of the ethnic groups as compared to the others. The incidence is highest in the world, in Israeli Jews and the lowest in some of the neighbouring Arab countries and in Israeli Arab Muslim populations<sup>22-27</sup>. This marked difference in the incidence within such a small geographical difference is because of the highly varying lifestyle and possibly of the different genetic framework<sup>28</sup>. In Arab populations, the practice of breast feeding is highly prevalent and according to what is prescribed in Islam<sup>29</sup>.

In a study conducted by Goldhirsch A et al, there was a decreased five year survival rates, the tumour was more aggressive and less responsive to treatment as compared with the older age group<sup>30-34</sup>. According to Daling JR, the increased risk of breast cancer in young patients was more, especially in the patients who are diagnosed within a short period after the child birth<sup>34-36</sup>. On contrary to this, some studies suggest that there is no increased risk of mortality associated with childbearing after cancer breast diagnosis<sup>37-39</sup>.

In conclusion, carcinoma of breast is quite commoner in young women less than 30 years and has got an unfavourable prognosis and hence the diagnosis has to be kept in mind while evaluating for a breast lump in younger patients. Larger comparative studies, comparing the incidence and age intervals are required.

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# General Life Status and Risk Perception on STI-HIV among Street-Based Female Sex Workers between 18 and 25 Years Old in Bangalore, India

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## ABSTRACT

**Objective:** Unsafe sex is the main cause of the spread of Human Immunodeficiency Virus (HIV) in India. Female sex workers (FSWs) are a high-risk group for HIV and other sexually transmitted infections (STI). It is imperative for FSWs to know the danger of unsafe sex to reduce HIV transmission. The purpose of this study is to get a general picture of the life status, awareness of HIV-STI and risk perception among street-based FSWs between 18 and 25 years old in Bangalore, India, and discover some sociocultural factors that facilitate the spread of HIV and STI.

**Materials and Methods:** Based on a specific questionnaire we designed, qualitative data were collected. Data were also collected using semi-structured group interviews with FSWs through a focus group discussion (N=14) and individual interviews (n=20).

**Result and Conclusion:** General life status for most sex workers is not optimistic. Complex FSW-police relationship, stigma and discrimination, going away from main stream and living in isolation may result in self-abandonment in sex workers, creating extra risks for HIV prevention. Although the majority of FSWs have acquired a basic knowledge of HIV-STI with misconceptions, the practice of unsafe sex still persists. Therefore it is urgent for FSWs to increase their knowledge on HIV-STI, to know how to protect their rights and get more help from the society.

**Keywords:** HIV-STI Awareness; Risk Perception; Street-Based Female Sex Workers; Sociocultural Factors.

## INTRODUCTION

Female sex workers are a high-risk group for Human Immunodeficiency Virus (HIV) and other sexually transmitted infections (STI), which can be attributed to their special work. Among them, street-based Female Sex Workers (FSWs) between 18-25 years old have more customers on average, which means they play more significant roles in spreading of HIV compared with older FSWs. Unsafe sex is the greatest cause of spread of HIV in India and there is a concentrated HIV epidemic among female sex workers.<sup>1,2</sup> So, it is imperative for the reduction of transmission of the disease that FSWs know the dangers of unsafe sex. In this qualitative study, we hope to paint a genuine picture of life status, awareness of HIV-STI and risk perception among street-based FSWs between 18 and 25 years old,

thus paving the way for future work of HIV protection in Bangalore, India.

## MATERIALS AND METHOD

The study is a component of a series of investigations carried out by S.P.A.D. (Society for People's Action for Development), a local Non-Governmental Organization devoted in social work, educating vulnerable community about HIV and providing clinical help for the high risk group of HIV. This study reports on a general assessment of life status, HIV awareness and risk perception among street-based FSWs between 18 and 25 years old in Bangalore, India.

The whole study was comprised of the following parts: observing and communicating with FSWs, focus

group discussion and individual semi-structured interviews, result analysis. Most FSWs in this area have registered in the Drop-in Center (DIC) of the HIV Prevention project of S.P.A.D., which made sure that all the samples we collected in the study were all currently sex workers. The DIC also has a clinic for the clinical services, providing free clinical help only for sex workers. These sex workers have good relationships with staff in the DIC, this provided us a big advantage in collecting study samples.

By interacting with them with the help of staff available in the clinic, a rapport was built with the community, which paves way for further investigation. With the help of staff in the DIC, researchers randomly chose 14 FSWs who were willing to join in the group discussion and another 20 FSWs who were willing to be interviewed by the researchers. Doctors in the clinic provide free physical examination for FSWs every week at a certain time, many sex workers will come and wait for the examination during this period, so it gave us a chance to find FSWs for the study. All of those coming for the examination have registered in the DIC before. Participants were eligible if they were aged between 18-25 years, then random sampling were used to choose FSWs. These FSWs were fully briefed about the study objectives and procedures, those who agreed by verbal consent were considered voluntary participants. Participants then chose to take part in either a focus group discussion or an individual interview. The focus group discussion was held in the DIC, while the individual interviews were made at a time and location convenient to each participant. Based on the information we collected, a specific semistructured questionnaire was designed in order to collect data through the group discussion and the interview. Further questions were added when necessary according to the situation of the interview.<sup>3</sup> The questionnaire-based interviews include mostly open-ended questions on knowledge and risk perception of HIV, a few multiple choices were added for outlines of answers to the question. As many FSWs are illiterate and know only local language Kannada, the staff of S.P.A.D. worked as Kannada-English translators. Finally, we gathered all the information, did the analysis work and got the results of the study.

## OBSERVATION & RESULTS

### A. General Life Status

The general life status of these FSWs is not optimistic. Most of them are widows or deserted or remarried, with one or more children. Few of them feel happy about their family life.

(1) Financial burden is the main reason for these women to be FSWs.

All the FSWs interviewed have a heavy financial burden. In most cases, the husband died or deserted them, leaving them making a living and raising their children themselves. Nearly half of the FSWs said they didn't like this job: 12 in 20 said once they get another job and get out of financial burden, they would not sell sex again. Stigma and discrimination still exist to their current job, but their education status is far from enough to help them to find a well-paid job.

(2) Some FSWs are subjected to Domestic Violence

One FSW lives with her husband and her baby, she is sad because her husband doesn't care about them and always abuses her. She wants to leave her husband but she doesn't have another place to live. Selling sex was the only way to make enough money to eke out living. Another FSW said she began doing sex work after she got married as her husband is an alcoholic and he would always beat her when he is drunk. She said that she couldn't earn enough to make a living and look after her parents herself, if she left her husband. From this point of view, women's rights and interests are far from protected in some cases.

(3) Many FSWs are in poor health conditions.

Although they can receive free clinical help in the DIC run by the NGO, during interaction with them, we find that some of them don't look well with good health. They look tired and older than their age. One possible reason is that they are in poor health condition due poor diet and overwork for money. Their health problems may become more severe in the future, this problems needs extra attention .

(4) Some FSWs have some psychological stress and problems

One FSW can speak fluent English, she looks nice and always prefers to share things with other FSWs. She is found to be very emotional and sentimental. There could be many among FSWs due to professional stress and duress that they undergo. For these FSWs some psychological help, if provided, they can live a much better life. Another FSW interviewed has serious alcoholic problem. The staff in DIC told us that alcoholism and fighting after they are drunk is common among FSWs. The problem of alcoholism is not only bad for their health and safety but also increases risk of HIV infection.

(5) Violence from police

It is found that one third of the respondent FSWs are faced with violence from the police, and they all chose to ask help from S.P.A.D. rather than the police when their legal rights are infringed. They said police are brutal and ask the women for bribes to circumvent arrest.



But a local police officer stated that some FSWs steal valuables or cash from clients. The contradicting accounts given by the Police and FSWs speak of a complex and erratic FSW-Police relationship. Therefore, communication and negotiation between S.P.A.D. and police needs to be strengthened.

(6) Lack of financial management skills among FSWs may explain their poverty

From the result of our questionnaire we can see that FSWs generally get good earning from their work, but somehow most of them don't save money. Their income just covers their daily expenditure. It is presumed that they lack the basic knowledge of managing their money and therefore, they squander the money improperly. So we think teaching them useful managing skills may help solve their financial burden, which in turn will benefit them in many ways.

## B. HIV-STI Knowledge

Most FSWs have acquired the basic knowledge of HIV-STI but some misconceptions do exist. Participants were first asked whether they had heard of HIV and STI, and, if so, how to define or describe each of them, then they were asked the relationship between HIV and STI and more details including symptoms and ways through which they might be infected. After this, participants were asked about some tests and certain treatments of STI and HIV. At last, they were asked about their practice of safe and unsafe sex to see their risk perception. Results reveal that most FSWs interviewed have acquired the basic knowledge of STI and HIV, but some misperceptions do exist.

(1) General HIV-STI awareness.

All of them have heard of HIV and know it as an incurable disease which can be transmitted through sex without the use of condom, but misconceptions of the disease still widely exist. All but one know STI as Sexually Transmitted Infections and know that HIV belongs to STI. Three quarters of them know STI can increase the risk of being infected by HIV virus. Almost all of them receive these knowledge from the clinic (DIC) of S.P.A.D..

The question asking how one can get STI is outlined by multiple-choices. All of them know that vaginal sex without protection is a way to get STI (18 in 20), only 7 of them know that analogous sex behavior such as oral sex, anal sex, masturbation and indirect contact with pathogen can also be ways to get HIV infection. When asked about common STIs they know, 16 of them have heard of syphilis and gonorrhoea, but none of them can think of names of STIs themselves. Their knowledge concerning the symptoms of certain STI is very vague. It's hard for them to describe symptoms of STI by

themselves without telling them the potential choices. 7 of them had received STI treatment before. After telling them the potential choices which include vaginal smelly discharge, vaginal itch, ulcer, pelvic pain and infertility, 18 of them responds of knowing the first four symptoms, but only 9 know that infertility is also a symptom of STI.

When asked about how HIV can be transmitted from one to another, 19 of them can tell the three ways including unsafe sex, blood transfusion and mother to baby transmission, but only half of them know sharing unsterilized needles in drug abuse can also lead to spread of the disease. Doctors in the clinic told us that drug abuse was rare among these FSWs.

(2) Test and treatment of HIV-STI

Among the 20 FSWs, 17 responded of knowing what is 'speculum examination' and 16 of the 17 say they have got this examination at the clinic. Since speculum examination is an important way to trace FSWs' potential infections,<sup>4</sup> it is felt that this result is not satisfactory. Among these respondents, 18 know that HIV can be tested in the ICTC clinic (The special testing centre where tests for HIV is conducted). All of them believe that STI is curable and HIV is incurable. Some of them said that they have received STI treatment before for their ailment. Few of them said that they have heard of ART (anti-retrovirus therapy) as a treatment for patient with HIV infection.

(3) Risk perception of HIV-STI

All respondents know that using condom is the most effective way to protect themselves from contracting STI/HIV. Most of them have received at least one condom demonstration from peer educators. However, only a few of them say they never have sexual contact without a condom when entertaining a client. Reasons for 'unsafe sex' include refusal to use condom by clients, trust on regular client and most of all fear of losing clients. Almost all of them have received training from peer educators on skills concerning how to persuade clients using condoms. Only a few say that persuading clients to use condom is still a problem for them.

Among the 20 interviewed, 13 said they have a steady/permanent non-commercial sexual partner. Only very few said they use condom with their regular sexual partner. Most of them think it's not necessary and some said that they were not informed of the necessity of using condom with permanent partner.

Many FSWs admitted consuming alcohol regularly before sexual encounters. Use of alcohol before sex may result in failure to use condom which is a risk to safe sex.

To a more specific question concerning ways to prevent HIV during pregnancy and after delivery, less than half could tell properly the methods of prevention. Most of the FSWs interviewed haven't heard about this problem. Without enough medical intervention, the risk for HIV positive mothers passing on the disease to their children is very high, therefore, instructions on how to prevent HIV during pregnancy and after delivery need to be highlighted to FSWs.

## DISCUSSION

The general life status for most sex workers are poor and unhealthy, they are not educated and don't have a skill to find another job, they have heavy financial burden, they don't have a satisfying family or even faced with domestic violence, and all these are factors that reduce them to the sex work field. Bad habits like excessive drinking, fighting, stealing contribute to the complex and erratic FSW-Police relationships. Stigma and discrimination to sex workers in the society may lead to self-abandonment of some FSWs, which is a fatal flaw for the prevention of HIV, because those self-abandoned don't care about their life or the others, they don't use condoms and even continue to do sex work when they are HIV positive. Therefore, attention must be raised to in these sociocultural aspects. The FSWs should also be taught how to protect their rights in the face of sexual assault and violence.<sup>5</sup>

The majority of FSWs have acquired a basic knowledge of HIV-STI, although there are still some misconceptions which should be paid attention to in peer education. From the staff in the DIC, we know that all FSWs are provided with enough condoms they need, and they all know where to get extra condoms. However, many sex worker can't assure the use of condoms in each sexual encounter, and almost all of them failed to know the necessity of using condom during sex with the steady non-commercial sexual partner. Barriers for FSWs to practice safe sex may reflect a lack of ability for them to assess risk and apply knowledge during sex with clients. Specific behavior change program should be set up to promote self-efficacy in FSWs and improve condom use in clients and steady non-commercial sexual partner.<sup>6</sup>

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# A Cross Sectional Study on Factors Relating to Headache Patients Presenting to a Private Hospital in Bhubaneswar

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## ABSTRACT

**Objective:** A study to describe the classification and factors related to headache patients who seek medical advice.

**Materials & Methods:** Interview of 400 consecutive patients who presented to a neurologist at a private hospital in Bhubaneswar was conducted. Demographic details, pattern of headache, associated factors and family history were recorded. International Classification of Headache Disorders version 2 was applied.

**Results:** 77% of all patients were women and 66% of them were between 20 and 60 years of age. Migraine was the most common disorder (64%) followed by tension-type headache (23.5%), medication-overuse headache (9.5%) and cluster headache (3%). Chronic daily headache was seen in 156 patients. Eleven percent of female migraineurs suffered from MRM. Study subjects with presence of factors like marriage, family history, inadequate sleep, family stress and exposure to onions had a statistically significant higher proportion than those who did not have such exposure.

**Conclusions:** Patients who seek medical advice for headache are usually in their most productive ages. Migraine and tension-type headache are the most common clinical presentations of headache. Onset of migraine is earlier in patients with first-degree family history. Menstrually related migraine affects women with headache episodes of longer duration than other patients and it warrants special therapeutic consideration.

**Keywords:** *Factors, Headache, Hospital*

## INTRODUCTION

Headache disorders have been ranked as one of the most disabling conditions in the world by World Health Organization (WHO). The prevalence of headache in the adult population worldwide is 46%<sup>1</sup>. Tension-type headache and migraine are the two most common headache disorders affecting 42% and 11% adults respectively<sup>1</sup>. About 3% of the world's population is affected by chronic headache that lasts for more than 15 days per month<sup>1</sup>. Most clinical and epidemiological studies have originated in developed countries and there is scarce literature to support treatment and public health interventions to deal with headache in low and middle income countries.

The aim of this study is to characterize patients with headache disorders in a private hospital in Bhubaneswar, Odisha who seek medical treatment.

## MATERIALS AND METHOD

A cross sectional study of patients, who presented to a neurologist at Hi Tech Medical College Hospital, Bhubaneswar, Odisha between October 2011 and March 2012, was conducted. With a prevalence of 46%, taking 5% precision with a confidence interval of 95%, the sample size was calculated as 382. To remain on the higher side a total of 420 patients were selected for the study. Out of these, 12 did not give their consent to be a part of the study and 8 of them did not fit into the International Classification of Headache Disorders. Therefore consent was obtained from 400 study subject. For each patient, a predesigned and pretested questionnaire was completed after taking proper informed consent during consultation. The questionnaire recorded demographic details, pattern of headache, associated factors and family history. The International Classification of Headache Disorders

(ICHD2) was applied and diagnoses were made according to the criteria and clinically justified.<sup>3</sup> Patients who reported a frequency of greater than or equal to 15 episodes per month were assigned the additional diagnosis of chronic daily headache (CDH)<sup>4</sup>. Body mass index (BMI) was calculated using weight and height for patients.

Statistical analysis was done by calculating percentage, confidence interval and range. Z test was

conducted to find out the significant difference of proportion and P-values less than 0.05 were considered significant.

## RESULTS

A total number of 400 patients were interviewed in the study period including 306 women and 94 men. Seventy four percent were Hindus and around 80% belonged to urban areas.

**Table 1. Distribution of headache patients according to age and sex**

Age in Years	Male		Female		Total	
	No.	%	No.	%	No.	%
<20	9	9.6	59	19.3	68	17
20 – 40	36	38.3	112	36.6	148	37
40 – 60	29	30.8	87	28.4	116	29
>60	20	21.3	48	15.7	68	17
Total	94	100	306	100	400	100
	-23.5		-76.5		-100	

Table 1 depicts that around 77% of the patients were females. Sixty six percent of patients were in the age group between 20 -60 years. The difference of proportion (76.5% in females and 23.5 % in males) presenting with headache is found to be statistically significant ( $z=14.99$  and  $p<0.0001$ ). (See table 2).

**Table 2: Distribution of Headaches by ICHD type in this study sample (n = 400).**

Type of Headache	Male		Female		Total		Z	P value (One-Tail)
	No.	%	No.	%	No.	%		
Migraine	33	35.1	223	72.9	256	64	16.79	<0.0001
Tension type headache	46	48.9	48	15.7	94	23.5	0.29	0.39
Medication overuse	10	10.6	28	9.2	38	9.5	4.13	<0.0001
Cluster	5	5.4	7	2.3	12	3	0.82	0.2
Total	94	100	306	100	400	100	14.99	<0.0001

Table 2 shows that migraine is the commonest headache disorder in our total study group (64%). Migraine is commoner than tension type headache in females (72.9% and 15.7% respectively) whereas it is just the reverse in males' i.e. 48.9% suffer from tension type headache and 35% migraine. The difference of proportion between males and females are statistically highly significant out of the total suffering from migraine and medication overuse ( $p<0.0001$ ).

Chronic daily headache was seen in 39% ( $n = 156$ ) patients. 64% of these patients were women. 57% patients with chronic daily headache had migraine, 22% had tension-type headache. Rest were diagnosed with medication-overuse headaches.

In our sample, 11% of female migraine patients suffered from Menstrually Related Migraine (MRM).

**Table 3: Distribution of headache patients according to the factors**

Factors		Percentage	95% CI (Range)	z	P value (One Tail)
Marital status	Married	78	±4.06 (73.94% to 82.06%)	15.84	<0.0001
	Unmarried	22			
Obesity	BMI>25	46.75	±4.89 (41.86% to 51.64%)	1.84	0.033
	BMI<25	53.25			
Family history	Present	56.75	±4.86 (51.89% to 61.61%)	3.82	<0.0001
	Absent	43.25			
After physical exercise	Present	21.5	±4.03 (17.47% to 25.53%)	-16.12	<0.0001
	Absent	78.5			
After inadequate sleep	Present	67	±4.61 (62.39% to 71.61%)	9.62	<0.0001
	Absent	33			
Family stress	Present	89.25	±3.04 (86.21% to 92.29%)	22.2	<0.0001
	Absent	10.75			
Exposure to onions	Present	56	±4.86 (51.14% to 60.86%)	3.39	0.0003
	Absent	44			

In Table 3 it was found out that study subjects with presence of factors like marriage, positive family history, after inadequate sleep, family stress and exposure to onions had a statistically significant higher proportion than the persons without the above factors ( $p < 0.0001$  and  $p = 0.0003$  for exposure to onions).

Body mass index (BMI) >25 did not have a statistically significant difference of proportion than that with BMI <25 ( $p = 0.033$ ).

### DISCUSSION

This is a glimpse of characteristics of headache disorders in Bhubaneswar, Odisha who were classified and diagnosed according to ICHD. Around 80% of the patients who sought treatment were between 15 and 60 years of age, the most productive age group and majority of these patients were women. Male to female ratios of 1:3 and 4:5 was reported by Jensen and Stovner for migraine and tension-type headache respectively<sup>6</sup>. A study from Pakistan reported that all types of headache are over three times more common in women<sup>6,7</sup>. In our study the ratio of male to female in migraine is 1:6 and almost 1:1 for tension type headache which is higher than the above mentioned studies.

Migraine and tension-type headache were the two most common presentations in this clinical sample. Epidemiological evidence from around the world suggests TTH is the most common cause of primary headache<sup>1</sup>. However, migraine was seen as the most common reason for presentation to the neurologist in our study. A larger study can reveal the disparity in our

study. It can also be speculated that TTH presents less frequently than migraine because of lower community prevalence. Literature reports suggest that amount of disability associated with TTH on a societal level is much higher than that with migraine especially when measured as absence from work<sup>8</sup>. Increasing awareness and improving the capability of primary care physicians to manage TTH and migraine is likely to help decrease the associated burden.

In our sample, 11% of female migraine patients suffered from menstrually related migraine (MRM). Females suffering from MRM are known to have longer lasting headache episodes with increased severity of pain<sup>9</sup>. Hence, menstrually related migraine needs to be recognized at the earliest so that prophylaxis treatment for migraine can be started soon.

Our study showed a statistically significant higher proportion of headache patients who had a positive family history. This is consistent with the findings of Rainero et al, who reported that the only significant difference was an earlier onset of disease<sup>10</sup>. It is also in accordance with a study of pediatric migraine patients which showed an earlier onset of migraine in patients with a higher familial impact than in those without a positive family history of the disease<sup>11</sup>. Migraine is a polygenic disease where several genes are responsible. Genetic predisposition when combines with environmental triggering factors causes clinical symptoms<sup>12</sup>. A new factor i.e. significant exposure to onions ( $p < 0.0003$ ) triggers headache has been reported in this study, a factor which is rarely studied and reported.

Chronic daily headache was reported by 39% of the patients in the present study. Ravi et al reported 37% patients suffered from CDH and tension-type headache was the most prevalent within this group<sup>14</sup>. In an earlier study, Chakravarty reported that almost 50% of headache clinic patients were diagnosed with CDH and 82% of them suffered from chronic migraine followed by 16% from chronic TTH<sup>15</sup>. Although 3% of world's population suffers from chronic headache, a higher figure in this study suggests that it is a neglected area in community and presents to tertiary care settings late.

### LIMITATIONS

This study characterizes patients with headache disorders who have presented to a neurologist. Therefore, it is inappropriate to generalize the results of this study to headache disorders in the community. Most patients who suffer from headaches are unaware of diagnostic and therapeutic options and therefore present late to the physicians. In addition, patients in this study had financial and physical access to an urban tertiary care hospital and they may not be entirely representative of the general population.

Nevertheless, this study highlights characteristics of headache patients who seek medical treatment and presents factors that can be modified or dealt at the earliest to prevent it to become a disabling condition. Further proper prophylaxis and specific treatment can alleviate the symptoms and a person can lead a healthy and productive life. Moreover further epidemiological evidence is required to guide public health and research policies.

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**Conflict of Interest:** None

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