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Bacteriology and Antibiotic Sensitivity Pattern of Uropathogens in Patients with Catheter Associated Urinary Tract Infections in a Tertiary Care Hospital, Bhubaneswar, Odisha

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Abstract

Background: Hospital acquired infections (HAI) serves as a significant public health problem in developing as well as in developed country. The incidence of HAIs in ICU is rising, largely because of increasing use of invasive procedures. About 25% of hospitalized patients undergo urinary catheterization hence it enhances the chances of Catheter Associated Urinary Tract Infections (CAUTI) which is difficult to cure.

The present study is designed with the aim to determine the bacterial pathogens causing Urinary tract infections (UTIs) in patients with indwelling urinary catheter and to study their antibiotic susceptibility pattern.

Methodology: This was a Cross-Sectional, hospital-based study carried out from August to September 2018 in a tertiary care hospital in Eastern India. A convenient sample size of 50 Catheterized patients admitted to the hospital from whom urine samples were collected. Fifty urine samples were also collected from non-catheterized patients as control group. Informed written consent was taken from patients before collecting the urine sample. Data was entered and analyzed on Statistical Package of Social Sciences (SPSS) Version 12. Mean and Standard deviation was calculated for quantitative data and proportions were calculated for qualitative data.

Results: The age of the patients ranged from 15 to 90 years with a mean of 50.49 years. Majority (62%) were in 46-75 years age group and were males (68%). The rate of developing UTI was more with increase in duration of catheterization and it was 86% with 8-14 days of catheterization. Among catheterized patients *Escherichia coli* was found to be the most frequently isolated pathogen 23(36.5%) followed by *Klebsiella pneumoniae* 12 (19%) and *Enterococcus species* 8(12.7%). Among the 31 positive samples, 10 samples showed growth of 2 organisms and 6 samples showed growth of 3 organisms.

Conclusion: Reduction of Hospital acquired infections and antibiotic resistance is both a challenge and goal of all health care centers around the globe. To lower our economic burden and improve the healthcare standards of the catheterized patient admitted to the hospital we have to broaden our knowledge regarding safe use of indwelling urinary devices.

Key words: CAUTI, UTI, Bacteriology, Antibiotic Sensitivity, *Escherichia coli*, *Klebsiella pneumoniae*

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Introduction

Urinary Tract Infection (UTI) is the most common nosocomial infection among hospitalized patients and one of the most important causes of morbidity in the general population. It is caused by the microbial

invasion of the genitourinary tract that extends from the renal cortex of kidney to the urethral meatus. Hospital acquired infections (HAI) serves as a significant public health problem in developing as well as in developed country. The incidence of HAIs in ICU is rising, largely because of increasing use of invasive procedures. About 25% of hospitalized patients undergo urinary catheterization hence it enhances the chances of CAUTIs which is difficult to cure.

Approximately 35% of all Hospital Acquired Infections (HAIs) are contributed by UTIs. Instrumentation of urinary tract, mainly catheterization leads to 66-86% of the infections. The method of insertion, quality of the catheter used, duration of catheterization and host susceptibility also plays a major role in acquiring these infections.

Catheter associated urinary tract infection (CAUTI) is defined by the Center for Disease Control and Prevention (CDC) as "Any urinary tract infection in a patient who had an indwelling catheter in place at the time of or within 48 hours prior to onset of infection". There has not been any minimum period defined for the catheter to be in place for the urinary tract infection to be categorized as CAUTI. CAUTIs may range from asymptomatic bacteremia to symptomatic urinary tract infection. Hospital acquired CAUTIs are mostly due to Multidrug Resistant Strains of the uropathogens, which require higher antibiotics and also these strains may spread to other patients.

Urinary catheters are standard prosthetic medical devices used in managing bladder dysfunction, but unfortunately provides attractive surface for colonization. Majority of uropathogens are faecal contaminants or normal skin flora from the patients periurethral area. For catheter associated infections organisms ascend from urethral meatus along the catheter urethral interface preferably by extra luminal (66%) route. In 34% cases organisms can enter bladder by intraluminal route where they migrate as a result of manipulation of catheter system.

The bacterial pathogens commonly isolated from the catheters are *Escherichia coli*, *Proteus mirabilis*, *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, *Staphylococcus epidermidis* and *Enterococcus faecalis*. These bacterial pathogens may originate endogenously

or exogenously. Microorganisms which are fully sensitive to antibiotics may become fully resistant in the biofilm mode.

The present study is designed with the aim to determine the bacterial pathogens causing Urinary tract infections (UTIs) in patients with indwelling Urinary Catheter and to study their antibiotic Susceptibility Pattern. This will help and guide the clinicians to make a precise decision regarding treatment and management of such infections.

Materials and Methods

This was a Cross-Sectional, hospital-based study carried out from August to September 2018. A

convenient sample size of 50 Catheterized patients admitted to the hospital from whom urine samples was collected. 50 urine samples were also collected from non-catheterized patients as control group. Informed written Consent was taken from patients before collecting the urine sample.

Selection Criteria were as follows:

Inclusion criteria-

For Cases

1. All ages groups, both sexes, who were on indwelling urinary catheter for at least 2 days.
2. Patients who were suffering from symptoms of UTIs (fever $>38^{\circ}\text{C}$, urgency, frequency, dysuria or suprapubic tenderness)

For Controls

1. Urine samples from non-catheterized patients with symptoms of UTIs were included.

Exclusion Criteria

1. Patients with symptoms of UTI prior to catheterization
2. Patients who didn't give consent

Detailed information for each patient was entered in the study proforma.

Sample collection-

After taking approval from the Institutional Research and Ethical Committee and taking written Informed Consent with explaining the detailed procedure and rationale of the study, the samples were collected. Prior to catheter change or removal from each patient, about 10ml of urine was obtained from the distal edge of the catheter tube aseptically using a sterile needle and syringe transferred into sterile universal container. Clean catch mid-stream (CCMS) urine samples from non-catheterized patients were taken in case of control group. Samples were transported to the laboratory with minimum delay. Urine samples were inoculated on Cystine Lactose Electrolyte Deficient (CLED) medium with calibrated loops to determine the Colony Forming Units (CFU) and were incubated aerobically at 37°C for 24 hours. A specimen was considered positive, if a single / two potential pathogens were cultured at a concentration of $\geq 10^5$ Colony forming unit (CFU)/ml from CCMS urine or catheterized urine or $\geq 10^3$ CFU/ml of single potential pathogen from catheterized urine specimens.

After 24 hours of incubation, the plates were observed for bacterial growth. Colonies were examined and the identification of the isolated bacteria was made up to Species level on the basis of colony morphology, gram stain, motility & biochemical tests following conventional microbiological techniques. Isolates showing fungal growth were further cultured in Sabouraud's Dextrose Agar and further identification was done by Germ Tube Test.

Bacterial susceptibility to antimicrobial agents was determined by the Kirby Bauer disk diffusion method on Muller-Hinton agar using antibiotic discs procured from Hi Media (Mumbai, India). Isolates were categorized as susceptible, moderately susceptible, and resistant, based upon interpretive criteria developed by the Clinical and Laboratory Standards Institute (CLSI).

The antibiotics used for Gram negative organisms were □ampicillin(10µg), amikacin (30 µg), gentamicin (10µg), ceftriaxone (30µg), cefepime (30 µg), cefoperazone (75µg), cefoperazone -sulbactam(75/75 µg), levofloxacin (5µg), imipenem (10 µg), piperacillin - tazobactam(100/10µg), ceftazidime (30 µg), ertapenem(10µg), meropenem(10µg), amoxicillin-clavulanic acid (20/10 µg), and nitrofurantoin(300µg),

aztreonam(30 µg), cefuroxime(30µg),ticarcillin-clavulanic acid (75/10µg), ampicillin(10µg), tigecycline(15µg), ciprofloxacin(5µg) & cotrimoxazole(1.25/23.75µg).

The antibiotics used for Gram positive Organisms- levofloxacin 5µg), nitrofurantoin(300µg), vancomycin(30µg), cotrimoxazole (1.25/23.75µg), ciprofloxacin(5µg), erythromycin(15µg), linezolid (30µg), colistin(10µg), teicoplanin(30µg), clindamycin (15µg), ampicillin (10µg) and tigecycline(15µg).

Statistical Analysis

Data was entered and analyzed on Statistical Package of Social Sciences (SPSS) Version 12. Mean and Standard deviation was calculated for quantitative data and proportion was calculated for qualitative data.

Results

In this hospital based observational study carried out in a tertiary level teaching hospital of eastern India, 50 catheterized patients were included. The age of the patients ranged from 15 to 90 years with a mean of 50.49 years. Majority (62%) were in 46-75 years age group. Around one fifth were in younger age group of 15-30 years. (TABLE 1).

Three fourths (75%) of the samples were culture positive in 61-75 years age group followed by 67% in 46-60 years age group. Overall, culture positivity was found in 62% of urine samples. Out of 50 patients, majority were Males -34 (68%) and only 16(32%) were females. Culture positivity was also seen more in males 22(64.7%) as compared to females 9 (56.25%). (TABLE 2).

The rate of developing UTI was more with increase in duration of catheterization and it was 86% with 8-14 days of catheterization. (TABLE 3).

Among catheterized patients *Escherichia coli* was found to be the most frequently isolated pathogen in 23 (36.5%) followed by *Klebsiella pneumonia* in 12 (19%) and *Enterococcus species* in 8(12.7%) samples. Among the 31 positive samples, 10 samples showed growth of 2 organisms and 6 samples showed growth of 3 organisms. However, among the non-catheterized patients, *Escherichia coli* 12(34.3%), *Klebsiella*

pneumoniae 7(20%) and *Staphylococcus species* 5(14.4%) were the commonest isolates. *Candida species* 2(3.2%) and *cryptococcus laurentii* 1(1.5%) were also isolated from the catheterized patients in addition to the bacterial pathogens. (TABLE 4). Maximum number of patients on catheter showing culture positivity where from ICU 26(52%) followed by Medicine Ward 11(22%) and Surgery Ward 8(16%). Among the study population, Hypertension (54%) and Diabetes Mellitus (44%) were the common underlying illnesses followed by cerebrovascular accidents (28%) and Chronic Kidney Disease in 20%.

The in vitro antibiotic susceptibility pattern of the gram-negative pathogens showed high resistance to commonly used antibiotics such as Ampicillin (100%), Cefuroxime (100%) Cefoperazone-Sulbactam

(85%), and Piperacillin/Tazobactam (83%).

Klebsiella, *Proteus*, *Pseudomonas* and *Serratia* species were found to be the most resistant bacterial pathogens to majority of the antibiotics. Maximum susceptibility of the gram-negative isolates was observed for colistin (69%), cotrimoxazole (55%) and amikacin (50%). *Staphylococcus* species showed 100% susceptibility for Teicoplanin, Vancomycin, Tigecycline, Nitrofurantoin and Cotrimoxazole. Only a single staphylococcal isolate was susceptible for linezolid. All the *staphylococcal* isolates were resistant to Ampicillin, erythromycin, clindamycin and fluoroquinolones. *Enterococcus* species were maximum susceptible to Teicoplanin, Vancomycin and Tigecycline (87.5% each) and highest resistance was seen for Clindamycin and Erythromycin.

TABLE 1: AGE WISE DISTRIBUTION OF PATIENTS INVESTIGATED FOR CAUTI (n=50)

AGE GROUP (in Yrs.)	NUMBER (%)	CULTURE POSITIVITY n (%)
15-30	11(22.0)	6(54.0)
31-45	6(12.0)	2(33.0)
46-60	15(30.0)	10(67.0)
61-75	16(32.0)	12(75.0)
76-90	2(4.0)	1(50.0)
TOTAL	50(100%)	31(62%)

TABLE 2: GENDER WISE DISTRIBUTION OF PATIENTS INVESTIGATED FOR CAUTI (n=50)

GENDER	NUMBER (%)	CULTURE POSITIVITY n (%)
MALE	34(68.0)	22(64.7)
FEMALE	16(32.0)	9(56.25)
TOTAL	50(100%)	31(62%)

TABLE 3: LENGTH OF CATHETERIZATION IN RELATION TO DEVELOPMENT OF SIGNIFICANT BACTERIURIA (n=50)

DURATION (in days)	NUMBER OF SAMPLES n (%)	SIGNIFICANT BACTERIURIA n (%)
2-7	19(38.0)	5(26.0)
8-14	23(46.0)	20(86.0)
>14	8(16.0)	6(75.0)
TOTAL	50(100%)	31(62%)

TABLE 4: DISTRIBUTION OF UROPATHOGENS FROM URINE SAMPLES

ORGANISMS	CATHETERIZED (n=50)	NON-CATHETERIZED (n=50)
	Number (%)	Number (%)
Escherichia coli	23(36.5)	12(34.3)
Klebsiella pneumoniae	13(20.6)	7(20.0)
Enterococcus species	7(11.1)	4(11.5)
Pseudomonas aeruginosa	6(9.5)	1(2.8)
Acinetobacter baumannii	5(8.0)	2(5.7)
Proteus mirabilis	2(3.2)	1(2.8)
Serratia species	2(3.2)	0
Staphylococcus species	2(3.2)	5(14.4)
Enterobacter	0	1(2.8)
Citrobacter species	0	2(5.7)
Candida species	2(3.2)	0
Cryptococcus laurentii	1(1.5)	0
TOTAL	63 (100%)	35(100%)

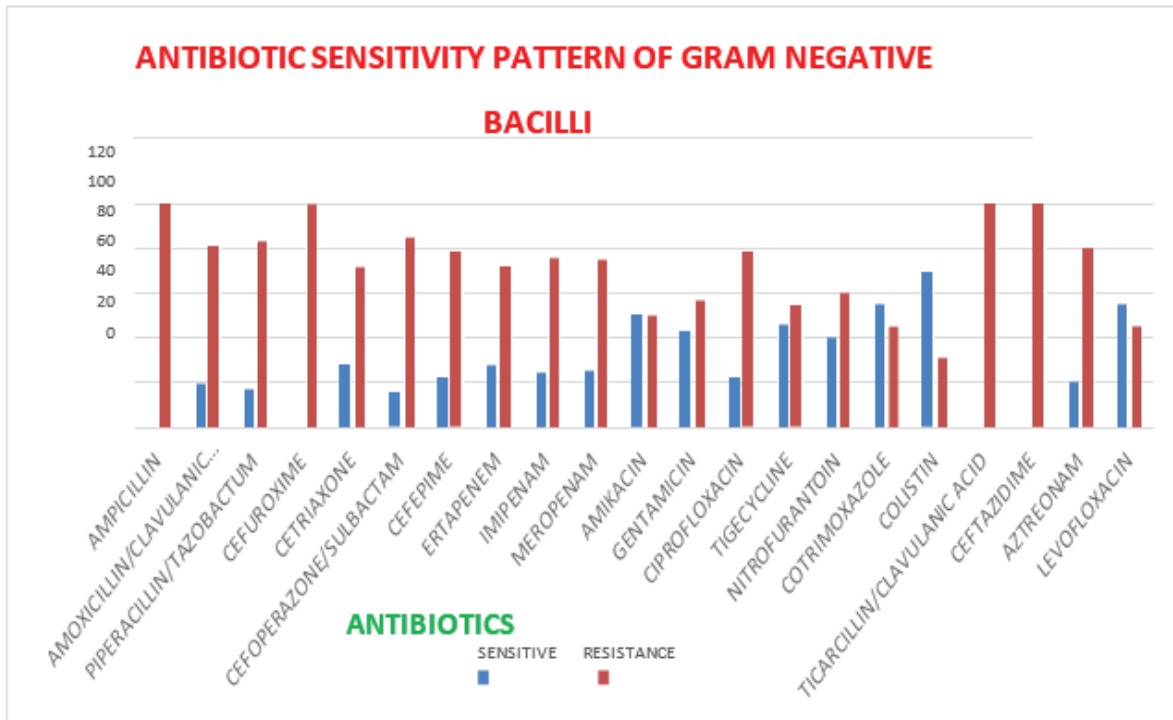


Figure 1: Antibiotic Sensitive and Resistance Pattern of Gram-Negative Bacterial Isolates

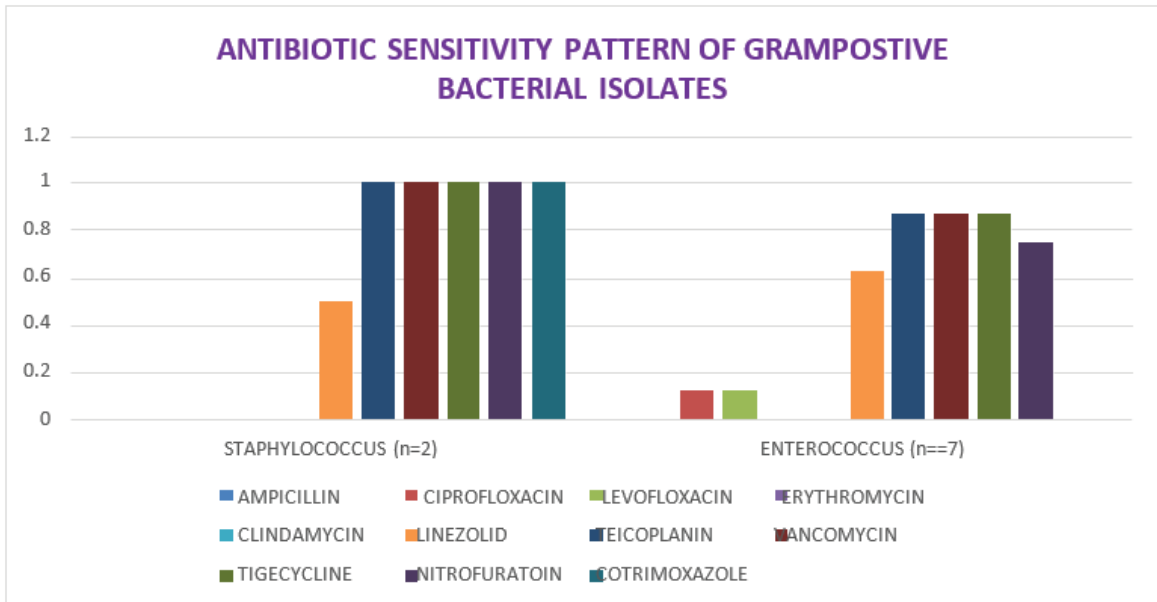


Figure 2: Antibiotic Sensitivity Pattern of Gram-Positive Bacterial Isolates

Discussion

More number of CAUTIs occur due to increased use of urinary catheters which are the second most used foreign body in the patients. Despite good aseptic precautions, more than half of the patients develop bacteriuria during first 10-14 days of catheterization. Monitoring of the Antimicrobial therapy is important as they are becoming resistant to common antibiotics.

The present study was conducted on 50 catheterized patients admitted to our hospital which a tertiary health care center. Out of the 50 patients, who were on indwelling catheters, 31(62%) had significant bacteriuria. This finding is close to the observations of Anthony et al (60.9%), Patil et al (76%) and Tomar et al (74%). But, Tawo S Set al and Majumder et al have seen 88.5% and 90% culture positive cases among their study population.

In our study, the age group 61-75 years predominated and it represented 32% of the total study population, followed by 46-60 years (30%). Culture positivity was also seen maximum in the age group of 61-75 years which can be correlated with the findings of Sayal P et al (46.25%), Niveditha S et al (36%) Leelakrishna P et al (35.2%) who have also seen maximum number of CAUTI cases in the age group more than 60 years.

Occurrence of CAUTI was more in male patients in our study than that of female patients. Out of 34 males, 22 (64%) showed culture positivity whereas 9 (56%) females showed culture positivity out of 16. This finding is comparable with the studies having similar male predominance like Kulkarni et al (68.18%) , N Bhatia et al and Jaggi N et al . However, Setu K S et al have seen female (61.68%) predominance of CAUTI cases in their study as compared to males.(38.2%). Maximum number of samples were collected from males as compared to females in our study & males are more prone to Obstructive Urinary Lesion especially Benign Hypertrophy of Prostate, Carcinoma prostate and stricture associated with advanced age.

In the present study, rate of developing UTI was more with increase in duration of catheterization and it was 86% with 8-14 days of catheterization. Similar findings were also shown by Tomar R et al (87.5%) , Kulkarni SG et al (65%) and Majumdar et al. (71%) . In our study *Escherichia coli* was the most frequently

isolated bacterial pathogen 23(36.5%) followed by *Klebsiella* species 13(19%), *Enterococcus* species 7 (12.7%) and *Pseudomonas aeruginosa* 6 (9.5%) among the catheterized patients. This finding is also consistent with other studies by Tomar R et al , Kulkarni SG et al and Niveditha S et al.

Klebsiella was the 2nd most common organism associated with CAUTI in our study, similar to studies carried out by Kulkarni S G et al and N Bhatia et al .The emergence of *Candida* species infection (3.2%) in our study is also comparable to other studies such as the study done by Nandini et al (3.84%) , Vinoth et al (4%) and Taiwo et al (3.2%) .

Among the Non-Catheterized patients *Escherichia coli* was also the commonest bacterial pathogen isolated 12(34%). Sayal et al had also similar observations among the Non- catheterized patients (45%). Findings of Abdallah et al also correlates with our study that *Escherichia coli* was the most common pathogen isolated in both catheterized and non-catheterized patients.

Enterobacteriaceae have several virulence factors responsible for their adherence to the uroepithelium. These gram-negative aerobic bacteria colonize the urogenital mucosa with pili, adhesions, fimbriae (Type 1 fimbriae) and P1 blood group phenotype receptor which makes it the most common cause of UTIs and CAUTIs.

Maximum Culture Positive cases were seen from ICU 26(52%) in our study followed by the samples collected from Medicine ward 11(22%) and Surgery ward 8(16%). As most of the patients in ICU were critically ill and duration of their stay was longer as compared to those staying in the ward, probability of getting culture positivity was maximum among them. Studies carried out by Vinoth M et al have shown maximum number of CAUTI cases among patients from Surgical Ward (58%). Such Area-Specific Monitoring Studies will help to choose the correct empirical treatment by knowing the pathogens responsible for UTIs.

Common underlying illnesses in our study among the catheterized patients were Hypertension (54%) and diabetes mellitus (44%). Hypertension and Diabetes Mellitus both can lead to number of complications leading to hospitalization and subsequently predisposing the patients for acquiring UTI by catheter insertion.

Similar observations were also documented by Niveditha S et al, Sayal P et al and Kulkarni S et al.

The in vitro antibiotic Susceptibility pattern of the Gram-Negative Organisms showed high resistance to commonly used antibiotics like Ampicillin (100%), cefuroxime (100%) Cefoperazone-Sulbactam (85%), and Piperacillin/Tazobactam (83%) and good sensitivity to Colistin (69%), cotrimoxazole (55%) and amikacin (50%). Similar results were documented by Taiwo S et al, Kulkarni SG et al and Garg et al.

Sensitivity pattern of *Escherichia coli*, which is the commonest bacterial pathogen isolated from catheterized patients was 100% sensitive to colistin and tigecycline followed by nitrofurantoin (78%) Amikacin (73.9%) and Imipenem (52.1%). All the *Escherichia coli* were resistant to ampicillin and cefuroxime and was less sensitive to ceftriaxone (13%) and Ciprofloxacin. (17.3%). These observations were similar to findings of Ponnusamy P et al & contrary to the study done by Das R N et al which shows high sensitivity to Ampicillin.

Klebsiella was resistant to most of the antibiotics and was only sensitive to few like Colistin (92.3%), tigecycline (53.8%), imipenem (38.4%), Nitrofurantoin (30.7%) & Amikacin (23%). Similar results were seen by Kulkarni SG et al.

Staphylococcus species showed 100% susceptibility for Teicoplanin, Vancomycin, Tigecycline, Nitrofurantoin and Cotrimoxazole. Only a single staphylococcal isolate was susceptible for linezolid. All the staphylococcal isolates were resistant to ampicillin, erythromycin, clindamycin and fluoroquinolones. *Enterococcus* species were maximum susceptible to Teicoplanin, Vancomycin and Tigecycline (87.5%) and highest resistance was seen for Clindamycin and Erythromycin (0%). Study conducted by Tomar R et al and Garg N et al also showed similar results.

This universal resistance of biofilm cells to antimicrobial agents is very important clinically and has to be considered when initiating antibiotic therapy. Hence there is a need to establish standard guidelines for care of catheter, newer protocols should be developed for maintain long duration of catheters and development of antimicrobial urinary catheters is needed.

Conclusion

The Urinary tract of catheterized patients is highly vulnerable to severe infections. In our study, *Escherichia coli* was the most important pathogen isolated from the UTIs in catheterized patients (34%). Incidence of CAUTIs increases due to longer duration of catheterization.

In this study, Gram Negative Organisms were highly sensitive for colistin (69%), cotrimoxazole (55%) and amikacin (50%) whereas Gram positive organisms were highly sensitive to Teicoplanin (93.75%), Vancomycin (93.75%), Tigecycline (93.75%). Probably microbial biofilms have been integrated with variety of persistent infections which respond dreadfully to the conventional antibiotic therapy and it helps in transfer of antibiotic resistance traits in the nosocomial pathogens by enhancing the mutation rates and by the changing of genes which are responsible for antibiotic resistance.

Reduction of Hospital Acquired and antibiotic resistance is both a challenge and goal of all health care centers around the globe. To lower our economic burden and improve the healthcare standards of the catheterized patient admitted to the hospital we have to broaden our knowledge regarding safe use of indwelling urinary devices.

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Conflict of Interests- None

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Ethical Considerations- Approval for the study was taken from the Institutional ethical committee.

The informed written consent was taken from the patients prior to the study either in English or local language. The privacy and confidentiality of the patients were maintained.

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To Evaluate and Compare the Effect of Commercially Available Model Hardening Agent on Surface Hardness and Surface Roughness of Refractory Investment Materials: An In-Vitro Study

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Abstract

Background: Various studies are conducted to evaluate the effect of hardening agent on surface hardness of refractory investment material but these studies do not evaluate the amount of load and depth at which maximum hardness is anticipated. So, the present study was conducted to evaluate the effect of hardening agent on the surface hardness of dental refractory investment material when treated with hardening agent at varying degree of load and depth. **Materials and methods:** The commercially available phosphate-bonded refractory investment material (Adentatec-Vest PA, Adentatec GmbH, Germany) and hardening agent (Kalthärter cold hardener, Dentaurum GmbH & Co. Deutschland) were used in this study. The specimens were fabricated and divided into two groups: **Group A:** specimen without hardening treatment; **Group B:** specimen with hardening treatment. Surface hardness test was performed with the use of a nanoindenter (NT Berkovich indenter); while surface roughness test was measured with Surfcom-130A using an electrically operated stylus arm. The data were tabulated and analyzed using t-test for both the surface hardness and surface roughness parameters with p -value < 0.05 was considered significant. **Results:** Both surface roughness ($p=0.043$) and surface hardness ($p=0.017$) of group A and group B specimens were comparable and have shown with significant difference. **Conclusion:** The hardening treatment is effective on decreasing surface roughness and improving surface hardness of phosphate-bonded refractory investment material.

Keywords: model hardening agent, surface hardness, surface roughness, refractory investment materials.

Introduction

Refractory investment is an investment material that can withstand the high temperatures used in soldering or casting¹. It must be able to reproduce surface details of

master cast, must have exceptional surface hardness and must be more resistant to surface abrasion when working with wax pattern on the refractory cast².

Phosphate-bonded investments are similar with gypsum-bonded investment; they consist of silica and binder such as magnesium oxide and phosphate to provide high thermal expansion. Mixing of colloidal silica and water will form magnesium ammonium phosphate ($Mg \cdot NH_4 \cdot PO_4 \cdot 6H_2O$), which increases the setting expansion and strengthens the set material^{3,4}. However, they provide drawbacks of a low abrasion

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resistance and reduced surface hardness which are difficult to preserve surface detail of the refractory cast model while wax pattern fabrication^{5,6}.

Hence, to achieve the more desirable properties of surface roughness and surface hardness, refractory investment materials are commonly treated with surface hardening agent, surface coatings or various specific surface treatments. Several reports have been published regarding cast hardening agent that has significantly changed the mechanical and physical properties of various dental investment materials⁷⁻¹¹. Another recent study conducted by Saji et al², application of different hardening agents on two commercially available refractory materials. Surface abrasion, surface hardness and surface detail reproduction were evaluated under appropriate tools and devices. Result showed that hardening agents do improve the surface abrasion resistance and abrasion values of the treated samples, but these agents would mask the surface reproduction of the duplicated refractory model.

Therefore, the present study aims to evaluate and compare the surface hardness and surface roughness of refractory investment material, when treated with hardening solution. It is hypothesized that treated samples would not mask the surface reproduction details of the model and the same time would provide the exceptional surface hardness.

Materials and Methods

This study was conducted in AIMST Dental Centre, AIMST University and Universiti Sains Malaysia, Nibong Tebal, Malaysia after the consent is obtained from the ethical committee.

Procedures of preparing samples

An acrylic round block with the measurement of 30 mm diameter and 12 mm height (**Figure 1**) was prepared using heat cure acrylic material (Kemdent, Kemdent works, Wiltshire, UK). The silicone mold was prepared by using acrylic block with the help of silicone duplicating material (Metrosil, Metrodent Ltd. Huddersfield, England). Two specimens of refractory investment materials were prepared and divided into groups; **group A**: specimen without hardening treatment, and **group B**: specimen after treatment with

hardening agent.

The water-powder ratio of the refractory phosphate bonded investment material was mixed according to the manufacturer's instructions. Then, the resulting powder and liquid mixture were poured into a mixing flask with 10 seconds of hand spatulation and 60 seconds of vacuum-mixing process. The mixture was then poured into the silicone mold using a vibrator to prevent trapping of air bubbles. After 60 minutes, both the specimens were removed from the silicone mold (**Figure 1**). Group B specimen was placed in a 4055 model drying oven (CMP Industries, Albany, New York, USA) and heated to 220°C for 40 minutes as recommended by the manufacturer's user manual. It was then dipped into Kalthärter cold model hardening agent for 5 seconds and was placed back in drying oven for 5 minutes as a final drying process.

Testing for surface roughness and surface hardness

Specimens of groups A and B (**Figure 2**) were kept at room temperature for two weeks to ensure complete dryness of the sample⁸ and later on, these specimens were tested using Surfcom-130A and Nanoindenter for surface roughness and surface hardness respectively. The specimens were first tested on Surfcom-130A to evaluate their surface roughness. Three randomly selected locations on the specimen surface were electrically operated by a stylus arm to record a desired roughness profile for final measurement of roughness values (R_a in μm). R_a is defined as the arithmetic average of the profile ordinates within the measured section. This can also be called the average height¹².

The stylus tip made of diamond with $2\mu\text{m}/60^\circ$ with resolution up to $0.001\mu\text{m}$ was used to evaluate the vertical deviations from nominal surface over a specified length surface of the specimens. A measuring force of 0.75mN was kept constant throughout the operations (DT04800-R001, Tokyo Seimitsu Co. Ltd., Tokyo, Japan). The operated specimens were carefully removed from the machine and the desired data of each location in both groups were recorded in a printout using a high-resolution thermal-printer. The roughness value was calculated and analyzed using SPSS software.

Surface hardness of groups A and B specimens were measured under a Nanoindenter. Both specimens were placed on the travelling stage of a nano-indentation system (Nanotest Vantage, Micro materials, UK). A NT Berkovich indenter with three-sided pyramid and a total included angle of 142.3 degrees and a half angle of 65.27 degrees was employed in the system. Again, three randomly selected locations on the specimen surface were marked as indenting position. The Berkovich indenter was positioned to the starting spot by the program and applied with a constant force of 5mN (0.5g) and progressively increased up to 500mN (50g). The dwell period and loading rate of the indenter was set to 30s and 16mN/s as recommended by the manufacturer’s user manual¹³.

A total of 10 indentations were measured until a maximum loading force of 500mN (50g). Upon completion of measuring the 10 indentations in that

particular location, the Berkovich indenter was moved to the next pre-marked location until all locations were measured. In the end, all values were recorded into the system and further calculated and analyzed using SPSS software.

Results

The surface roughness for specimens of group A and B were tested and tabulated at three different locations (X, Y, Z) using surfcom-130A as shown in table 1. The surface hardness for specimens of group A and B were tested and tabulated at three different locations using nanoindenter as shown in table 2, 3. A student t-test was used to measure the difference between group A and group B specimens for surface roughness and surface hardness as shown in table 4. Analysis showed that there was a significant difference in the surface roughness ($p=0.043$) and surface hardness ($p=0.017$) in the specimens of group A and B (t-value 2.776).

Table 1: Roughness analysis at location X, Y and Z of group A and B specimens

Surface roughness	Group A specimen			Group B specimen		
	Ra (µm)	Rq (µm)	Rz (µm)	Ra (µm)	Rq (µm)	Rz (µm)
Location X	2.774	3.386	15.022	1.922	2.396	12.045
Location Y	2.501	3.210	16.225	1.619	2.024	10.75
Location Z	2.196	2.742	12.488	2.065	2.668	14.637

Table 2: Hardness analysis at location X, Y and Z of Group A specimen

Indent	Location	Max Depth (nm)	Plastic depth (nm)	Max Load (mN)	Hardness (Gpa)
1	X	788.53	721.79	5.00	0.39
	Y	914.42	858.15	5.00	0.27
	Z	1990.65	1930.65	5.00	0.05
2	X	1994.72	1803.17	60.00	0.75
	Y	3010.30	2868.38	60.00	0.29
	Z	3981.38	3831.20	60.00	0.16
3	X	2934.78	2560.49	115.00	0.71
	Y	4181.99	3987.03	115.00	0.29

Cont... Table 2: Hardness analysis at location X, Y and Z of Group A specimen

	Z	3825.13	3632.51	115.00	0.35
4	X	4194.17	3883.65	170.00	0.46
	Y	3915.62	3651.61	170.00	0.52
	Z	4452.66	4167.32	170.00	0.39
5	X	4955.38	4603.98	225.00	0.43
	Y	4627.71	4325.16	225.00	0.49
	Z	4938.20	4566.79	225.00	0.44
6	X	5836.15	5318.32	280.00	0.40
	Y	4473.42	4101.01	280.00	0.67
	Z	4928.26	4560.63	280.00	0.76
7	X	6441.42	6044.34	335.00	0.37
	Y	4981.77	4497.39	335.00	0.67
	Z	6691.90	6320.30	335.00	0.34
8	X	6475.02	6073.44	390.00	0.43
	Y	9354.73	8810.17	390.00	0.20
	Z	4952.00	4567.07	390.00	0.54
9	X	8891.33	8422.47	445.00	0.25
	Y	7190.09	6701.83	445.00	0.40
	Z	8132.70	7672.55	445.00	0.30
10	X	10499.25	9977.11	500.00	0.20
	Y	7176.70	6629.55	500.00	0.46
	Z	8859.76	8308.31	500.00	0.29

Table 3: Hardness analysis at location X, Y and Z of Group B specimen

Indent	Location	Max Depth (nm)	Plastic depth (nm)	Max Load (mN)	Hardness (Gpa)
1	X	961.22	899.17	5.00	0.25
	Y	2815.56	2760.92	5.00	0.02
	Z	1161.58	1124.40	5.00	0.02
2	X	1848.17	1713.75	60.00	0.83
	Y	2370.24	2249.27	60.00	0.48
	Z	5927.22	5784.03	60.00	0.49
3	X	3497.67	3292.88	115.00	0.43
	Y	3187.13	2955.02	115.00	0.53
	Z	7558.70	7353.56	115.00	0.55
4	X	6346.83	6091.05	170.00	0.18
	Y	6933.98	6718.41	170.00	0.15

Cont... Table 3: Hardness analysis at location X, Y and Z of Group B specimen

	Z	6649.18	6377.90	170.00	0.16
5	X	6109.33	5860.04	225.00	0.26
	Y	8334.63	8061.52	225.00	0.14
	Z	7623.84	7335.24	225.00	0.13
6	X	7025.30	6710.23	280.00	0.25
	Y	3812.51	3484.72	280.00	0.94
	Z	8220.68	7917.50	280.00	0.91
7	X	11011.67	10652.66	335.00	0.12
	Y	6876.72	6482.55	335.00	0.32
	Z	11639.63	11290.40	335.00	0.83
8	X	9567.52	9223.18	390.00	0.18
	Y	7519.71	7162.16	390.00	0.31
	Z	13251.33	12887.24	390.00	0.71
9	X	8468.68	8106.33	445.00	0.27
	Y	9737.03	9391.59	445.00	0.20
	Z	11875.45	11493.15	445.00	0.60
10	X	10784.00	10412.76	500.00	0.18
	Y	8838.03	8436.96	500.00	0.28
	Z	13193.34	12715.27	500.0	0.38

Table 4: Surface roughness and surface hardness description of group A and B specimens

Variables	Surface roughness		Surface hardness	
	Group A (in μm)	Group B (in μm)	Group A (in GPa)	Group B (in GPa)
Location X	2.77	1.92	0.75	0.83
Location Y	2.50	1.61	0.68	0.94
Location Z	2.19	2.06	0.76	0.91
Mean	2.49	1.86	0.732	0.896
Standard Deviation	0.289	0.228	0.046	0.055
p-value	0.043 (<0.05)		0.017 (<0.05)	

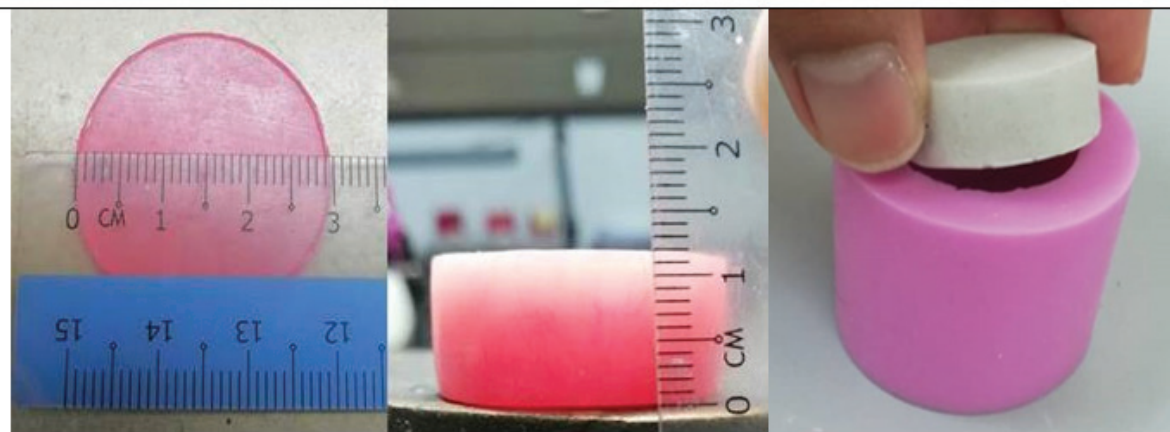


Figure 1: Acrylic round block fabrication and sample removal from silicone mold

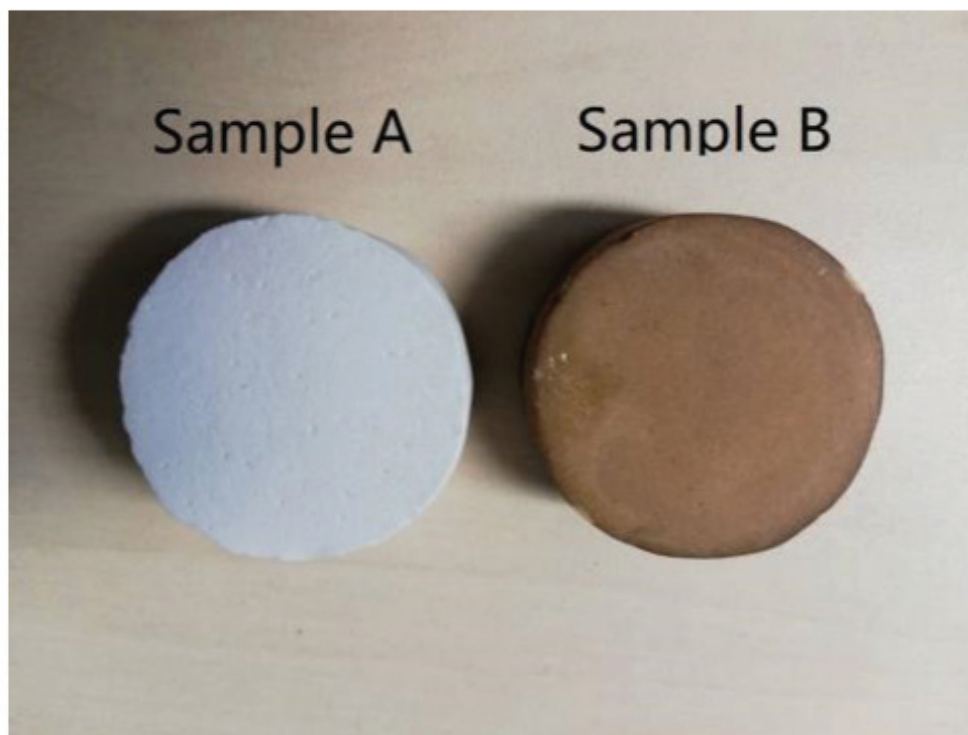


Figure 2: Specimens of group A and group B are kept at room temperature

Discussion

Phosphate bonded refractory investment material was used to test the surface hardness and surface roughness in this study. Due to high brittleness and low abrasion resistance of the material, the surface of the samples were protected with soft material during the preparation^{2,14-15} and stored at room temperature to

avoid alteration of material properties.¹⁶ Hardness can be affected by a high drying temperature, long drying period or a hardener with an overdue shelf-life.

The present study investigated surface roughness of refractory investment materials and showed that samples treated with hardening agent have lower surface roughness. The hardening agent is found to be

significantly effective on improving surface roughness of cast refractory investment materials. This result can be explained by the findings from Sanad et al, in which a dental hardener (sulfonated fatty acid), can react with calcium sulphate to form the calcium salt of the fatty acid. The particles of this salt can block or partially block and penetrate and fill the superficial pores of the investment material.²⁰

Lindquist et al measured three different commercial products of type IV and one commercial product of type V gypsum material with application of two different surface die hardeners. The abrasion resistance was evaluated using the application of stylus on abrasion device to each group of specimens. Singh NSK et al used a similar method with Linquist et al by using stylus-based abrasion device but with three different products of type IV gypsum material and two different brands of hardening agent. They have concluded that abrasion resistance would vary with different applications of dental hardeners.^{7,11}

The present study has shown that model hardening agent has effective role in providing surface hardness which is statistically significant. Saji P et al conducted a study, in which the hardness value of Mohs' scale of treated sample was higher when compared to untreated samples.² However, Mohs' scales which do not give a linear result can lead to technical weakness, hence indentation hardness tests such as nanoindentation were developed for improvement of accuracy and consistency²¹⁻²², as employed in this study. From the study of Harris et al⁶, the micro-hardness of type III and type IV gypsum material does not vary with each other with the use of cyanoacrylate die hardener, but observed with reduction of surface hardness. Therefore, they concluded that hardeners do not give influence on gypsum material instead it leads to reduction in hardness of gypsum investment, which contradicts the result of our present study. However, Khan et al⁸ show that cyanoacrylate increases the surface coating on type IV gypsum material and improves the surface abrasion resistant. Hence, they claimed that cyanoacrylate is suitable to be used as hardening application, which is in accordance with the result of our present study.

Conclusion

Based on the result analysis, there is a significant

difference for both surface roughness and surface hardness when treated with model hardening agent. Hence it can be concluded that model hardening agent is significantly effective on decreasing surface roughness and improving surface hardness of phosphate-bonded refractory investment material and it should be used meticulously to achieve the successful restoration.

Conflict of Interest: Nil

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Free Radicals and Oxidative Stress: The Role of Mitochondria in Aging and Mortality

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Abstract

Free radicals are important in living systems and the antioxidant defense system is required to regulate and balance them to maintain the life of the organism. Oxygen toxicity is one of the most important reasons of diseases and aging. The key to longer life span of an organism lies with reduction of formation of oxyradicals. We propose that mitochondria being the site of free radical production and control during cellular respiration, are the main organelle responsible for aging. We also discuss the possibility of upregulation of apoptosis by the mitochondrial route by which one can indefinitely prolong the life of a cell and hence of an organism.

Keywords: Free radicals, Antioxidant defense system, aging, mitochondria, oxyradicals

Introduction

A radical is an atom or a molecule or a compound having an unpaired electron. The outer most electrons of oxygen are having parallel spins, hence they are not paired. Fundamentally this becomes the reason of oxygen toxicity. During aerobic respiration 80-95% oxygen consumed by the organism gets reduced to water when it passes through electron transport chain of the mitochondria. However, about 3-5% of oxygen is leaked from the cycle^[1]. Oxygen is essential for life and living, but nevertheless it is critical to learn why it is a double edged sword to have unavoidable significant toxicity. Since they have unpaired electrons, they are electron-loving and choose sites of electron density to attack. They attack proteins, amino acids, DNA, RNA (Electron density is high in nitrogenous compounds), polyunsaturated fatty acids and phospholipids (carbon-carbon double bonds). Because of having unpaired electrons they are extremely reactive. In the living system radicals derived from oxygen form superoxides (O₂⁻) mostly by taking electrons from electron transport chains of mitochondria and endoplasmic reticulum. In

each cell free radicals or oxyradicals are formed. It has been observed that in mice the number of free radicals hitting per cell per day is of the order of 1,00,000 while for human it is of the order of 10,000s^[2]. Antioxidant defense systems are designed to prevent the formation of oxyradicals or to neutralize them. The natural antioxidant defenses include antioxidant enzymes such as catalase, glutathione peroxidase, glutathione reductase, superoxide dismutase; metal binding proteins: ceruloplasmin, ferritin, hemoglobin, lactoferrin, metallothelnein, myoglobin, transferrin; oxyradical scavengers: bilirubin, uric acid, thiols (R-SH), Vitamin A, Vitamin C, Vitamin E, carotenoids, flavonoids; other antioxidant metalloenzymes: copper (CuZn-SOD), Manganese (MnSOD), Reduced glutathione (GSH), Zinc (CuZn-SOD), selenium (GPx). It is to be noted that the metals do not form essential components of either the nucleic acids or aminoacids but have a tremendous affinity for oxidation which fixes their role in an organism as being components of the antioxidant defense system. At a still deeper level deficiency of each metal (Cu, Zn, Mn) produces its characteristic impact on the physiology and psychology of an individual. The intake and circulation of metals in an organism is thus determined by the cellular requirements in the antioxidant defense system. The reason of oxidative stress is that the antioxidant defense of the organism is

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not efficient enough^[3].

Aging is correlated with the total number of free radicals produced by all cells and tissues^[4,5,6,7]. Intake of oxygen itself is an unavoidable evil which is automatically associated with its leakage and oxyradical formation, as if in the manifestation of life, the manifest order were ingrained with the disorder of oxygen toxicity and aging^[8,9,10,11]. Pearl suggested, aging is defined as the “rate of living”^[12]. It is also observed that in laboratory animals, caloric restriction results in increase of longevity and simultaneously it resulted in less DNA damage in nuclei and mitochondria^[13,14,15,16,17].

The numerous aging theories include genetic; immunity, ‘neuroendocrinal developmental; catastrophic error, glycosylation of protein, somatic mutation(stochastic)^[18] However, the free radical theory is the most fundamental one underlying all other aging theories. The oxyradicals attack deoxyribosyl backbone of the endogenous DNA. The endogenous DNA lesions are genotoxic in nature and they induce mutations. Thus the role of oxyradicals is significant in carcinogenesis and other forms of genetic and epigenetic changes towards cell transformation and progression of malignancy^[19]. Xu and Taylor gave profound evidence for epigenetic changes due to DNA methylation which increases incidence of cancer with age^[20]. Thus it supports the oxyradical theory of aging^[21] simultaneously with the oxyradical theory of cancer^[22]. Thus mutagenesis of mtDNA plays significant role in cancer initiation as well as in its malignancy and metastasis^[23,24].

Pivotal role of mitochondria:

At the physiological level the functional energy-producing organelle of the organism are the mitochondria. Mitochondria are the sites of cellular respiration driving all cellular processes through generation of ATP by processing the oxygen through electron transport chain^[25]. It is important to note that the leakage of oxygen occurs from the electron transport chain itself and free radical toxicity starts right from there.

The basic difference between a nucleotide and an amino acid is the presence of phosphorus in the former. Unless phosphate is transported, the DNA cannot replicate. ATP generation through electron transport chain enables the DNA to get their phosphate

supply for replication. During respiration, oxyradicals are generated, which need to be regulated through antioxidants for a systemic balance. It has been observed that any kind of stress in an organism leads to increased levels of oxyradicals which can potentially harm the smooth functioning of the cells and thus lead to diseases, aging and cell death^[26,27]. Stress can manifest in psycho-somatic ways on the physical body and can form tumors^[28,29]. Accidental physical stress can lead to fibrosis and cancer^[30]. Mitochondrial dynamics is responsible for stress-induced oncogene activation and stress-induced cell senescence indicating the pivotal role of oxyradicals^[31,32]. As long as the balance between oxyradical production and antioxidants is maintained, the cell undergoes a preprogrammed functioning leading only to programmed cell death or apoptosis.

Life and Cancer

The formation of reactive oxygen species (ROS) is unavoidably bound up with oxygen and hence with life itself. However, cancer cells have increased levels of ROS than the normal cells. The cycles of hypoxia and reoxygenation occur in the cancer cells^[33,34,35]. Due to low oxygen supply there results prolonged hypoxia condition which in principle should cause cell death. But cancer cells adapt to the hypoxia condition by using the “Warburg effect” as a metabolic switch to glycolysis^[36,37]. Glucose is catabolised to lactate and it is extruded through monocarboxylate transporters to the surrounding of cancer cells, while in normal cells glucose is converted into pyruvate and it is not extruded and is a potent antioxidant. In contrast to pyruvate lactate has no antioxidant effect. Further pyruvate in normal cells may be further metabolized to acetyl coA and pyruvate enters into Kreb’s cycle, where antioxidant intermediates are produced (e.g. Citrate, oxaloacetate, malate etc)

Enhanced rates of ROS have been detected in all cancers where they promote many aspects of tumour development and progression^[38]. Primarily mitochondrial dysfunction is the reason of high production of ROS^[33]. Stress is the primary reason of mitochondrial dysfunction as stress induces hypoxia condition and this hypoxia condition is the reason of cancer too. So, it justifies that life itself is ingrained with cancer and cancer has much prior origin to life itself^[9,10,11,39,40].

Origin of oxidative stress:

Presence of oxygen in the biomolecular environment produces oxidative stress on the molecules because of the active nature of oxygen to bond with H, C, N, P and O. Oxygen, Oxides, Peroxides and other oxyradicals tend to bond with and disrupt the configuration of biomolecules. This stress that hinders/accelerates the self-replication of biomolecules is the reason of all oxidative stress observed in evolved cellular systems. The transition from anaerobic to aerobic organisms in the course of evolution led to the emergence of huge diversity of species which was absent previously. Such a proliferation of aerobic species points to the operation of the principle of disorder or the cancer principle which ever acts in the direction of unrestrained proliferation^[8,9]. Oxyradicals therefore form a major pathway for cancer to operate through them in the history of evolution of life. Cancer cells are present in stromal cells and they cause oxidative stress and accelerate tumor progression. The oxiradicals thus control DNA mutation, cell proliferation, cell motility, invasiveness, stromal reactivity, cell signaling pathway, tissue repair and angiogenesis^[41].

Conclusion

From our focused analysis of the role of mitochondria in the production and control of free radicals we come to the inevitable conclusion that the life of a cell and hence of an organism is truly vested in its mitochondria. They are not mere sites of cellular respiration and ATP generation, but are the organelles where life has hidden itself. An understanding of mitochondria is therefore of paramount importance to understand aging and mortality and all related issues. The role of stress on the free radical production is something that has to be taken into consideration in any such programme of regulation of cellular function. We propose to investigate the connection of stress to the production of free radicals in a sequel to this paper. We are of the opinion that regulation of apoptosis can certainly lead to permanence of a cell's life as long as its essential processes are kept up by the mitochondria. Every cell can then be determined by such mitochondrial regulation to function at its dynamical optimum for as long as desired leading to the future possibility of immortality. This opens up exciting new avenues of research targeted at understanding the functioning of the mitochondria in relation to stress,

both psychological and physiological.

Ethical Clearance- Not needed for this kind of study

Source of Funding- Self

Conflict of Interest-NIL

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Measurement of Waist to Height Ratio as a Screening Tool for Obesity among Students

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Abstract

Introduction: Calculating a person's waist-to-height ratio is the most accurate and efficient way of identifying whether or not they are at risk of obesity in clinical practice.

Aims: The study aims to measure the waist to height ratio & its relationship with Waist hip ratio among students.

Methodology: Cross sectional study design was adopted for the study. 203 students who were studying B.Sc(N) in SRM College of Nursing were selected for the study as samples . It consisted of two sections. Section A dealt with demographic Variables such as Age, Year of Study, Gender, Residence, parents' educational level, Father occupation ,Mother occupation,Family size and Numbers of Siblings. Section B dealt with anthropometric measurements such as height , waist circumference and waist hip ratio.

Results: The current results showed that , with regard to Waist Height ratio of students , majority of students 83(41%) are healthy, 20% of them are overweight, 10% of them are extremely overweight and 7% of them are obese. Remaining 17% of them are slim and 5% of them are extremely slim. Regarding the Waist Hip ratio of students , 61.6 % (125students) were obese and 38.4% (78 students) represent Normal. There was positive correlation found between Waist Height ratio and Waist Hip ratio of students.

Conclusion: WHtR can be used especially when compared to BMI and WC as a screening tool for obesity and related cardiometabolic risks, and it can be recommended in clinical practice for obesity screening in children and adolescents.

Introduction

A person's waist-to-height ratio (WHtR), also called waist-to-stature ratio (WSR), is defined as their waist circumference divided by their height, both measured in the same units. The WHtR is a measure of the distribution of body fat. Higher values of WHtR indicate higher risk of obesity-related cardiovascular diseases; it is correlated with abdominal obesity.

A 2010 study that followed 11,000 subjects for up to eight years concluded that WHtR is a much better measure of the risk of heart attack, stroke or death than the more widely used body mass index. However, a 2011 study that followed 60,000 participants for up to 13 years found that waist-hip ratio was a better predictor of ischemic heart disease mortality than WHtR.

The WHR has been used as an indicator or measure of health, and the risk of developing serious health conditions. Research shows that people with "apple-shaped" bodies (more weight around the waist) face more health risks than those with "pear-shaped" bodies (more weight around the hips). A WHtR of over 0.5 is critical and signifies an increased risk. For people under 40 the critical value is 0.5, for people aged 40-50 the critical value is between 0.5 and 0.6, and for people over

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50 the critical values start at 0.6¹. Calculating a person’s waist-to-height ratio is the most accurate and efficient way of identifying whether or not they are at risk of obesity in clinical practice.²

Jung Ran Choi et al, investigated the association between the WHtR and incident hypertension. A total of 1718 participants, aged 39–72 years, were recruited in this longitudinal study. Logistic regression models were used to evaluate the WHtR as a significant predictor of hypertension. During the 2.8 years of follow-up, 185 new cases of hypertension (10.8%) were diagnosed, with an incidence rate of approximately 4% per year. The WHtR was significantly higher in the participants who had developed hypertension than in those who had not (0.54 ± 0.05 vs. 0.51 ± 0.05 , $p < 0.001$). The results showed that, A positive association between WHtR and the incidence of hypertension was observed in Korean adults. The findings of the present community-based prospective study suggest that the WHtR may be a better predictor of incident hypertension.³

Materials and Methods

Cross sectional study design was adopted for the study. 203 students who were studying B.Sc(N) in SRM College of Nursing during the academic year 2015–2016 were selected for the study as samples . They were selected by convenient sampling technique. The Samples were selected based on the Inclusion and Exclusion Criteria. The Inclusion criteria were a. Students aged between 18 and 22 years & b. Students who are interested to participate in the study. The Exclusion Criteria were a. Students with endocrine and metabolic diseases , b. Students who were physically challenged, c. Students who were on dietary restrictions or doing exercises or walking for weight loss & d. Students who were trying to increase weight

Tool For Data Collection:

It consisted of two sections. Section A dealt with demographic Variables such as Age, Year of Study, Gender, Residence, parents’ educational level, Father occupation ,Mother occupation,Family size and Numbers of Siblings. Section B dealt with anthropometric measurements such as height , waist circumference and waist hip ratio. The researcher measured the anthropometric measurements at the examination room .All measurements were taken using the same type of

apparatus.

- Height was measured to the nearest 1 cm while the students stood straight on the stadiometer barefoot and the head aligned so that the auditory canal and lower rim of the orbit were in a horizontal plane.

- Weight was measured to the nearest 0.5 kg using digital scales while the students wore a light school uniform and were barefoot.

- Waist circumference was measured by making the student stand up straight and breathe out. Used a tape measure to check the distance around the smallest part of their waist, just above their belly button.

- Hip circumference was measured at the distance around the largest part of the hips — the widest part of the buttocks and then Calculated the WHR by dividing the waist circumference by the hip circumference.

Ethical Consideration

Formal permission was obtained from Head of the Institution. Then the researcher visited the College Students to inform them about the survey. Informed consent was obtained from the study participants, after explaining the nature and duration of the study. Assurance was given to the individuals that each individual report will be maintained confidentially.

Statistical Analysis

Statistical analysis was done by using Statistical Package for Social Sciences-16.

Results

Table 1: Frequency And Percentage Distribution Of Waist Height ratio of students

N=203

S.No	Category	No.of students (n)	Percentage distribution (%)
1	Extremely Slim	11	5
2	Slim	34	17
3	Healthy	83	41
4	Overweight	41	20
5	Extremely Overweight	20	10
6	Obese	14	7

The above table results showed that, Majority of students 83(41%) are healthy, 20% of them are overweight, 10% of them are extremely overweight and 7% of them are obese. Remaining 17% of them are slim and 5% of them are extremely slim.

Table 2: Frequency And Percentage Distribution Of Waist Hip ratio of students

N=203

S. No.	WHR Level	No. of girls	Percentage distribution (%)
1	Normal	78	38.4
2	Obese	125	61.6
Total		203	

The table shows that, 61.6 % (125students) were obese and 38.4% (78 students) represent Normal.

Table 3: Correlation between Waist Height ratio and Waist Hip ratio of students

N=203

Variables	Pearson's Correlation Correlation
WHR	r=0.464
Waist height ratio	

The results indicates that, there is positive correlation found between Waist Height ratio and Waist Hip ratio of students and the r value was 0.464.

Discussion

WHR is used as a measurement of obesity, which in turn is a possible indicator of other more serious health conditions. The WHO states that abdominal obesity is defined as a waist-hip ratio above 0.90 for males and above 0.85 for females, or a body mass index (BMI) above 30.0.^[5] The National Institute of Diabetes, Digestive and Kidney Diseases (NIDDK) states that women with waist-hip ratios of more than 0.8, and men with more than 1.0, are at increased health risk because of their fat distribution.^{1,4}

The waist-to-height ratio (WHtR), calculated by dividing the waist circumference (WC) by height, has recently gained attention as an anthropometric index for central adiposity. It is an easy-to-use and less age-dependent index to identify individuals with increased cardiometabolic risk. A WHtR cutoff of 0.5 can be

used in different sex and ethnic groups and is generally accepted as a universal cutoff for central obesity in children (aged ≥ 6 years) and adults. However, the WHtR has not been validated in preschool children, and the routine use of WHtR in children under age 6 is not recommended. Prospective studies and meta-analysis in adults revealed that the WHtR is equivalent to or slightly better than WC and superior to body mass index (BMI) in predicting higher cardiometabolic risk. In children and adolescents, studies have shown that the WHtR is similar to both BMI and WC in identifying those at an increased cardiometabolic risk. Additional use of WHtR with BMI or WC may be helpful because WHtR considers both height and central obesity. WHtR may be preferred because of its simplicity and because it does not require sex- and age-dependent cutoffs; additionally, the simple message 'keep your WC to less than half your height' may be particularly useful.⁵

The current results showed that , with regard to Waist Height ratio of students , majority of students 83(41%) are healthy, 20% of them are overweight, 10% of them are extremely overweight and 7% of them are obese. Remaining 17% of them are slim and 5% of them are extremely slim. Regarding the Waist Hip ratio of students , 61.6 % (125students) were obese and 38.4% (78 students) represent Normal. There is positive correlation found between Waist Height ratio and Waist Hip ratio of students.

The study was supported by Arda Kilinc etal and they investigated the prevalence of obesity and associated factors during childhood in Southeastern Turkey. The community-based descriptive cross-sectional study was conducted with 2718 primary school/high schools students aged 6-17 years. The prevalence of overweight, obesity, abdominal obesity, was 13.2%, 4.2% ,26.4%, respectively. There was a reverse relationship between BMI/WC values and sleep durations ($p<0.05$). The BMI/ WC values were higher in students with computer usage time ≥ 1 hours in a day ($p<0.05$). Parental obesity status has an effective role on the WC/BMI values of children ($p<0.05$). The WHtR was a good predictor of diagnosis on obesity and abdominal obesity. The WHtR can be used for diagnosis of obesity/abdominal obesity.⁶

Conclusion

The current results showed that , with regard to Waist Height ratio of students , majority of students 83(41%) are healthy, 20% of them are overweight, 10% of them are extremely overweight and 7% of them are obese. WHtR can be used especially when compared to

BMI and WC as a screening tool for obesity and related cardiometabolic risks, and it can be recommended in clinical practice for obesity screening in children and adolescents.

Conflict of Interest: Nil

Source of Funding: Self

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Prevalence of Fatigue and Physical Activity after Acute Myocardial Infarction

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Abstract

Background and Objectives: Objective of this study was to find out the fatigue and physical activity after acute myocardial infarction. On the basis of RPFScale the assessment was of been done for fatigue.

Methodology: There were total 80 subjects in this study. This was a study of fatigue examination in post myocardial infarction patients. Here we evaluated the intensity of the fatigue in the older adults of Acute Myocardial Infarction and graded the intensity on the basis of RPFScale.

Result: There is increase in fatigue in the post acute myocardial infarction older adults. Increased fatigue is found more in the age group of 60-65 years of older adults as compared to age group of 66-70 years of older adults.

Conclusion: By this study, it is concluded that there is prevalence of fatigue in older adults post acute myocardial infarction.

Keywords: *Myocardial infarction, fatigue, physical activity.*

Introduction

Myocardial Infarction is a clinical syndrome, that results from sudden occlusion of coronary artery with resultant infarction and death of cardiac myocytes in the region supplied by that artery.

CAUSES of Myocardial Infarction: -

Peripheral Vascular Disease.

Diabetes.

Lack of Physical Activity.

Abnormal Obesity.

Unhealthy diet.

Atherosclerosis.

Hypertension.

Genetics.

Cardiac structure is a major determinant of function, which is depressed after Myocardial Infarction. After Myocardial Infarction, both short term and long term compensatory or regulatory mechanisms are activated.

People with lack of exercise are more in number suffering from cardiovascular disorders mostly Myocardial Infarction. [1]

Cardiovascular diseases are among the most common cause of morbidity and mortality worldwide that account for 35% of global deaths. According for WHO, 12 million people die annually of Cardiovascular diseases.

Fatigue is most common symptom reported 5 months after acute Myocardial Infarction. Older adult's

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participation in physical activity is negatively influenced by fatigue.^[17]

Fatigue is defined as the feeling of lack of energy and feeling of tiredness that has a gradual onset. Fatigue may cause decreased ability to do work or do a physical activity, be involved with family, socialize with friends and or complete daily activities.

Physical Activity is defined as any bodily movement that increases the energy expenditure above the basal metabolic rate, and it should be performed at an intensity level that offers health benefits.

Fatigue has been associated with aging; thus, aging may be a covariate of persistent fatigue post-Acute Myocardial Infarction. Besides the incidence and the prevalence of anemia increases with the age and fatigue is the symptom of anemia.^[10]

The World Health Organization defines Quality of Life as the individual’s perception of their position in life in the context of culture and values system in which they live in relation to their goals, expressions, standards, and concerns.

It is subjective, multidirectional concept that defines a standard level for emotional, material and social well-being.

Acute Myocardial Infarction is a common disease with the serious consequences in mortality, morbidity, and cost to the society.

According to WHO’s definition, a Myocardial infarction occurs if at least 2 or 3 criteria are fulfilled; typical ischaemic chest pain; raised concentration of creatine kinase-MB in serum and typical electrocardiographic findings, including development of pathological Q-waves.

Myocardial Infarction is a major cause of morbidity and mortality worldwide. More than 3 million people each year are estimated to have an Acute ST-Elevation Myocardial Infarction with more than 4 million having a Non-ST-Elevation Myocardial Infarction.

Acute Myocardial Infarction is an event of myocardial necrosis caused by unstable ischaemic syndrome. In practise the disorder is diagnosed and assessed on the basis of the clinical evaluation, the electrocardiogram, biochemical testing, invasive and non-invasive imaging, and the pathological evaluation.

Post-Acute myocardial Infarction is characterized by chest pain, fever, pericarditis with friction rub, pleurisy, pleural effusion, joint pain and elevated white blood cells count and sedimentation rate.

Methodology

Total 80 subjects were approached in the Krishna Hospital, Karad who fulfilled the inclusion criteria for the study. There were 40 male and 40 female participants. The subjects were divided into 2 groups where 1 group contained 40 participants with the age group of 60-65 years and the other group contained 40 participants with age group of 65-70 years. The procedure was explained and consent was been taken from those participated in this study. Here we evaluated the intensity of the fatigue and graded them on the basis of the Revised piper Fatigue Scale.^[15] Data was collected. Later statistical analysis was done in accordance to distribution of age, both genders and score on the RPF scale.

Statistical Analysis and Results

Statistical analysis of the recorded data was done. Study design is cross sectional. Arithmetic mean and standard deviation was calculated for each outcome measure. T test was done. The study has p value <0.000 and was extremely significant.

TABLE NO.1 RPF SCORE IN AGE GROUP 60-65

	Mean ±SD	T value	P value	Interference
Age 60-65 yrs	62.2±1.6	235.9	< 0.0001	Extremely significant
RPFS	68.9±4.56	95.6	< 0.0001	Extremely significant

TABLE No.2: RPFS SCORE IN AGE GROUP 66-70

	Mean \pm SD	T value	P value	Interference
Age 66-70 yrs	68.25 \pm 1.4	298.6	< 0.0001	Extremely significant
RPFS	77.0 \pm 8.6	56.0	< 0.0001	Extremely significant

Discussion

Myocardial Infarction is a clinical syndrome, that results from sudden occlusion of coronary artery with resultant infarction and death of cardiac myocytes in the region supplied by that artery.

Fatigue is defined as the feeling of lack of energy and feeling of tiredness that has a gradual onset. Fatigue may cause decreased ability to do work or do a physical activity, be involved with family, socialize with friends and or complete daily activities.

Physical Activity is defined as any bodily movement that increases the energy expenditure above the basal metabolic rate, and it should be performed at an intensity level that offers health benefits.

The aim of this study was to find the prevalence of fatigue and physical activity after acute myocardial infarction. The duration of this study performed was for 6 months where the patient's concern was been taken and assessed the fatigue of the subjects with the help of the Revised Piper Fatigue Scale.

The RPFS is a 22-item instrument designed to capture four dimensions of subjective fatigue: 1) The behavioral/ severity subscale explores the extent to which fatigue causes distress or interferes with enjoyable activities such as socialization with friends. 2) The affective meaning subscale related to the emotional meaning of fatigue and includes items such as the choice to describe the fatigue as protective or destructive or as positive or negative. 3) The sensory subscale comprises descriptors of physical sensations associated with fatigue such as strong or weak, awake or sleepy, and lively or listless; and 4) the cognitive/mood subscale describes how fatigue affects thinking processes and mood state

with terms such as exhilarated or depressed.^[15]

There were 80 subjects taken for this study and the fatigue level in them was been assessed.

Table No. 1.1 shows the RPFS score of the age group 60-65 years was 68.9.

Table No. 2.1 shows the RPFS score of the age group 66-70 years was 77.0.

This study proved that the intensity of fatigue in the age group 66-70 years had increased as compared to the age group 60-65 years.

Conclusion

After assessment of 80 subjects, this study shows that the mean of RPFS of age group 60-65 is 68.9 and the RPFA of age group 66-70 is 77.0. The study shows that the intensity of fatigue is more in age group 60-65 as compared to 66-70 years.

Conflicts of Interest: There were no conflicts of interests in this study.

Ethical Clearance: Ethical clearance was taken from the institutional committee of Krishna Institute of medical sciences, deemed to be University, Karad.

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Breast Milk Components and Neurodevelopment of Children

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Abstract

Breast milk is considered the gold standard in pediatric nutrition. It contains a wide range of nutrients and other bioactive factors that support enteric and immunologic development of neonates. Some of these constituents have neurobiological properties that play vital role in early brain development and facilitate cognitive development. Understanding the role of these functional nutrients in modulating developmental processes in the brain is emerging area of research. These developmental events depend not only on availability of nutrients, but it also depends on a variety of growth factors and proteins. These components are transported from the mother to the fetus via the placenta prenatally and postnatally through milk. Many studies have highlighted a positive association between breastfeeding on structural brain development, such as increased white matter development and increased cortical thickness. Reports also suggest beneficial effects of breastfeeding on brain and cognitive development from infancy to in adolescence. This review discusses various components in breast milk components which can influence neurodevelopment in children.

Key words: Brain development, Breastfeeding, Breast milk, Cognition

Introduction

Early life nutrition is important for the growth and development of the infant. The World Health Organization and United Nations Children's Fund jointly developed the global strategy for exclusive breastfeeding during the first six months of life.¹ Many studies provide evidence of short and long-term benefits of breastfeeding during the critical periods of development. Breastfeeding is also shown to influence the long-term health of children.² Accumulating evidence suggests that breastfeeding reduces the risk of non communicable and neurodevelopmental disorders in childhood and adulthood.³

Breast milk provides optimal nutrition for the first six months of life. It is the only source of nutrients and bioactive components like growth factors, cytokines and hormones during infancy.⁴ These components support brain, enteric and immunologic development of neonates.⁵ The article describes the possible role of various nutrients and bioactive components in breast milk which influence neurodevelopment of the children.

Breastfeeding and Neurodevelopment in Children

The relationship between breastfeeding and neurodevelopmental outcome was first discussed in 1929 when Hoefler and Hardy examined the mental and physical outcomes of children at 7 to 13 yrs of age. They concluded that children who had been breastfed for 4 to 9 months outperformed in motor and language development.⁶ Horwood and Fergusson also observed a positive relationship between breastfeeding and a variety of beneficial educational outcomes.⁷ It has been reported that children who were breastfed for more than 6 months had higher test scores at 10 yrs of age as compared to non-breastfed children.⁸ In a group of Asian and Greek toddlers, increased exposure to breastfeeding is reported

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to be associated with higher scores of cognitive and language development.^{9,10} In school aged children (8-11 yrs) who were breast fed, a positive association was found between learning skills as compared to the never-breastfed children.¹¹

The duration of breastfeeding is also shown to be associated with cognition. Longer duration of breastfeeding, particularly full breastfeeding is reported to have beneficial effects on child neuropsychological outcomes¹² and with higher verbal and nonverbal IQ at 7 yrs of age.¹³ Increasing duration of breastfeeding showed gradual increase in cognitive developmental score from infancy through the preschool age.¹⁴

Breastfeeding in the first 2 months of life is shown to be associated with structural markers of brain development in infants. Breastfed children exhibited increased white matter development, upto 4 yrs of age.¹⁵ A recent report reveals improved myelination in breastfed children compared to children who were exclusively formula-fed.¹⁶

The findings of the above studies indicating beneficial effects of breastfeeding on neurodevelopmental outcome could be possibly attributed to breast milk nutrients and bioactive components and is depicted in Fig 1. Human milk is suggested to improve cognition by providing vital components like fatty acids, amino acids, choline, lactose, iron, copper, vitamin A, creatine, and neurotrophic factors to the infant. The role of each of these components is discussed below.

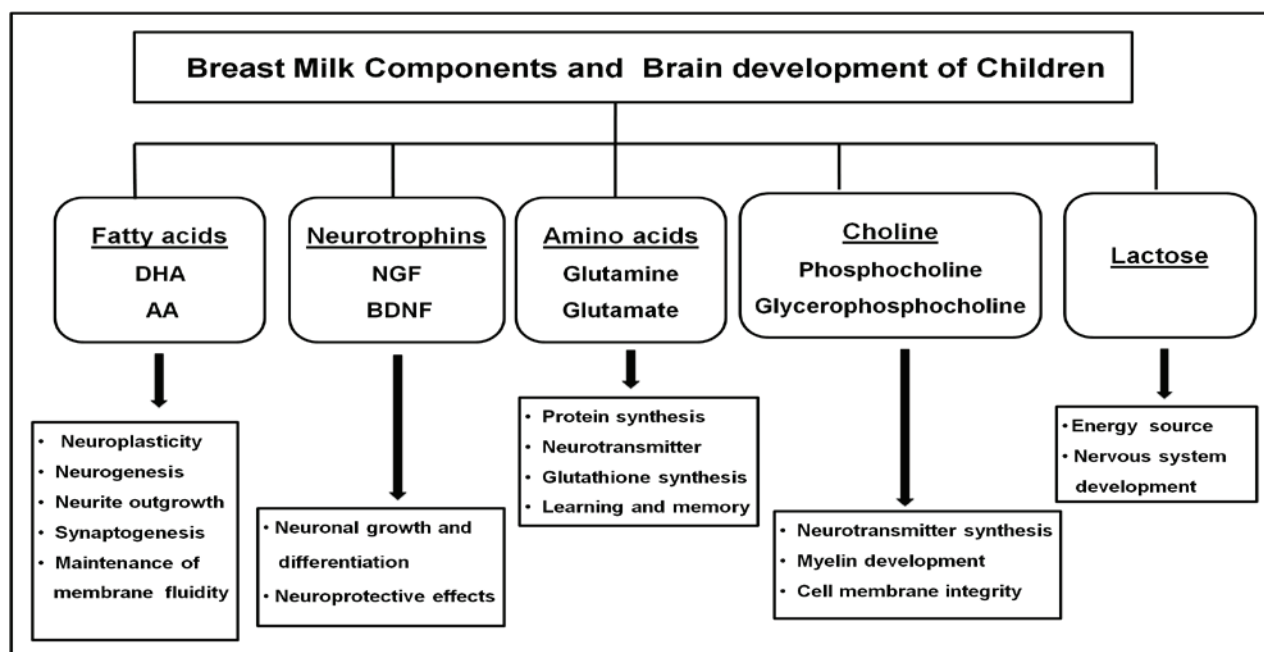


Figure 1: Breast Milk Components and Brain Development of Children

DHA - Docosahexaenoic Acid; AA - Arachidonic Acid; NGF - Nerve Growth Factor;

BDNF - Brain-Derived Neurotrophic Factor

Components of Breast Milk and Cognition in Children

Fatty Acids

Human milk contains 3-5 % of total fat. It is the main source of energy for the newborn. Essential fatty acids are the integral part of cell membranes and play a main role in mental and visual development. Two fatty acids are essential for humans: alpha-linolenic acid and linoleic acid. They are found in breast milk and serve as precursors for long chain polyunsaturated fatty acids (LCPUFA) like docosahexaenoic acid (DHA)

and arachidonic acid respectively. These fatty acids are involved in many neurobiological processes like learning and memory. Many studies have shown that PUFA levels in the colostrum are associated with IQ in children up to 6 yrs of age.^{17, 18} High content of DHA, in breast milk is reported to be associated with better school performance at 12 yrs of age.¹⁹

Amino Acids (AA)

AA in breast milk support growth of the infant during the first months of life. Glutamate, glutamine and taurine are the most abundant free AA in human milk. A number of AA like taurine, glutamate, glutamine and glycine, are recognized as precursors of neurotransmitters that play a key role in long-term potentiation, synaptic plasticity and are important for cognitive functions like learning and memory. In a randomized controlled trial, taurine supplementation showed more mature auditory-evoked responses in healthy infants as compared to infants who did not receive taurine supplementation.²⁰ In follow up studies, enteral glutamine supplementation showed no effect on cognitive, and behavioural outcomes at 2 and 7.5 yrs of age.^{21, 22} Limited studies have attempted to explore the relation between AA and neurodevelopment or cognition.

Choline

Milk contains a high concentration of choline, phosphocholine and glycerophosphocholine.²³ Choline is important for the synthesis of membrane phospholipids, specifically phosphatidylcholine. Choline can also be found in sphingomyelin, another membrane phospholipid formed from phosphatidylcholine. Choline is a precursor of acetylcholine, which is a neurotransmitter and is required for lifelong memory function. Choline supplementation during pregnancy is reported to improve memory in infants at 6 to 12 mo.²⁴ Recently, Caudill et al, reported that maternal choline supplementation during the third trimester of pregnancy improves infant information processing speed at 13 mo of age.²⁵

Lactose

Lactose, a major component of human milk and it provides energy for the growth of the infants. Human milk contains higher quantity of lactose compared with milk

of other species in order to meet high energy demands of the human brain.²⁶ It is relatively low in colostrum, and increases over time. The body breaks it down into two simpler sugars, glucose and galactose. Galactose is a valuable nutrient for brain tissue development. Taib et al. reported that the children who consumed lactose–isomaltulose-containing milk showed better cognitive performance at 5–6 yrs,²⁷ suggest carbohydrate composition has effects on some aspects of cognitive performance such as attention and memory. However, there is limited literature on role of breast milk lactose and cognitive performance in children.

Iron

The iron content of the breast milk is vital for the optimal survival of the newborn baby. Iron levels in the milk decreases with increase in lactation age. Iron is essential for myelination, and it has been demonstrated that iron-deficiency can cause altered myelination in infants.²⁸ It is also reported that in infants with iron-deficiency anemia is associated with poor mental developmental outcomes than children without iron deficiency.²⁹ Iron metabolism is interrelated to DHA and may be associated with suboptimal functional outcomes in infants.³⁰ Iron deficiency affects Δ -6-desaturase activity i.e., the synthesis of essential fatty acids and has a major impact on neurodevelopment.³¹ Iron supplementation in LBW infants was reported to improve neurocognitive and motor development 5.3 yrs of age.³²

Zinc

In first six months of life, breast milk is a sole source of zinc. Its concentration is high in colostrum than mature milk. Zinc is essential for the development of the central nervous system, particularly for formation and migration of neurons along with the formation of neuronal synapses. Both animal and human studies suggest that zinc deficiency can lead to delays in cognitive development.^{33, 34} A study on zinc supplementation to children have shown no effect on motor development and cognitive functioning.³⁵

Copper (Cu)

Cu is an element necessary for synthesising haemoglobin, forming myelin sheaths in the nervous

system. The content of Cu in breast milk depends on the stage of lactation i.e. the highest content found in colostrum.³⁶ Most of the studies have found no effect of dietary intake on milk Cu levels.^{37, 38} Bumoko et al reported lower serum levels of Cu with neuromotor impairments in children with konzo, a motor neuron disease.³⁹

Vitamin A

Vitamin A is crucial for the normal growth and development of the infant. During the first 6 months of life, vitamin A is transferred through breast milk which is 60 times higher than the transfer occurring through the placenta.⁴⁰ Vitamin A is three times higher in colostrum than mature milk. In animal study, vitamin A deficiency has been shown to be associated with neurodevelopmental delays⁴¹ and learning and spatial memory deficits.⁴² Low level of vitamin A in premature infants at birth can last through the entire infancy.⁴³ In contrast, preconceptional to postpartum maternal vitamin A supplementation is reported to impart no benefits on cognition at ages 10-13 yrs of age.⁴⁴

Neurotrophins

Neurotrophins play a crucial role in the development of the central nervous system and in the postnatal development of the enteric nervous system.⁴⁵ There are a variety of neurotrophic factors that have been identified. Among these, NGF (nerve growth factor), BDNF (brain-derived neurotrophic factor) and glial cell-line-derived neurotrophic factor are found in the breast milk.⁴⁶ NGF and BDNF control neuronal apoptosis during brain development and play an important role in neuronal differentiation, survival and growth of neurons and also modulate synaptic plasticity. BDNF is involved in different aspects of learning and memory processing, such as memory persistence and storage. NGF is also critical for enhancing memory formation and facilitating hippocampal long-term potentiation. These reports show the potential of breast milk components to enhance cognitive development. However, the role of breast milk neurotrophins in improving cognition in children is unclear.

Concluding Remarks

Breast milk is the primary source of nutrition to

the newborn which contains a wide range of nutrients and other bioactive factors which play a vital role in the development of central nervous system. These components work in concert with each other and influence brain development. The current review provides some evidence on the beneficial roles of breast milk components on cognitive performance in children. It supports the existing policies to promote breastfeeding for 6 months to improve infant growth. Understanding of the molecular and cellular mechanisms through which breast milk nutrients and bioactive components influence neurodevelopmental pathways of the infant is an important step towards preventing adverse neurodevelopment in infants.

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Type of Article: Original Research Article

An Observational Study to Assess the Challenges and Gaps in PPTCT Programme in KIMS, Hubli

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Abstract

Background: Every year 8 lakh children get HIV infection from their mothers either during pregnancy, child birth or breast feeding. In the absence of any active intervention, around 56,700 infected babies will be born annually. PPTCT programme was started in India in the year 2002 with an aim to reduce the perinatal transmission of HIV. Hence, determining the challenges and gaps in PPTCT programme, will be helpful to make this programme a success.

Objectives:

Ø To assess the awareness about HIV and the PPTCT programme among the pregnant population attending ANC OPD, KIMS.

Ø To compare the awareness about PPTCT programme among HIV positive pregnant women and general population visiting ANC.

Ø To assess the challenges and gaps in the implementation of PPTCT in KIMS

Methodology: A time bound observational study was conducted for a period of six month. Separate pre-tested and semi-structured questionnaire is used to collect the information from women attending ANC OPD, HIV positive women attending ANC OPD, obstetricians and PPTCT staff, KIMS. Data was entered in MS Excel & analysed using software SPSS 20.

Results: 32% of the women attending ANC OPD did not know about MTCT. Only 26.5% of the ANC women who know about MTCT were aware about PPTCT and 32% of the ANC women were not aware of both MTCT and PPTCT. 86.7% of the HIV positive pregnant women who underwent post-test counselling were aware about MTCT and only 33.3% were aware about PPTCT.

Conclusion: Illiteracy and social stigma are the two main factors that are responsible for the lack of identification of the HIV cases. The main gaps in the programme are because of lack of adequate number of counsellors and lack of follow up of the patients.

Keywords: *HIV, PPTCT, ANC, gaps*

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Introduction

According to UNAIDS/WHO data there are over 39.5 million people living with HIV/AIDS worldwide and 17.5 million are women of reproductive age (UNAIDS/WHO, 2006).¹ There are an around 2.5 million HIV-infected persons in India. Nearly 30% are women of reproductive age who are often diagnosed for

the first time during pregnancy.²

Around 800,000 children get infected with HIV infection from their mothers every year worldwide — either during pregnancy, childbirth, or breastfeeding. Countries have the potential to prevent a large proportion of these infections through low-cost, effective interventions.³ Informing the population about the routes of HIV transmission from a mother to her baby and that the risk of transmission can be reduced by using antiretroviral drugs are critical in reducing transmission of the virus from mothers to their babies.⁴ HIV tests as part of routine antenatal care increases the proportion of women who are tested but some women do not collect test results. Although quality of counselling is one key factor in motivating women to take the HIV test, making the test a routine part of ANC is also important to encouraging women to get tested.³

In the absence of an active intervention, around 56,700 infected babies will be born annually. The PPTCT programme was started in India in the year 2002, with the aim of reducing the perinatal transmission of HIV, following feasibility study in 11 major hospitals in the high prevalence states.⁵

HIV sentinel surveillance (HSS) among antenatal clinic (ANC) attendees has been used to monitor HIV trends as well as to estimate the number of people with HIV. Recently, information on HIV infection has also become available from prevention of parent-to-child transmission (PPTCT) programmes.⁶

Women change their mind after agreeing to the HIV test or may have acquiesced to the health workers recommendation to have an HIV test without being convinced of the benefits. Test results are frequently delayed and women give up waiting for them, are told to come another day, or deliver before results are ready. If they have relatively little interest in finding out their HIV status, they might not want to go to the trouble of returning to the clinic or inquiring on their next visit. Also, many women agree to the test but then want to consult with their husband before receiving the results. Some husbands may object to their wife knowing whether she is infected. And some women have economic reasons, such as lack of money for transportation to return to the clinic.³

This study aims to find out many of such challenges and gaps facing the PPTCT programme in KIMS, Hubli.

Objectives

1. To assess the awareness about HIV and the PPTCT programme among the pregnant population attending ANC OPD, KIMS.
2. To compare the awareness about PPTCT programme among HIV positive pregnant women and general population visiting ANC.
3. To assess the challenges and gaps in the implementation of PPTCT in KIMS.

Methodology

Type of study: observational, time bound study.

Duration of study: 6 months (January to June 2011)

Source of data:

1. Pregnant women attending ANC OPD, KIMS Hubli.
2. HIV + women registered under the PPTCT programme in KIMS.
3. ICTC staff and Obstetricians, KIMS.

Methods of collection of data:

Pre tested and semi-structured questionnaire is used to collect the information from the study group after obtaining the verbal consent regarding challenges and gaps in PPTCT programme in KIMS.

Separate questionnaires were given to 50 women attending ANC OPD, 15 HIV+ women registered attending ANC OPD, 20 obstetricians and 16 PPTCT staff, KIMS.

Inclusion criteria:

1. Pregnant women attending ANC OPD, KIMS Hubli.
2. HIV + women both antenatal and postnatal registered in ICTC, KIMS.
3. ICTC staff and Obstetricians, KIMS.

Confidentiality was maintained regarding the details of the study participants.

Data was entered in MS Excel 2013 & analysed using IBM SPSS v20.0.

Results were presented in the form of percentages and Chi-Square test was applied wherever necessary.

Results

Table 1: Table showing the effect of education status and address (rural or urban) on the knowledge about HIV transmissibility among subjects attending ANC, OPD

VARIABLE	IS HIV TRANSMITTABLE?		
	YES	NO	DON'T KNOW
EDUCATION			
HIGHER EDUCATION	2	0	0
SECONDARY EDUCATION	27	2	1
PRIMARY EDUCATION	10	1	3
ILLITERATE	0	1	3
ADDRESS	YES	NO	DON'T KNOW
RURAL	24	4	5
URBAN	15	0	2

The knowledge about HIV transmissibility was lower among the illiterates and the people with primary education when compared with secondary and higher education completed subjects attending ANC, OPD. The knowledge about HIV transmissibility was lower among rural subjects when compared to urban subjects attending ANC, OPD. (Table 1)

Table 2: Knowledge about mode of spread of HIV among 50 ANC women Interviewed

MODE OF SPREAD	FREQUENCY	PERCENTAGE
TOUCH	7	14
SEXUAL TRANSMISSION	33	66
SNEEZE	14	28
BLOOD TRANSFUSION	31	62
DON'T KNOW	14	28

66% of the women attending ANC OPD said sexual transmission is the mode of spread of HIV and 62 % said it can be transmitted by blood transfusion

Table 3: Table showing awareness about mother to child transmission among the women attending ANC OPD

AWARENESS ABOUT MOTHER TO CHILD TRANSMISSION	FREQUENCY	PERCENTAGE
YES	34	68
NO	4	8
DON'T KNOW	12	24
TOTAL	50	100

32% of the women attending ANC OPD did not know about mother to child transmission

Table 4: Table showing awareness about PPTCT programme among the ANC population who know about MTCT

MTCT	AWARENESS OF PPTCT		TOTAL
	YES	NO	
YES	9	25	34
NO	0	16	16
TOTAL	9	41	50

Only 26.5% of the ANC women who know about MTCT were aware about PPTCT and 32% of the ANC women were not aware of both MTCT and PPTCT

- 86.7% of the HIV positive pregnant women who underwent post-test counselling were aware about MTCT and only 33.3% were aware about PPTCT

- 66.7% of the HIV positive patients faced social stigma, 46.7% of the HIV positive patients faced family stigma.

Table 5: Percentage of beneficiaries who underwent pre-test counselling

SOURCE OF DATA	COUNSELLED	NOT COUNSELLED	PERCENTAGE COUNSELLED
2011 JAN STATISTICS BY ICTC KIMS	274	1	99.6
2011 PROJECT BY KIMS STUDENT	6	9	40

In the present study it was observed that only 40% of the patients underwent pre-test counselling; while the ICTC records placed the figure as 99.6%.

Table 6: Gaps in the PPTCT programme according to staff in PPTCT, KIMS

ISSUE	FREQUENCY
AVAILABILITY OF DRUGS	9
NUMBER OF COUNSELLORS	16
FOLLOW UP OF PATIENTS	16
UPDATING OF STAFF KNOWLEDGE	9

Almost all staff in PPTCT, KIMS thought that the main gaps in the programme are because of lack of adequate number of counsellors and lack of follow up of the patients

Discussion

According to NFHS-3 data, only 40% of currently pregnant women know that HIV/AIDS can be transmitted from a mother to her child and only 15% are aware that transmission from a mother to her baby can be reduced by taking certain drugs; whereas in our study, 68% of the pregnant women knew about mother to child transmission.⁴

In our study we found that 8.2% of women tested did not receive their results.

The major reasons can be; women change their mind after agreeing to the HIV test or may have agreed to the health workers recommendation to have an HIV test without being convinced of the benefits under pressure. Test results are frequently delayed and women give up waiting for them. Also, many women agree to the test but then want to consult with their husband before receiving the results. Some husbands may object to their wife knowing whether she is infected. And some women have economic reasons, such as lack of money for transportation to return to the clinic.

Television is by far the most common source of information on AIDS, reported by 80 percent of both women and men who have heard of AIDS. The next most frequently reported sources after television are radio (37% of women and 55% of men), friends/relatives (32 % of women and 44 percent of men), and newspapers/magazines (27% of women and 52% of men). In our study, we found that media (TV, radio and newspaper together account for 32% followed by information through health worker.⁴

In our study we found that 89.55% of the MB pairs received NVP Prophylaxis whereas in a study conducted by Parameshwari et al. Forty seven of them (83%) received nevirapine.⁷

Sites in Burundi and Rwanda, as well as in India, Kenya, and Uganda, offer pre-test counselling as a routine component of antenatal care and thus nearly all women who come for services are counselled which is similar to our study where almost all subjects received pre-test counselling.³

According to the PPTCT guidelines; in a developing country like India, exclusive breast feeding needs to be followed for a period of 6 months as people cannot afford the replacement feeds. But in our study we found that only 40% of the doctors advised exclusive breast feeding, while the rest advised replacement feeds.

Conclusion

Ø Around 62% of the women attending ANC OPD were aware about the routes of transmission of HIV.

Ø 32% of the ANC women were not aware of both MTCT and PPTCT pointing towards focus on awareness regarding the disease.

Ø Majority of the HIV positive pregnant women who underwent post-test counselling were aware about MTCT and only one third were aware about PPTCT.

Ø 93% of the HIV positive women have faced some kind of stigma in their life. The main gaps in the programme are because of lack of adequate number of counsellors and lack of follow up of the patients.

Limitations:

Ø Sample size was small so the results cannot be generalized.

Ø Study duration was short (1 month)

Ø -Most of the results obtained were from HIV+ women linked to the positive networks. Thus the results cannot be generalized to the entire HIV+ population.

Recommendations:

Ø Increasing the number of counsellors in ICTC, KIMS.

Ø Introducing rapid HIV tests so that women can receive same day counselling, HIV testing, and test results.

Ø Improving the quality of HIV and infant feeding counselling and active supervision

Ø Increasing the participation and linkage of positive networks to HIV+ people and providing the positive network people with job aids, monetary benefits etc.

Ø Regular training and integration of training for all health care providers concerned with PPTCT for efficient implementation.

Ø Expanding the vision of PPTCT to encompass an active role for fathers and male partners.

Ø Health campaigns to reduce stigmas and increase the awareness about HIV.

Ø Decrease the loss to follow up in the existing PPTCT centres.

Declaration

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Conflict of Interest: None declared

Ethical Approval: Not required

Informed consent: “Informed consent was obtained from all individual participants included in the study.” Confidentiality and anonymity was maintained.

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A Study on Dental Caries and Risk Factors for Non Communicable Diseases among Undergraduate Medical Students of Palakkad District, Kerala

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Abstract

Background: Dental caries is the most widespread oral disease worldwide and constitutes a major global public health challenge. The modifiable risk factors for dental caries and non communicable diseases are obesity, unhealthy diet, tobacco use, alcohol consumption. **Aims:** To find out the association between dental caries and risk factors for non communicable diseases among medical students. **Methods:** A cross-sectional study was done among undergraduate medical students of our institution and total 554 students were included. They were asked to visit dental clinic for dental examination and their risk factors for non communicable diseases like body mass index, waist hip ratio, and family history of diabetes mellitus, regular exercises and type of personality were recorded using a self administered questionnaire. **Statistical analysis used:** SPSS version 20 was used for analysis. **Results:** The dental caries was present among 428 (77.3%) of undergraduate medical students. Out of 554 students 144 (26%) of them were overweight and 92(16.6%) were obese. There was statistically significant association between BMI, waist hip ratio and dental caries. **Conclusions:** The present study concludes that those students with higher BMI and high risk of waist hip ratio had higher prevalence of dental caries. Since the risk factors are common for dental caries and non communicable diseases a healthy eating habits and lifestyle modification need to be started in all medical colleges.

Key-words: *Dental caries, Non Communicable diseases, Risk factors, Medical students*

Introduction

Oral health refers to health of our mouth and ultimately support and reflect the health of entire body. The mouth is the mirror of the body often reflecting the signs of systemic diseases. Examination of mouth reveals number of chronic conditions as well as infectious diseases. On the other hand many general health conditions cause infection, inflammation and

serious impact on oral cavity. For e.g. - Diabetes Mellitus predisposes to the development of periodontal disease. (1) Apart from its association with diabetes, previous literature had shown that oral diseases were also related to the development of the cardiovascular diseases.(2) Oral cancers, is considered as world's most common cancers and the two major risk factors responsible for development are tobacco use, and excessive intake of alcohol.(3) Most oral diseases share common risk factors with Non- communicable diseases (NCDs) such as cardiovascular diseases, cancers, diabetes and respiratory diseases.(4)Tooth decay (dental caries) is the most widespread oral disease worldwide and constitutes a major global public health challenge(5)Dental caries is a multifactorial disease, caused by the interaction between the tooth surface, the bacterial bio film (dental plaque)

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and the presence of sugars from food. The modifiable risk factors for dental caries are obesity, unhealthy diet, particularly one high in sugar, tobacco use, and excessive alcohol consumption. These key risk factors were also shared with most of the other major NCDs.⁽⁶⁾ The studies have shown a significant association between dental caries and obesity among school going children.⁽⁷⁾ Among Indian states Kerala is considered as diabetic capital with higher prevalence. The studies have shown that prevalence of obesity and risk for diabetes among doctors from Kerala was 40% and 53.3% respectively.⁽⁸⁾ Most of the NCDs are manifested among adults of age group 40-50years, but the eating habits and behaviours were developing in the adolescent age group. Hence the present study was undertaken to find out the association between dental caries and risk factors for NCDs among medical students from Palakkad district.

Methodology

A cross-sectional study was done among undergraduate medical students of our institution during the period of June 2018 to September 2019. All available undergraduate MBBS students of our institution during one month period of data collection were included in the study. Those students who had university exams were excluded from the study. Total 554 students of all batches were asked to visit dentistry department in small groups for dental check up whenever they are free. The oral health of each student was examined by a dental specialist using armamentarium used for dental examination and his findings were entered in the proforma. The students were also given a pre-tested self administered questionnaire and were asked to fill this questionnaire. The self-administered questionnaire contain the socio demographic details, risk factors for non-communicable diseases like family history of diabetes mellitus, regular exercises and type of personality. The person was defined as doing regular exercises when he does any moderate intensity exercises for 30-45 minutes/ day for 5 days / week. The investigator also measured weight, height, waist and hip measurement from individual student using a measuring tape, weighing machine and stadiometer. Body Mass Index (BMI) was calculated by measuring body weight in kilograms (kg) by digital scale nearest to 0.1 kg divided by square of the body height which is measured by commercial stadiometer to the nearest 0.1cm in meter square (m²). The Waist Hip ratio was

measured by measuring waist circumference with the help of measuring tape midway between lower border of rib cage and the iliac crest and hip circumference was measured by measuring tape around the point with the maximum circumference over the buttocks. The BMI was calculated and WHO Asian classification is used for analysis. The waist hip ratio was calculated by dividing waist measurement with hip measurement and for females >0.85 and for males >1 is considered as high risk. The data was coded and entered in micro soft excel and statistical software SPSS version 20 was used for analysis. The institutional ethical clearance was obtained.

Results

Out of total 554 undergraduate medical students, more than half 361 (65.2%) of students were females and 193 (34.8%) were males. The mean age was 20.49 + 1.36 ranging from 17 to maximum age 25. Majority of them 531 (95.8%) were staying in the college hostel and only 23 (4.2%) were staying outside. Most of the students 481(86.8%) of them were coming from nuclear family, 59 (10.6%) were from three generation family and 14 (2.5%) were from joint family. The dental specialist had found out that dental caries was present among 428 (77.3%) of undergraduate medical students. Out of 428 students with dental caries, about 65% of students had at least one caries teeth and 35% had two or more caries tooth. Figure: 1.

Out of total 554 medical students majority 524 (94.6%) were taking mixed diet and only 30 (5.4%) of them were vegetarians. More than half 377(68.1%) of them were doing regular exercises and 177 (31.9%) were not doing any regular exercises. Only 48 (8.7%) of them were considered as Type A personality and others 506 (91.3%) were normal personality. Out of 554 medical students more than half of them 363 (65.5%) had no history diabetes mellitus among their parents, 160 (28.9%) of them had history of diabetes among one parent and only 31 (5.6%) of them had history of both parents diabetes. The mean weight of students was 59.15 + 11.51 ranging minimum from 34 kg to maximum 103 Kg. The mean height was 163.58 + 9.08 ranging from 140 cm to 190 cm. The mean waist measurement was 78.97 + 13.13 ranging from 57 cm to maximum up to 115 cm. The mean hip measurement was 90.08 + 8.62

minimum from 62cm to maximum 116 cm. The BMI classification of medical students were given in the Figure: 2 Out of total medical students, 249 (44.9%) of them were categorized as high risk for waist rip ratio and 305 (55.1%) of them had lower risk for waist hip ratio. The gender distribution for BMI classification and waist hip ratio was given in Table: 1

There was statistically significant association between dental caries and BMI. (p value – 0.001) . Out of total 249 medical students with higher waist hip ratio majority 216 (86.7%) of them had dental caries and out of 305 students with low risk of waist hip ratio 93

(30.5%) of them had healthy teeth. This difference was also statistically significant. (p value - <0.001) Among 48 medical students with type A personality, majority 37 (77.1%) of them had dental caries. Out of 31 students with both parents with diabetes mellitus majority 27(87.1%) of them had dental caries. But these differences were not statistically significant. The other risk factors for NCDs like intake of alcohol and smoking history were not obtained from this study, since all students in their self administered questionnaire written they have no such addictions. The association between dental caries and risk factors for NCD was given in Table: 2

Illustrations:

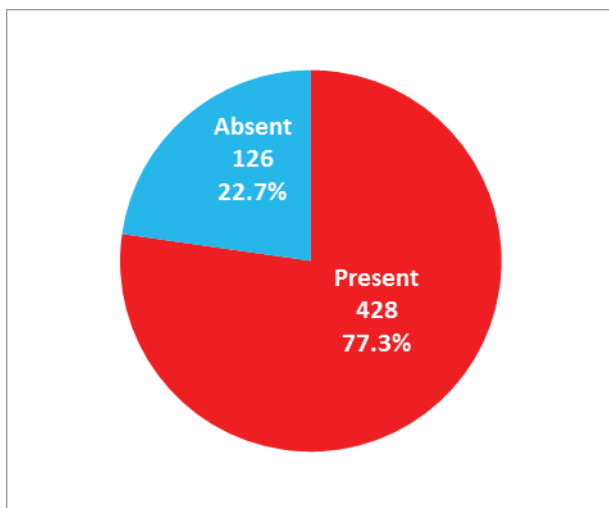


Figure: 1Prevalence of dental caries among undergraduate medical students

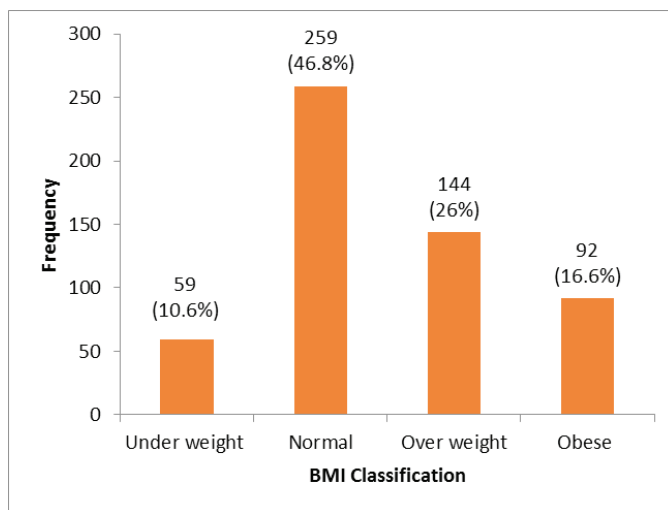


Table: 1 The gender distribution of BMI and waist hip ratio of undergraduate medical students

Parameter	Classification	Male N - 193	Percentage	Female N- 361	Percentage
BMI	Underweight	12	6.2%	47	13%
	Normal	78	40.4%	181	50.1%
	Overweight	56	29%	88	24.4%
	Obese	47	24.4%	45	12.5%
Waist hip ratio	High risk	71	36.8%	178	49.3%
	Low risk	122	63.2%	183	50.7%

Table: 2 Association between dental caries and risk factors for NCD

Parameter	Classification	Dental caries		Total	Statistical significance
		Present N- 428	Absent N- 126		
BMI	Under weight	45 (76.3%)	14 (23.7%)	59 (100%)	Chi- square value- 15.65 P Value -0.001
	Normal	182 (70.3%)	77 (29.7%)	259 (100%)	
	Overweight	123 (85.4%)	21 (14.6%)	144 (100%)	
	Obese	78 (84.8%)	14 (15.2%)	92 (100%)	
Waist hip ratio	High risk	216 (86.7%)	33 (13.3%)	249 (100%)	Chi-square value- 23.18 P value<0.001
	Low risk	212 (69.5%)	93 (30.5%)	305 (100%)	
Regular Physical exercise	Inactive	142 (80.2%)	35 (19.8%)	177 (100%)	Chi-square value- 1.305 P value- 0.25
	Active	286 (75.9%)	91 (24.1%)	377 (100%)	
Personality	Type A	37 (77.1%)	11 (22.9%)	48 (100%)	Chi-square value – 0.001 P value – 0.97
	Normal	391 (77.3%)	115 (22.7%)	506 (100%)	
History of diabetes	No history among both parents	280 (77.1%)	83 (22.9%)	363 (100%)	Chi square value – 1.95 P value -0.37
	One parent diabetic	121 (75.6%)	39 (24.4%)	160 (100%)	
	Both parent diabetic	27 (87.1%)	4 (12.9%)	31 (100%)	

Discussion

In this study the prevalence of dental caries among undergraduate medical students was 77.3% and another study done at Russia among medical students showed higher prevalence of 96%⁽⁹⁾. Another study done at New Delhi among adults showed a prevalence of 82.4%.⁽¹⁰⁾ A study done by N Ratnakumari from Kerala showed a prevalence of dental caries as 68.5% among children aged 6 -12 years.⁽¹¹⁾ The prevalence of dental caries among children aged 12 year from Thiruvananthapuram district was 27%.⁽¹²⁾ Another study done at Bangalore showed a lower prevalence of 35.8% among school children.⁽¹³⁾

The present study showed that 177(31.9%) of students were not doing any exercises. Another study done in Kerala revealed that 44% of undergraduate medical students were physically in active.⁽¹⁴⁾ The important risk factors for non- communicable diseases were BMI, waist Hip ratio, lack of exercises and type A personality. It was found that the present study showed a higher prevalence of overweight (26%) and obesity (16.6%) among undergraduate medical students. A study done by Veena showed that 18.5% and 2.64% of medical students were overweight and obese.⁽¹⁵⁾ Another study from Thrissur district showed 16.7% and 10% of medical students were overweight and obese.⁽¹⁴⁾ The prevalence of overweight and obese were higher among male gender, but half of female population (49.3%) were categorized as higher risk for waist hip ratio. Another study done from Gujarat showed that 45.9% of female students had high risk waist hip ratio compared 2.1% of male counterparts.⁽¹⁶⁾

There was statistically significant association between dental caries and body mass index. Similar result was obtained from Central India among school going children of age group 8-13years, where overweight children had higher prevalence of dental caries.⁽⁷⁾ Another study done at Banglour among pre- school children showed that, as the BMI increases there was significant increase in caries teeth.⁽¹⁷⁾ The present study also showed a significant association between waist hip ratio and dental cries. Similar result was obtained from Haryana, where significant association obtained between high waist hip ratio and periodontitis.⁽¹⁸⁾ The prevalence of dental caries among medical students were higher

among physically inactive students, Type A personality and among both parents having diabetes mellitus. But the difference was not statistically significant. Another study from Portugal showed a correlation between physical activity and dental caries.⁽¹⁹⁾ Previous studies had shown a significant association between type 2 diabetes mellitus and dental caries.⁽²⁰⁾ Another study from Gujarat also showed higher prevalence of dental caries among diabetic patients than non diabetic individuals.⁽²¹⁾

Conclusion & Recommendation

The present study showed that 77.3% of medical students were suffering from dental caries. When BMI was assessed it was found that 26% and 16.6% of undergraduate medical students were overweight and obese respectively. About half of medical student's waist hip ratio was in higher risk. The present study also concludes that those students with higher BMI and high risk of waist hip ratio had higher prevalence of dental caries. The presence of dental caries among adolescence and young adults would be a hint for incidence of NCDs in latter life. Since the risk factors are common for dental caries and NCDs a healthy eating habits and lifestyle modification need to be started in all medical colleges.

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A Cbnaat based Study on Rifampicin Resistance in Tuberculosis in East Godavari District

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Abstract

Background: Globally 1.2 million Tuberculosis deaths occurred among HIV negative people and an estimated 251000 deaths occurred among HIV positive people in 2018. TB continues to be a public health threat as about half a million news cases were Rifampicin resistant. CBNAAT offer the prospect of very high sensitivity approaching that of liquid culture for TB diagnosis. It also provides information on drug susceptibility to rifampicin, which is a surrogate marker for identification of MDR TB cases. **Objectives-** 1. To know the magnitude of rifampicin resistance among TB cases. 2. To find out the incidence of TB-HIV co-infection. **Materials & Method:** Monthly Data regarding CBNAAT results during the year 2019 January-December was collected from District Tuberculosis Center (DTC), East Godavari district. **Statistical analysis used:** Data was entered and analyzed in MS-EXCEL. **Results:** A total of 20364 cases were screened for tuberculosis using CBNAAT, out of which 9366 patients were PLHIV (people living with HIV/AIDS). Among all the patients who were screened, 1951(9.6%) were positive for mycobacterium tuberculosis. 93(0.45%) cases were resistant to rifampicin. Among the PLHIV patients, 241(2.6%) were positive for tuberculosis. In those PLHIV cases, 20(0.2%) were resistant to rifampicin suggesting that rifampicin resistance was more common in HIV/AIDS. Among previously treated tuberculosis cases prevalence of rifampicin resistance was 5.1% as compared to 1.5% & 1.8% among newly diagnosed cases & non-responders respectively. **Conclusion:** CBNAAT is an effective tool in the diagnosis of tuberculosis and in identifying drug resistant tuberculosis. In our study drug resistance to rifampicin was more common in PLHIV and also in previously treated tuberculosis patients. By increasing the case detection rate of RR-TB and TB-HIV co-infection cases using CBNAAT as the first line of diagnostic procedure we can be able to treat cases effectively in order to achieve the Sustainable Developmental Goal(SDG) of ending TB by 2025 as committed by Government of India.

Keywords: CBNAAT, Rifampicin resistance, TB-HIV co-infection.

Introduction

Globally eight countries accounted for 2/3rds of TB burden, among which India accounts for 27% followed

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by China 9%. TB continues to be a public health threat. Globally, an estimated 10 million people fell ill with TB in 2018. There were estimated 1.2 million TB deaths among HIV negative people in 2018 and 251000 deaths among HIV positive people. TB affects people of both sexes in all age groups but the highest burden is in men, aged >15 years who accounted for 57% of all TB cases in 2018. Among all TB cases, 8.6% were people living with HIV. In 2018, about half a million news cases were Rifampicin resistant. Globally, 3.4% of new TB cases & 18% of previously treated cases had MDR TB/RR TB. The overall goal of WHO End TB strategy is to end the

global TB epidemic by 2035.¹

Sputum microscopy in TB diagnosis was developed more than 100 years ago, and WHO endorsed rapid molecular tests in the year 2010 for the diagnosis of TB. RNTCP adapted CBNAAT in India in April 2012. It was launched in 2012 as a pilot project in Maharashtra by state Tuberculosis unit. By the end of 2012, under EXPAND_x-TB project, 12 CBNAAT labs were established all over India across different states.² CBNAAT test is now being made available throughout India. CBNAAT is a semi-quantitative nested nucleic acid amplification test based on molecular detection of mutated gene. It is simple, rapid, and cost effective and doesn't require technical expertise. It can be carried out in an automated manner including bacterial lysis, nucleic acid extraction, and amplification and amplicon detection. It can diagnose TB within 2 hours and gives accurate results due to use of disposable closed cartridges preventing cross contamination.³ In settings where resources are limited for facilities like culture DST, CBNAAT is extremely useful, simple and reliable test. Unlike conventional nucleic acid amplification tests (NAATs), CBNAAT MTB/RIF is unique because sample processing and PCR amplification and detection are integrated into a single self-enclosed test unit, the CBNAAT cartridge.⁴ CBNAAT offer the prospect of very high sensitivity approaching that of liquid culture -the current gold standard for TB diagnosis. It also provides information on drug susceptibility to rifampicin, which is a surrogate marker for identification of MDR TB cases. It is fully integrated and automated amplification and detection using real time PCR. It is a highly specific test as it uses 3 specific primers & 5 unique molecular probes to target the *rpo* gene of *M. Tuberculi*, which is the critical gene associated with rifampicin resistance. Being a PCR based method, clinical validation trails done in four distinctly diverse setting have shown that 92.2% of culture positive patients were detected by a single CBNAAT test with a specificity of 99% as compared to sensitivity of a single direct sputum smear of 59.5%.⁵

At the start of 2020 the Central Government of India has renamed the RNTCP as NTEP (National Tuberculosis Elimination Programme)⁶. This implies targeting an 80% reduction in incidence and 90% reduction in mortality (baseline 2015) Union government is committed to achieving the Sustainable Developmental Goal (SDG)

of ending TB by 2025, five years ahead of the global targets.

So, this study was aimed to know the magnitude of rifampicin resistant tuberculosis and TB-HIV co-infection in the East Godavari district based on the CBNAAT investigation results.

Objectives-

1. To know the magnitude of rifampicin resistance among TB cases.
2. To find out the incidence of TB-HIV coinfection.

Materials & Method

CBNAAT results during year January 2019-December 2019 were collected from District Tuberculosis Center (DTC), East Godavari district monthly with prior permission from District Tuberculosis Officer (DTCO). Six CBNAAT machines manufactured by Cepheid, endorsed by WHO are present in 4 different areas of the district (2 at Kakinada, 2 in Rajahmundry, 1 in Amalapuram and 1 in Rampachodavaram area). All presumptive TB cases, presumptive DR TB, paediatric cases, PLHIV, extra pulmonary TB cases were subjected to CBNAAT as first line of diagnostic investigation. Results of CBNAAT are interpreted as a) MTB not detected, b) MTB detected RIF sensitive, c) MTB detected RIF resistant, d) MTB detected & RIF indeterminate, e) invalid and f) errors among various categories of patients. When the test result is RIF resistance positive then the sample is sent to Regional DST (Drug susceptibility testing centre) at Visakhapatnam, for repeating CBNAAT and also line probe assay (LPA). The data for the above categories was entered and analyzed in MS-EXCEL. Ethical approval was taken from the Institutional Ethics Committee.

Results

A total of 20,364 patients were tested with CBNAAT from 1st January, 2019 to 31st December, 2019 in the East Godavari district, Andhra Pradesh. Out of 20,364 cases 15857 (77.9%) were presumptive TB cases, 801 (4%) of extra pulmonary cases and 678 (3.3%) were presumptive drug resistant cases. 1929 (9.4%) of cases were referred from private hospitals (table 1).

Among the patients who are being treated for tuberculosis under DTC, 89.4% are above 18 years of age and 65.4% of them are males. 10.6% are below 18 years of age and 54.2% of them are females. (figure 1)

Place wise distribution shows that 41.8% of patients belong to Rajahmundry area followed by Kakinada(25.6%), Amalapuram(24.2%) and Rampachodavaram(8.4%). Mycobacterium tuberculosis was detected among 1951(9.6%) cases who were tested in the entire district. Out of those, the drug sensitive tuberculosis cases accounts for 1822(93.5%) followed by 93(4.7%) Rifampicin resistant cases and 36(1.8%) indeterminate rifampicin resistance cases. Among those 93 drug resistant cases, more than half of the cases(47) were from Rajahmundry area followed by 26 cases from Kakinada, 10 cases from Amalapuram and 10 cases from Rampachodavaram.(table 2)

Among 678(3.3%) presumptive drug resistant TB cases, Rifampicin resistance was detected among 12 cases(1.76%), out of which 6(50%) cases were new TB patients at the time of diagnosis, followed by 4 cases of follow up positive & non respondents category and 2 cases were previously treated TB patients. Rifampicin resistance was found to be 1.5% among new tuberculosis cases whereas in previously treated cases and non-

responders it was 5.1% and 1.8% respectively. (table 3)

Out of 15857(77.5%) Presumptive TB cases, 9366(59%) patients were living with HIV/AIDS(PLWHA), 625(4%) were pediatric cases and others includes 5866(37%) of cases. In the PLWHA cases, Mycobacterium tuberculosis was detected among 241(2.6%) cases. Out of which 0.2% were Rifampicin resistant tuberculosis cases. Among 625 paediatric cases tested with CBNAAT, 10(1.6%) cases were positive for mycobacterium tuberculosis and rifampicin sensitive. (table 4)

There were 1929(9.4%) presumptive tuberculosis cases which were referred from private hospitals to District Tuberculosis Center (DTC). Among those 322(16.7%) were positive for Mycobacterium tuberculosis, out of which 309(16%) were Rifampicin sensitive and 13(0.7%) cases were Rifampicin resistant. (figure 2)

Among 801(4%) Extra pulmonary tuberculosis cases tested with CBNAAT, 67(8.4%) cases were positive for Mycobacterium tuberculosis, out of which 64(8%) were Rifampicin sensitive and 3(0.4%) were Rifampicin resistant. (figure 2)

Table 1: Distribution of CBNAAT results among various categories in the East Godavari district

Category	n(%)
Presumptive Tuberculosis cases	15857(77.9%)
Presumptive Drug resistant Tuberculosis cases	678(3.3%)
Referrals from private hospitals	1929(9.4%)
Extra pulmonary TB cases	801(4%)
Indeterminate results	36(0.2%)
Invalid results	26(0.1%)
No results	435(2.1%)
Errors	602(3%)
Total	20364

Table 2: Distribution of CBNAAT results in different areas of East Godavari district

Result	Kakinada	Amalapuram	Rajahmundry	Rampachodavaram	Total
MTB Negative	4280(24.6%)	4445(25.7%)	7413(42.7%)	1212(7%)	17350 (85.2%)
MTB Positive R/F sensitive	558(30.6%)	245(13.5%)	821(45%)	198(10.9%)	1822 (8.95%)
MTB Positive R/F resistant	26(27.9%)	10(10.8%)	47(50.5%)	10(10.8%)	93 (0.45%)
MTB with R/F indeterminate	12(33.3%)	11(30.6%)	13(36.1%)	0	36 (0.2%)
Invalid	9(34.7%)	5(19.2%)	12(46.1%)	0	26 (0.13%)
No results	131(30.1%)	88(20.2%)	23(5.3%)	193(44.4%)	435 (2.13%)
Errors	196(32.5%)	130(21.6%)	201(33.5%)	75(12.4%)	602 (2.94%)
Total	5235(25.6%)	4956(24.2%)	8553(41.8%)	1710(8.4%)	20364

Table 3: Distribution of CBNAAT results of presumptive Drug resistant Tuberculosis cases

Presumptive DR TB	MTB not detected	MTB detected R/F sensitive	MTB detected R/F resistant	Total
New TB patients at the time of Diagnosis	122(29.9%)	280(68.6%)	6(1.5%)	408 (60.2%)
Previous treated TB patients	23(59%)	14(35.9%)	2(5.1%)	39 (5.8%)
Others- follow up positive & non responders	206(89.1%)	21(9.1%)	4(1.8%)	231 (34%)
Total	351(51.8%)	315(46.4%)	12(1.8%)	678

Table 4: Distribution of CBNAAT results of presumptive Tuberculosis cases

Presumptive TB cases	MTB not detected	MTB detected R/F sensitive	MTB detected R/F resistant	Total
PLHIV	9125(97.4%)	221(2.4%)	20(0.2%)	9366 (59%)
Paediatric	615(98.4%)	10(1.6%)	0	625 (4%)
Others	4918(83.83%)	903(15.39%)	45(0.76%)	5866 (37%)
Total	14658(92.43%)	1134(7.15%)	65(0.4%)	15857

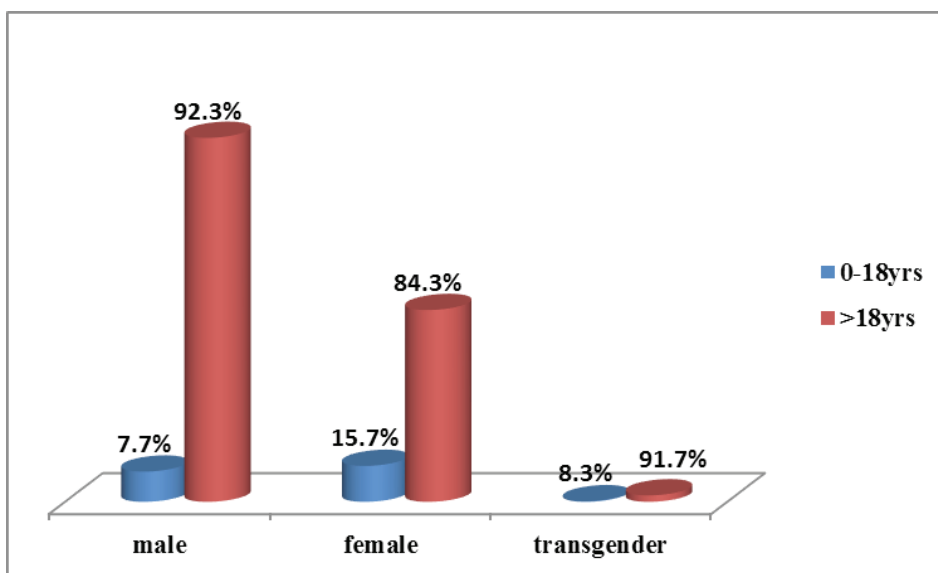


Figure 1: Age wise and gender wise distribution of patients taking tuberculosis treatment from the DTC

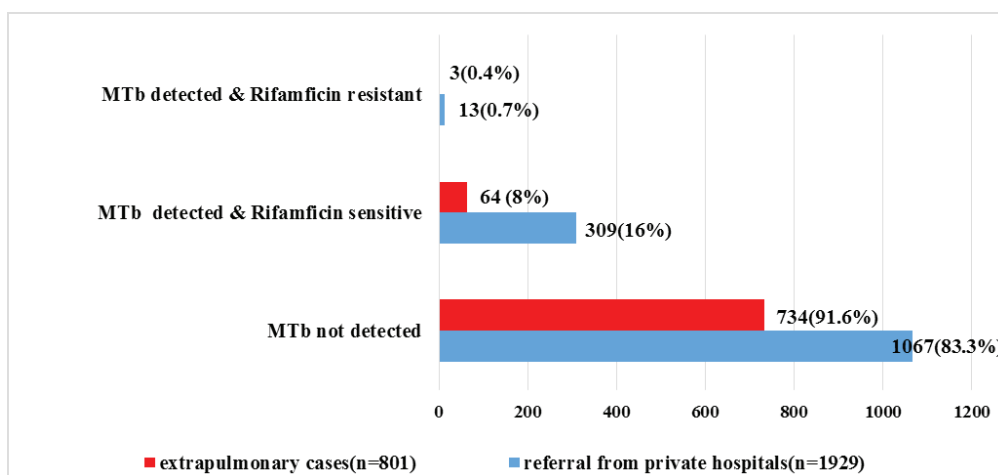


Figure 2: Distribution of CBNAAT results among cases referred from private hospitals (n=1929) and Extrapulmonary Tuberculosis suspect cases(n=801)

Discussion

Males account for 65.4% of those being treated for TB in above 18 years of age. This is similar to the study done by Patel et al⁷ in Ahmedabad and Global TB Report 2019.¹

According to Indian TB Report 2019, India accounts for 8.4% of Rifampicin resistant TB cases & Andhra Pradesh account for 5.7% Rifampicin resistant TB cases.⁸ However in our study rifampicin resistant mycobacterium tuberculosis in the East Godavari district was 4.7%. In the study conducted by Patel et al on the role of CBNAAT in the diagnosis of new pulmonary TB cases in Ahmedabad,⁷ Rifampicin resistance was found to be 4.5% and in another study done by Bansal SK et al in DRTB centre of Faridkot it was around 6%.⁹ Among the newly diagnosed tuberculosis cases, the rifampicin resistance was found to be 1.5%, whereas it was two times of our finding (3%) in the study done by Chandrasekran et al among the patients attending an Urban District Tuberculosis centre.¹⁰ In our study among the previously treated tuberculosis (relapse) cases rifampicin resistance was found to be 5.1% unlike in Shanta et al study, where 17% of cases of relapse showed resistance to rifampicin.¹¹ Among paediatric cases tested with CBNAAT, 1.6% cases were positive for mycobacterium tuberculosis and rifampicin sensitive. No drug resistant cases were detected among pediatric cases. Country statistics is 9% of the TB cases were pediatric cases among which rifampicin resistance was 14% and in Andhra Pradesh 4% of TB cases were pediatric cases out of which rifampicin resistance was 9%.

In our study TB-HIV co-infection, was 2.5% which was similar to the study done by Deepak Arora et al,¹² whereas according to India TB report 2019,⁷ it was 3.4% in the country and 8% in the state of Andhra Pradesh but, in the study conducted in AIIMS-New Delhi by Sharma SK et al, the TB-HIV co-infection was very high(33.2%).¹³

Among the Extrapulmonary TB cases, Mycobacterium tuberculosis was detected among 8.4% of cases, where as in the study done by Kasat S et al on the effectiveness of CBNAAT in the diagnosis of the Extrapulmonary Tuberculosis it was 15% (25 out of 166 cases).¹⁴ According to Indian TB Report 2019,

out of total cases on treatment for TB 14.7% were extra pulmonary cases. Study done by Sharma et al in diagnosing EPTB by GeneXpert has shown an overall sensitivity of 71%.¹⁵

Conclusion

In this rapidly evolving era of TB and HIV co-infection, updated knowledge and changing research priorities, with respect to new TB diagnostic procedure is the need of the hour. Rifampicin resistance was found to be 1.5% among new tuberculosis case whereas in previously treated cases and non-responders it was 5.1% and 1.8% respectively. As the result is available in less than 2h and hence the screening capacity of healthcare centre can be increased. Use of CBNAAT has significantly increased TB finding and it has also significantly increased MDR case finding and it is cost effective when compared to culture and DST. It can be operated with minimally trained staff and least biosafety concerns. But every packaged deal has its own share of negativities like device maintenance and annual calibration of instrument is required along with constant power supply, which may pose some problems in remote areas. So by increasing the case detection we can treat more number of TB cases effectively with clear distinction between drug sensitive and resistant cases.

Recommendation-

The case detection rate of Tuberculosis and MDR-TB case finding can be increased by providing CBNAAT machines to Designated Microscopy Centers and Primary Health Centres, which is rapid, cost effective and doesn't require technical expertise when compared to smear microscopy.

Limitation of the Study-

The tuberculosis cases which were diagnosed by other investigation methods were not included in the study.

Conflicts of Interest: *None declared*

Source of Funding: *Nil*

Ethical Clearence *was taken from the institutional ethics committee*

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Dementia, A General Medical Practitioner's Concern: A Review

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Abstract

The senile population is often ignored by society without heeding to their actual complaints; their medical management is carried superficially. It is inevitable for the growing population and increased lifespan to pose the threats of psychosomatic discomforts of advancing age, where early clinical recognition of conditions like dementia will play an important role. Dementia requires keen scrutiny by the general practitioners, they need to give utmost importance and attention. The medical practitioner will play an important role in identifying the clinical condition like dementia during its initial stage itself. From the point of general practice, it will become important to convince the patient and his family members to handle the situation by referring to a psychiatrist or psychologist or a rehabilitation center for the needful. Hence this article will review some basics of Alzheimer's disease (AD) especially from the point of the fraternity of general medical practitioners in the society.

Keywords: *Alzheimer's disease, Dementia, Psychiatrist, Psychologist, Psychosomatic.*

Introduction

Dementia and depression are two major problems among the senile population in society. **Dementia** is a syndrome presented with deterioration in memory, thinking, behavior, and the ability to perform day-to-day activities. **Depression** is a severe feeling of despondency and dejection¹. Alzheimer's disease stands as one of the leading causes of death due to dementia, especially in western countries. Dementia increases with age; it is invariably associated with some degree of cognitive decline. There is a lot of similarity between these two conditions. Dementia starts with mild cognitive impairment (MCI); it is a progressive declining change in cognitive function with an increased disability of self-management by an individual. It will progress from mild to moderate, and then to advanced stages; it may be difficult to identify during its initial stages. Alzheimer's disease (AD) is a leading cause of dementia among elderly citizens in the world. Dr. Alois Alzheimer has first recognized this condition of irreversible neurodegenerative disorder in the year 1907 in a female patient aged 51 years old; hence fourth it was known as Alzheimer's Disease². Its etiology is multifactorial showing dominance of gene and sporadic

nature of the disease. Subtle pathophysiological changes in AD sets in 10-15 years before its insidious clinical manifestations; hence one should be keen while dealing with the complaints of senior citizens.

Types of Dementia: Alzheimer's Dementia, Vascular dementia, Lewy body dementia (LBD), Frontotemporal Dementia (FTD).

Alzheimer's Disease (AD): is a syndrome with degenerative changes in the brain, manifested with insidious onset with a progressive decline in cognitive, emotional, and motor functions.

Vascular Dementia: it is seen as a result of a deformity in blood vessels due to various underlying factors like diabetes, hypertension, dyslipidemia, etc. affecting brain perfusion which is gradually leading to brain parenchymal changes at the different regions³.

Lewy Body Dementia (LBD): it is due to abnormal deposits of an alpha-synuclein protein called "Lewy Bodies" inside the neuron; which is manifested with inconsistent cognitive dysfunction⁴.

Frontotemporal dementia (FTD): it is due to the involvement of the frontal and temporal lobes of the

brain associated with neurocognitive behavior changes⁵.

Role of Neurotransmitters: The neurotransmitters will play an important role in cognitive function. The activity of the brain is driven through several neurotransmitter chemicals like cholinergic, glutaminergic, adrenergic, serotonergic, dopaminergic fibers, they play an important role in individuals' psychosomatic excellence. With the advancing age, low-profile neuronal activity is seen in the cerebral cortex of the brain, it results in cognitive dysfunction with gradual synaptic functional impairment followed by loss of neurons in the patients with AD⁶.

Neurotransmitters will play an important role in motor function; it maintains one's alertness and wakefulness. Declining cognitive ability is an important sign of AD, associated with dysfunction in neurotransmitter secretion. Acetylcholine (ACh) has a crucial role in both the central and peripheral nervous system; it is used in the neuromuscular junction to activate skeletal muscles. The cholinergic hypothesis underscores the events of reduced ACh uptake, ACh release, uptake of choline acetyltransferase. Due to impaired secretion of ACh causing synaptic loss of cholinergic neurons is an important event leading to progressive motor and cognitive impairment. The drugs which are enhancing the activity of the cholinergic system has therapeutic implications to treat AD patients^{7,8}. Glutamate is another excitatory neurotransmitter of the nervous system, transmitted through glutaminergic fibers. If there is over activation of N-Methyl-d-Aspartate (NMDA) receptors by glutamate leading to the reduced neuronal activity which results in excitotoxicity and neuronal loss in AD⁹. Serotonin is another neurotransmitter; which contributes to the sense of wellbeing and happiness in an individual. Excessive serotonergic(5-Hydroxytryptamine) denervation is observed in AD. These patients may experience severe sleep and circadian rhythm disturbances with emotional behavior. Serotonin reuptake inhibitors are playing an important role; hence reinstating serotonergic neurotransmission has an important therapeutic value¹⁰.

Pathophysiology of Alzheimer's

EOAD (Early onset of Alzheimer's disease)

EOAD is seen in families with autosomal dominant

genetic inheritance; its early-onset age ranges from 30-65 years. The dominant genes which are linked with the familial autosomal inheritance of EOAD are including amyloid precursor protein (APP) on chromosome 21q, PSEL1(presenilin) on chromosome14 and PSEL2(presenilin) on chromosome1. APP is functionally involved in neuronal plasticity and synapse formation. Recently through genome-wide association studies, a greater number of genes identified, which are showing high penetrability in EOAD^{11,12}.

APP is a substrate of the γ -secretase enzyme complex which is involved in its cleavage process. The amyloid cascade hypothesis proposes that there is a progressive accumulation of β -amyloid protein in the brain. APP cleavage occurs by the process of proteolysis through amyloidogenic and nonamyloidogenic pathways by the action of gamma-secretase complex; it contains individual proteins presenilin-1, presenilin-2, nicastrin, and APH-1 (anterior pharynx defective-1). APP cleavage by α -secretase and γ -secretase enzymes results in the formation of nonharmful fragments that are undergoing easy degradation hence called the nonamyloidogenic pathway. APP cleavage by γ -secretase and β -secretase occurs through the amyloidogenic pathway results in the formation of β -amyloid formation which is not undergoing degradation easily; it results in β -amyloid stagnation and decreased clearance. This results in amyloid senile plaques accumulation in the brain parenchyma; this extracellular debris deposited outside the neuron, which initiates the inflammatory reactions. There is an association between a mutation in the APP gene or any one component of γ -secretase complex expression that can cause excess formation and aggregation of β -amyloid, leading to its undue deposition in the brain^{13,14,15}.

PSEN 1 protein is a component of the γ -secretase complex which deals with the APP cleavage process, its mutation in the complex deals with the EOAD by causing the disproportion in the formation of amyloid- β (Ab) ratio Ab42/Ab40. Three proteases enzymes cleavage the APP is alpha, beta, and gamma-secretase enzymes play a role in the etiology of AD. Beta-amyloid peptides are created in two forms, one is made up of 40 amino acids and another by 42 amino acid peptides. There is a selectively increased production of Ab42 monomer levels in the brain. The elevated ratio of beta-amyloid 40

and 42 is an important event in early pathological changes seen in the AD. Curbing the β -amyloid 42 productions and maintaining its concentration is having therapeutic value. PSEN2 gene functionally resembles the PSEN1 is also one the main component in the gamma secretory complex having relatively rare and less influence on EOAD^{16,17,18,19}.

Down Syndrome (DS) is an autosomal genetic disorder having an extra copy (trisomy) of chromosome 21. It is interesting to note this extra copy of chromosome 21 (trisomy) is the housing APP gene. Due to this extra copy of APP leads to excess formation of β -amyloid peptide formation²⁰. This condition is also associated with deranged microglial cells with neurofibrillary tangle formation. DS patients are also having high-level production of Reactive Oxygen Species (ROS) causing overall oxidative stress in the body; it affects the improper scavenging of β -amyloid which accelerates the pathophysiological changes in the brain; hence Down syndrome patients are prone for early onset of AD^{21,22}.

LOAD (Late-onset of Alzheimer's disease)

LOAD is sporadic, can be seen in the prone elderly population usually after 65 years of age. There is growing evidence of heterogeneity of LOAD involving both genetic and environmental risk factors. Apolipoprotein E (ApoE) is a type of protein involved in lipid homeostasis; it is a major cholesterol transporter that plays an important role. It helps in repairing the neuronal injury, maintain synaptic integrity, neuronal plasticity, neurogenesis, synaptic transport, cholesterol metabolism, etc. ApoE gene codes for apolipoprotein is located on chromosome 19, it helps in the clearance of accumulated beta-amyloid. It has three different isoforms ApoE ϵ 2, ApoE ϵ 3, and ApoE ϵ 4. ApoE ϵ 2 has a protective effect against AD; in contrast, ApoE ϵ 4 quantity will increase the risk of AD, hence taming ApoE ϵ 4 is having high therapeutic importance. Much association of dementia in a family is seen in an Individual who carries two APOE ϵ 4 alleles; gender-wise the females are relatively more prone to AD when compared with males. APOE also influences the susceptibility of the body towards bacterial or viral infections. APOE ϵ 4 causes the subtle brain changes posing the lifelong risk associated with late risk of AD^{23,24,25}. Inherent ApoE ϵ 4 allele of the APOE gene from parents is a greater risk factor for AD,

it was the first clinically correlated gene involved in late-onset of AD. Later it was also found its correlation with early onset of AD. ApoE is also expressed in different tissues of our body; found abundantly in the brain tissue. Altered APOE gene expression in glial cells may be one of the factors influencing the pathophysiological changes in the brain^{26,27}. ApoE ϵ 4 is mediating the Alzheimer's risk, which affects the astrocytes and microglial cells supporting proinflammatory influence, and decreased phagocytic capacity leading to neurodegeneration²⁸.

Role of Genetics in Twins: Studies showing improper disease concordance in monozygotic (MZ) and dizygotic (DZ) twins. It is showing discrimination in age onset of disease and clinical manifestation. Discordance depends on environmental risk exposure, and influence by lifestyle factors; hence there is no such similarity exists among these two comparable groups. The inter pair differences in the age of onset of disease were significantly greater among dizygotic pairs when compared with monozygotic pairs. These findings are showing the difference in individual gene expressions probably associated with the host and environmental interactions²⁹.

Tauopathies: Tau is a microtubule-associated protein (MAP) found in the cytosol and axon of the neuron. Tau protein is doing the function of building the integration of microtubule inside the cell, they help in axonal transport. Tauopathies are a group of disorders where there is an abnormal filamentous protein formation in the neurons, oligodendrocytes, astrocytes, etc. Its gene represented on chromosome 17 q21; gene mutations affecting the formation of normal tau proteins results in the disorganization of structural microtubules of the cytoskeleton, gradually leading to reduced neuronal plasticity, nerve conduction, synaptic transmission, etc. Hyperphosphorylation of tau is causing disorganization and self assembles of microtubules resulting in the formation of neurofibrillary tangles (NFT) in the brain, it is toxic to the neurons. Higher levels of tau in the CSF are showing detrimental effects in an individual when it is associated particularly with the ApoE ϵ 4 genotype. Hence hyperphosphorylated tau is one of the important biomarkers seen in the CSF having a high diagnostic value in Alzheimer's disease. Similar metabolic changes are also seen in frontotemporal dementia in Parkinson's disease (FTDP). Tauopathies are not only

restricted to dementia, but aberrant tau proteins are also seen in several neurological diseases with cognitive dysfunctions including patients with Type 1 Diabetes Mellitus. Amyloid plaques and Neurofibrillary tangles in the brain are considered as the “Hallmarks” of the Alzheimer’s disease^{30,31,32}.

Dealing with Alzheimer’s disease

History of illness and family history of dementia patients plays an important role in diagnosis at the early stage. Primary prevention includes reducing the incidence of dementia. Secondary prevention includes early detection of the condition before its explicit manifestations. Tertiary prevention includes early diagnosis and treatment initiation³³. It is also important to convince the family members and caregivers to handle the worst scenarios. Even counseling the patient and patient family members play an important role.

Clinical Examination in Dementia: The physician will play an important role in making use of an appropriate tool to examine the patients clinically. The mental status examination is mainly intended to probe the cognitive domain. Mini-mental state examination (MMSE) is a widely used clinical psychometric evaluation method intended to assess the cognitive levels; used for diagnostic, prognostic, and severity confirmation of dementia disorders. MMSE assesses the domains like attention, language, memory, orientation, visual and spatial proficiency. This test with the maximum assigned score is 30. The lower score indicates increased severity of the cognitive disability; score 24 is an indication of normal cognitive ability. The mental examination is useful to elucidate the difference between neurological and psychiatric disorders of the variable range^{34,35}.

Structural changes in Brain: Being the most susceptible organ, the brain shows senile degenerative changes in its different regions. Hippocampus, amygdala, entorhinal cortex, parahippocampal regions of the brain showing architectural changes in individuals with AD. The hippocampus is a site of memory, showing more significant degenerative changes. On gross anatomical examination of the brain was showing cortical thinning, narrow gyri; sulci which are a space between the adjacent gyrus will be increased considerably. Undergoing brain degeneration can be correlated with an increase in the size of the ventricles of the brain. Microscopic

examination is revealing the neuronal loss which is seen along with gross degenerative brain changes of Alzheimer’s disease^{36,37}.

Radiology investigations: Advances in neuroimaging biomarkers will play an important role in early recognition of clinicopathological stage progression in dementia. It also helps to exclude the etiology of the nondegenerative neurological deficits, these investigational findings should be always used in conjugation with clinical findings. The prime goal of biomedical research is to establish an affordable and non-invasive biomarker at the preclinical stage of AD. These biomarkers are used as surrogates for the disease progress at different ages through neuroimaging techniques. It helps in understanding the alteration in the structure and volume of the brain. There is several advanced non-invasive neuro-imaging clinical equipment, like Amyloid PET (Positron Emission Tomography), Tau PET, activated fMRI, resting-state fMRI, diffusion MRI, structural MRI, etc. These radiological procedures are specific to find changes like an amyloid deposition, hyperphosphorylated tau protein; and also to find changes in white matter, cortical grey thickness, hippocampus, etc. MRI images are fair to show some early structural and volumetric changes in different parts of the brain in AD patients. These biomarkers are having diagnostic and prognostic importance^{38,39}.

Laboratory findings: Though our knowledge of genomics and proteomics has created large opportunities to explore into the disease-specific molecular marker identification; however, the common circulatory biomarkers like beta-amyloid, tau proteins, phosphorylated tau in CSF are considered as most appropriate and important in disease staging and confirmation of Alzheimer’s dementia⁴⁰.

Treatment and future scope: The neurodegenerative changes in Alzheimer’s disease are irreversible, hence as such, there is no cure for this ailment. Presently existing modern treatment of Alzheimer’s dementia can’t stop the disease progress. The basic pharmacological line of treatment includes drugs like cholinesterase inhibitors and memantine, they can reduce the symptomatic cognitive and functional decline⁴¹. The non-pharmacological treatment includes psychological support by caregivers, and the enriched

sociocultural environment will help. There is a lot of scope for the holistic treatment approach for this ailment. There are large opportunities for research especially in the field of application of nootropic herbal agents in dementia syndrome. Among several modifying factors, a healthy diet, exercise, lifestyle modification, and practicing yoga may be having an advantage in delaying the disease onset.

Conclusion

Alzheimer's dementia is the most important medical and social problem of age advanced senior citizens, hence its prevalence is estimated to rise in society. Early identification of clinical symptoms of dementia before its explicit manifestation is crucial. The fraternity of general medical practitioners are playing an important role, they act as bonding between patients, family members, and caretakers. The dementia is recognized as a public priority; increasing awareness, and establishing dementia-friendly initiatives in the society and early initiation of treatment can lessen the socioeconomic burden on the country.

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Risk of Malignancy Index (RMI-2) in the Evaluation of Adenexal Masses

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Abstract

The present prospective study, conducted in the department of Obstetrics and Gynaecology and department of Biochemistry, Government Medical College and Rajindra Hospital, Patiala. Fifty patients after taking a detailed history and examination underwent various investigations including CA-125 levels and ultrasonography. RMI-2 was calculated for each patient preoperatively and later compared with respective histopathological examination. The present study demonstrated that RMI-2 (at a cut-off value of 200) is a screening method with high sensitivity and specificity in predicting benign or malignant nature of adenexal masses. It is a simple, easy and useful method to apply in a tertiary care hospital. Our study reconfirms accuracy of RMI in diagnosing adenexal masses with high risk of malignancy. Small sample size, more number of pre-menopausal and more number of benign ovarian masses were some of the limitations of present study.

Keywords- RMI-2, Ovarian malignancy, CA-125, U-Score, Menopausal.

Introduction

Over the years, many parameters have been evaluated to assess the risk factors like age, menopausal status, family history, size of tumor, hormonal assay and immunological study¹

With the introduction of imaging modalities including transabdominal and vaginal ultrasonography,^[2] doppler color scans and MRI, more characterization of the internal structure of the mass (i.e. wall complexity, mass contents) is possible. In addition to clinical examination the above modalities aid in diagnosis.

Transvaginal or transabdominal ultrasound examination is recommended as part of the initial workup

of a complex adenexal / ovarian mass. Ultrasound reports should be standardized to include size, unilateral / bilateral, location of the adenexal mass, its possible origin, thickness of septations, presence of excrescences, presence of internal solid components, vascular flow distribution pattern, and presence or absence of ascites. CA 125 antigen is the most extensively studied serum marker for distinguishing benign from malignant pelvic masses^[3].

Differentiation between benign and malignant adenexal masses is central to decision regarding surgical management. Transvaginal or transabdominal ultrasound examination is recommended as a part of the initial workup of a complex adenexal / ovarian mass. CA 125 antigen is the most extensively studied serum marker for distinguishing between benign and malignant pelvic masses³. Ultrasound findings, CA-125 levels with menopausal status is used in calculating the RMI-2 score to identify pelvic mass with high malignant potential.⁴

Present study was conducted with the aim to predict risk of malignancy (RMI-2) in adenexal masses

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preoperatively and compare it with histopathology.

Material and Methods

The present prospective, observational, and clinical study was conducted in Department of Obstetrics and Gynaecology, Rajindra Hospital, Patiala. The study was conducted from January 2016 to December 2016 on a total of 50 patients with adenexal masses admitted in Department of Obstetrics and Gynaecology of Rajindra Hospital Patiala for exploratory laparotomy. Women of all age groups who were willing to participate in the study were included. Patients with adnexal masses with ectopic pregnancy were excluded from the study.

A detailed history regarding the nature, progression, and duration of the presenting symptoms. Specific signs and symptoms suggestive of an underlying malignancy such as pelvic / abdominal pain, urinary urgency / frequency, increased abdominal size / bloating, and difficulty in eating / feeling full were specifically sought, especially when these symptoms were persistent (present for <1 year and occurred >12 days per month). Any significant family history of neoplasia, such as breast, ovarian, endometrial, colorectal, and pancreatic carcinoma was noted. All routine and special investigations were done. Transvaginal and transabdominal ultrasonography wherever required was done for size, loculation, bilaterality, presence of solid components, ascites and intra-abdominal metastasis were noted. Serum CA-125 was done in Department of Biochemistry via ELISA. Expected normal CA-125 value was defined as <35 U/ml. RMI was calculated for each patient.

For our study RMI-2 Scoring system was used and calculated for each patient using formula:

$$\text{RMI-2} = (\text{U}) \times (\text{M}) \times (\text{CA-125})$$

Ultrasound scans were scored as one point for each of the following characteristics: multilocular cysts, evidence of solid areas, evidence of metastasis, presence

of ascites, bilateral lesions, using the scoring system. The total ultrasonography score of 0 or 1 gave U=1, and a score of 2 gave U=4. If < 1 feature then U=1 if > 1 feature then U=4. The score of premenopausal status M=1 and for postmenopausal status M=4.

Postmenopausal status was defined as no menstruation for more than one year or surgical menopause. The serum levels of CA-125 were taken in U/ml and levels of 35 or more were considered to be normal.

The cut-off levels for RMI-2 Score was taken as 200 for our study group. Patients having adenexal mass with RMI-2 <200 were labelled as benign and masses with RMI score >200 were labelled as malignant. Statistical analysis were done using SPSS trail system and chi-square “t”-test.

Results

Out of a total of 50 cases with adenexal masses, 11 were malignant and 39 were benign on histopathology. Table no 1 shows that benign tumors were more common in the present study i.e. 39 (78.0%) in number. Benign serous cystadenoma twelve (24.0%) was the most common benign lesion followed by dermoid cyst eight (16.0%), inflammatory pathology five (10.0%), endometriotic cyst three (6.0%), hemorrhagic cyst, follicular cyst, and serous cyst present in two (4.0%) patients each. Mucinous cystadenoma, fibroma, corpus luteal cyst, benign serous cystadenofibroma and borderline mucinous tumor were present in one (2.0%) patient each. Malignant tumors were present in only eleven (22.0%) patients. Granulosa cell tumor was the most common malignant tumor which was present in four (8.0%) patients followed by dysgerminoma and serous cystadenocarcinoma that were seen in two (4.0%) patients each. Atypical proliferative mucinous tumor, carcinoma ovary and immature teratoma were found in one (2%) patient each Table 1).

TABLE 1: DISTRIBUTION OF BENIGN AND MALIGNANT TUMORS AS PER HISTOPATHOLOGY

Histopathological type	No. of patients	Percentage (%)
1. Benign tumors	39	78.0
Benign serous cystadenoma	12	24.0
Dermoid cyst	8	16.0
Inflammatory pathology	5	10.0
Endometriotic cyst	3	6.0
Haemorrhagic cyst	2	4.0
Follicular cyst	2	4.0
Serous cyst	2	4.0
Mucinous cystadenoma	1	2.0
Fibroma	1	2.0
Corpus luteal cyst	1	2.0
Benign serous cystadenofibroma	1	2.0
Borderline mucinous tumor	1	2.0
2. Malignant tumors	11	22.0
Granulosa cell tumor	4	8.0
Dysgerminoma	2	4.0
Serous cystadenocarcinoma tumor	2	4.0
Atypical proliferative mucinous tumor	1	2.0
Carcinoma ovary	1	2.0
Immature teratoma	1	2.0
Total	50	100

Four (8.0%) patients had pregnancy co-existent with benign adenexal masses out of which two (4%) were serous cystadenoma and one (2%) corpus luteal cyst and inflammatory pathology, each. Among 50 patients with adenexal masses, 39 (78%) were pre-menopausal and 11 (22.0%) patients were post-menopausal. Patients with

M-score 1 were 39 and with M-score 4 were 11. Out of the total benign tumors i.e. 39 (78.0%), M-score 1 was present in 34 (87.2%) patients whereas M-score 4 was seen in five (12.8%) patients. In malignant cases, M-score 1 was present in five (45.4%) patients while six (54.5%) patients had M-score 4. (Table 2)

Table 2: DISTRIBUTION OF AGE, CA-125 Levels, U-score, M-score and RMI-2 in patients with adenexal masses

PARAMETER	MALIGNANT (n=11)	MALIGNANT (100%)	BENIGN (n=39)	BENIGN (n=39)
Age (years)				
≤15	1	9.1	1	2.6
16-30	2	18.2	17	43.6
31-45	3	27.3	14	35.9
46-60	4	36.3	4	10.2
>60	1	9.1	3	7.7
Residential Area				
Rural	3	27.3	20	51.3
Urban	8	72.7	19	48.1
Serum CA-125 levels				
<35 U/ml	4	36.3	18	46.2
>35 U/ml	7	63.7	21	53.8
U-SCORE				
U-1	3	27.2	39	89.7
U-4	8	72.8	4	10.3
M-SCORE				
M-1	5	45.4	34	87.2
M-4	6	54.6	5	12.8
RMI				
<200	3	27.3	37	94.9
>200	8	72.7	2	5.1

Ultrasound features included in U-score suggestive of malignancy were absent in 34% patients and were present in 66% of the patients. All the patients with malignant disease had one or more feature suggestive of malignancy while 56.4% of the benign lesions had either one or more feature on ultrasound and 43.6% had none of the features suggestive of malignancy on ultrasound. The most common feature on ultrasound was presence of solid component in sixteen (32.0%) patients followed by bilateral adenexal masses thirteen (26.0%), multilocular masses eleven (22.0%), ascites six (12.0%) while intra-abdominal metastasis was not found in any of the patient. Out of the 50 patients, majority i.e. 38 (76.0%) of patients had U-SCORE 1 and 12 (24.0%) patients had U-SCORE 4. In the present study, 35 (89.7%) of the total benign tumors had U-score 1 and 4 (10.2%) had U-score 4. In malignant lesions, U-score 4 was present in eight (72.7%) patients and U-score 1 which was seen in three (27.2%) patients only (Table 3).

Table 3-DISTRIBUTION OF ULTRASOUND FINDINGS ACCORDING TO U-SCORE CRITERIA

ULTRASOUND FINDING	NO. OF PATIENTS	PERCENTAGE
Bilateral	7	14
Solid	7	14
Multilocular	7	14
Solid+Ascites	5	10
Bilateral+Solid	2	4

Cont... Table 3-DISTRIBUTION OF ULTRASOUND FINDINGS ACCORDING TO U-SCORE CRITERIA

Bilateral+Multilocular	2	4
Bilateral+Ascites	1	2
Solid+Multilocular	1	2
Bilateral+Solid_Multilocular	1	2
Intra Abdominal metastasis	0	0
Total findings	33	66
No positive ultrasound findings	17	34
Total	50	100

Normal range of CA-125 is 0-35 U/ml. In the present study, 28 (56.0%) patients had CA-125 levels >35 U/ml and 22 (44.0%) had CA-125 levels < 35 U / ml. The mean value of CA-125 levels in the present study was 68.05 ± 140.88 U/ml. Among patients with malignant lesions, four (36.4%) had serum CA-125 levels ≤ 35 U/ml followed by three (27.3%) patients who had CA-125 levels between 36-100 U/ml. Patients having benign lesion on histopathology had 18 (46.2%) patients with serum CA-125 levels <35 U/ml followed by 17 (43.6%) patients having serum CA-125 levels between 36–100 U/ml. Only four (10.3%) patients had CA-125 levels between 101-175 U/ml. None of the patients with benign lesions had CA-125 levels >176 U/ml.(Table 4)

Table 4 :DISTRIBUTION OF PATIENTS ACCORDING TO SERUM CA-125 LEVELS

CA-125 (U/ml)	No.of patients	Percentage(%)
<35	22	44
35-100	20	40
101-175	6	12
>175	2	4
Total	50	100
Mean		68.05+/-140.88

Among patients with malignant disease on histopathology, maximum number i.e five (45.5%) of malignant tumors were found in patients with RMI -2 >300 followed by three (27.3%) patients who had RMI-2 between 201-300. Only two (18.2%) patients had RMI between 101-200 and one (9.1%) patients had RMI-2 ≤ 100 . Maximum number of benign lesions i.e. 30 (76.9%) had RMI-2 <100 followed by seven (17.9%) patients with RMI between 101–200. Only one (2.6%) patients had RMI-2 between 201-300 and >300, each. p-value is highly significant 0.000 (< 0.05). Majority of

benign adenexal lesion i.e. 37 (94.9%) had RMI -2<200 whereas only 2 (5.1%) had RMI-2 >200. RMI-2 >200 was present in majority 8 (72.7%) of the malignant lesions and only 3 (27.3%) malignant lesions had RMI-2 <200.

The sensitivity, specificity, PPV and NPV was calculated for CA-125, M-score, U-score and RMI. As shown in table no 3, in the present study, **CA-125 levels** when taken as <35 U/ml as normal had sensitivity of 63.6 %, specificity of 46.2%, negative predictive value of 81.8% and positive predictive value of 25%

in predicting benign or malignant nature of adenexal masses. p-value of CA-125 in the present study at 35 U/ml is 0.230 which is non-significant. When cut-off value of CA-125 levels was taken as 142.5 U/ml specificity was increased to 94.5% and specificity was decreased to 27.3%. PPV at this cut-off level was 75% and NPV was 82.6%.p-value at 142.5 U/ml was 0.029 which was significant. Significance was increased at 142.5 U/ml then 35 U/ml. Ultrasound score had sensitivity of 72.7%, specificity of 89.7%, PPV of 66.7% and NPV of 92.1% in defining benign or malignant character of adenexal masses. p-value of U-score in the present study is 0.000

which is highly significant. M-score had sensitivity of 54.5%, specificity of 87.2%, PPV of 54.5%, and NPV of 87.2% in predicting benign or malignant nature of adenexal masses. p-value of **M-score** in the present study is 0.008 which is significant. RMI was calculated for all the patients, when 200 was taken as cut-off value for RMI then it had sensitivity of 72.7%, specificity of 94.9%, PPV of 80.0% and NPV of 92.5% in predicting benign or malignant nature of adenexal masses. p-value of RMI in the present study at 200 cut-off value is 0.003 which is significant. (Table 5)

Table 5 : Comparison of sensitivity ,specificity , PPV, NPV and p-value of CA-125 levels, U-score, M-score and RMI -2

PARAMETER	SENSITIVITY(%)	SPECIFICITY(%)	PPV(%)	NPV(%)	p-value
CA-125 levels	63.6	46.2	25.1	81.8	0.230 Non-significant (>0.05)
U-score	72.7	89.7	66.7	92.1	0.000 Highly Significant
M-score	54.5	87.2	54.4	87.2	0.008 significant (<0.05)
RMI	72.7	94.9	80	92.5	0.003 significant (<0.05)

Discussion

About 10% of women undergo exploratory laprotomy for evaluation of ovarian masses during their lifetime. Prompt identification of ovarian malignancies and referral to a gynaeco-oncologist can enhance the patient survival rates but a single method which can accurately predict ovarian malignancy is still unavailable. In the pre-operative assessment of adenexal masses, the major diagnostic tools are still clinical impression and ultrasound examination. However, due to limitation of clinical impression and sonographic findings to predict ovarian malignancy, it is not surprising that Gynaecologists may detect an unexpected ovarian malignancy intra-operatively.^[7]

Serum CA-125 was earlier used as an independent marker for preoperative evaluation. The main limitation of CA-125 is that it may be high in benign disease such as ovarian cysts, endometriosis and pelvic infection. The combination of serum CA-125 with menopausal status, other tumor markers and ultrasound parameters increases the discriminating power of the method for the two types of ovarian pathology.¹

In the present study sensitivity of CA-125 was 63.6%, sensitivity was more than specificity, so this test is screening rather than confirmatory test. The PPV was 25%, PPV was less than NPV 81.8%, so CA-125 levels are not diagnostic to correctly identify the disease.

Serum Ca-125 levels as per present study is a screening tool similar to the previous studies conducted by Abdulrahman GO et al (2014), Aziz AB et al (2015) and Javdekar R et al (2015). The specificity of CA-125 levels was 46.2% in the present study which was different from the previous studies conducted by Abdulrahman GO et al (2014), Aziz AB et al (2015) and Javdekar R et al (2015) with specificity of 67%, 67.6% and 85.3% respectively. This smaller study population size and large number of benign lesions on histopathology in our study.

In the present study, sensitivity of RMI-2 was 72.7% which was similar to the sensitivity of RMI in the previous studies conducted by Tingusled et al (1996), Bouzari Z et al (2011), Insin P et al (2013), Yavuzcam A et al (2013), Abdulrahman GO et al (2014), Yamamoto Y et al [60] (2014) and Javdekar R et al (2015) of 71%, 76%, 71%, 75%, 74%, 81.1% and 70.5% respectively. Sensitivity of RMI was different from Clarke SE et al (2009) study i.e. 91.0%, this may be due to different cut-off values of RMI i.e. 200 in our study and 355 in Clarke SE et al [53] (2009) and from Jacobs et al (1990) as Jacobs used RMI-1 and our study used RMI-2.

The specificity of RMI was 94.9% in the present study which was similar to the previous studies conducted by Jacobs et al (1990) (96.9%), Tingusled et al (1996) (96.0%), Clarke SE et al (2009) (96.0%), Bouzari Z et al (81.0%), Yavuzcam A et al 2013 (85.1%), Yamamoto Y et al (2014) (89.6%) and

Javdekar R et al (2015) (87.8%). The results in the present study were different from Insin P et al (2013) (71%) and Abdulrahman GO et al (2014) (79%). This may be due to large study size in both these studies (547 patients in Insin P et al (2013) and 247 in Abdulrahman GO et al (2014) study) compared to our study and different geographical distribution (Thailand in Insin P et al [23] (2013) and South Wales in Abdulrahman GO et al (2014) study).

Conclusion

Key message- RMI-2 is a simple, easy, cost effective method to differentiate between benign and malignant adnexal mass with high sensitivity with consequent decision for appropriate surgical approach. However, smaller study size, larger number of premenopausal

women, most of benign ovarian tumors were some of the limitations in present study.

Ethical Clearance- Taken from institute ethics committee, GMC Patiala

Source of Funding- Self

Conflict of Interest- Nil

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Competency based Training & Evaluation of Final Year MBBS Students on Neonatal Resuscitation

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Abstract

Introduction: Currently the final year students are taught neonatal resuscitation in the form of conventional lectures which fails to develop & assess their skill to actually provide effective basic newborn resuscitation care at the time of birth.

Aim & Objectives: Competency based training of MBBS final year students to provide basic resuscitation to a newborn at the time of birth & their evaluation.

Methodology: Prospective Interventional study was done at Muzaffarnagar Medical College, Muzaffarnagar on 100 final year students (four groups of 25 students each). An interactive lecture of one hour duration of all 100 students & a two hour tutorial of each batch of 25 students with hands-on demonstration on manikin was held. A pre-test, a day before lecture & tutorial and post-tests, first a day and second 3 months after training in the form of validated MCQ written test and OSCE were taken for assessment. Feedback of students and faculties was taken on a five point Likert scale.

Result & Conclusion: 80 students scored > 75% marks in MCQ post-test1 (Mean score \pm SD 76.51 \pm 10.38, p value <0.001) and 94 students scored > 75% marks in OSCE post-test1 (Mean score \pm SD 91.30 \pm 13.40, p value <0.001) as compared to only 48 and 16 students in MCQ (Mean score \pm SD 51.51 \pm 11.33) & OSCE (Mean score \pm SD 65.28 \pm 9.18) pre-test respectively, thus proving that competency based newborn resuscitation training was very effective to develop necessary knowledge and skill of final year MBBS students. Retention of knowledge and skill was also evident from the scores of second post-test taken after 3 months. 74 students scored > 75% marks in MCQ post-test2 (Mean score \pm SD 67.06 \pm 8.61, p value <0.001) and 90 students scored > 75% marks in OSCE post-test2 (Mean score \pm SD 83.45 \pm 8.94, p value <0.001). Students' appreciated interactive environment, resources shared and knowledge, communication & facilitation skill of trainers while faculties' feedback was well perceived regarding training material and students' attention & body language.

Keywords: Neonatal Resuscitation, Birth Asphyxia, Competency based training

Introduction

UNICEF published its first-ever report on the newborn mortality rate, on Tuesday, 20th February 2018.

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According to the report, every year 26 lakh babies die worldwide within 28 days of birth, which is an average of 7,000 deaths every day. Of these, 6.4 lakh neonatal deaths occur in India. At neonatal mortality rate of 25.4 deaths per 1,000 live births (12th worst among the 52 lower-middle-income countries), India is quite far from meeting the commitment to lowering the neonatal mortality rates to 12/1000 live births¹.

Birth asphyxia accounts for approximately 19 % of total newborn deaths in India. Around 10% of newborns require basic resuscitation, including stimulation at birth and about 1% need assisted ventilation with bag and mask, to initiate breathing^{2,3}. These deaths can be prevented by improving antenatal care, especially by providing skilled resuscitation at delivery. Resuscitation efforts at birth are designed to help the newborn to make the respiratory and circulatory transition that must be accomplished immediately after birth, which result in lung expansion and elevation of PaO₂.

Hence, all skilled birth attendants (who are defined as doctors, midwives and other health professional trainees to manage normal pregnancies and childbirth, to identify and manage complications in women and newborn, and make needed referrals) should have the capacity to resuscitate newborn babies, whether deliveries take place in health facilities or at home. For resuscitation to be successful, it requires good understanding by the health-care personnel working in labour, maternity and newborn unit to have adequate skills for prompt neonatal resuscitation. Adequate knowledge and awareness about neonatal resuscitation plays a major role in early diagnosis, appropriate management and, accordingly, reduction of adverse consequences.

At present, final year students are taught neonatal resuscitation in the form of conventional lectures which impart them the knowledge regarding birth asphyxia and neonatal resuscitation but it fails to develop & evaluate their skill to actually provide effective basic newborn resuscitation care at the time of birth.

An objective structured clinical examination (OSCE) is a modern type of examination often used in health sciences. It is designed to test the clinical knowledge, skill performance and competence in skills such as communication, clinical examination, medical procedures / prescription^{4,12}.

An objective structured clinical examination (OSCE) is very useful tool to evaluate the Neonatal Resuscitation skills and knowledge of health care professionals (faculties, residents, interns and nursing staff of labour room & OT) dealing with child birth. It is a hands-on, real-world approach to learning that keeps examinees engaged, allows them to understand the key factors that derive the medical decision making

process, and challenges the health care professionals to be innovative and reveals their errors in case handling and provides an open space for improved decision-making, based on evidence based practice for real-world responsibilities^{4,12}.

Aims and Objective

1. To carry out training of final year students for basic neonatal resuscitation and routine newborn care.
2. To assess neonatal resuscitation knowledge and skills of final year students.
3. To take feedback of students and faculty regarding the competency based training & evaluation method.

Material and Methods

Place: Muzaffarnagar Medical College, Muzaffarnagar

Study Design: Prospective Interventional study

Target Subjects: 100 final year students, divided into four groups of 25 students each

Methodology: This Prospective Interventional study was started in November 2018 after taking Institutional Ethics Committee approval & written informed consent from the students. A meeting of curriculum development committee of the institute, along with all the faculties of the department of Paediatrics, was held in the month of November 2018 to develop a competency based teaching module on Neonatal Resuscitation for Final MBBS Students with the help of NNF teaching aids, AIIMS Neonatology protocols and Navjaat Shishu Suraksha Karyakram, Ministry of H & FW, Govt. of India. This module had interactive lecture and tutorial including group discussion, role play and hand on demonstration on manikins to help them to acquire necessary knowledge and skill regarding effective basic newborn resuscitation care. A MCQ based written test and OSCE stations were also developed for evaluation of their knowledge and skill regarding effective basic newborn resuscitation care.

An interactive lecture of one hour duration of all 100 students was taken by faculty and a two hour tutorial of each batch of 25 students with hands-on demonstration on manikin was taken by the senior resident doctors in

the first week of December 2018. The senior resident doctors were given module prepared by faculties of department for uniform teaching of final year students.

A pre-test, a day before lecture & tutorial and two post-tests, first a day after training and second 3 months after training in the form of validated MCQ written test and OSCE were taken for assessment. A 2 hour tutorial

of each batch with hands-on demonstration on manikin was held by the senior residents on same day. Post-test assessments with pre-validated 20 MCQ written test and OSCE were done on next day and after 3 months. Feedback of students and faculties was taken on a five point Likert scale regarding the newly introduced training & evaluation methods.

Observation and Results

Table 1: Pre and Post MCQ test performance to students

	PreTest	Posttest 1	Posttest 2
No. of students Passed (Score >75%)	48	80	74
Mean Score ± SD	51.51 ± 11.3	76.50 ± 10.38	67.06 ± 8.61
P value- pretest vs. posttest	< 0.001	< 0.001	< 0.001

Table 1: Describes MCQ pre and post test marks, in pre test 48 out of 100 students scored >75% marks, while in post test 1, 80 out of 100 students scored >75% marks scored and in post test 2 74 out of 100 score >75% marks

Table 2: Pre and post OSCE test performance to students

	Pre Test	Post Test 1	Post Test 2
No. of students Passed (Score >75%)	16	94	90
Mean Score ± SD	65.28 ± 9.18	91.30 ± 13.40	83.45 ± 8.94
P value- Pretest vs Posttest	< 0.001	< 0.001	< 0.001

Table 2: Describes pre and post test OSCE marks, in pre test 16 out of 100 scored >75% marks, while in post test 1, 94 out of 100 students scored >75% marks scored and in post test 2, 90 out of 100 score >75% marks

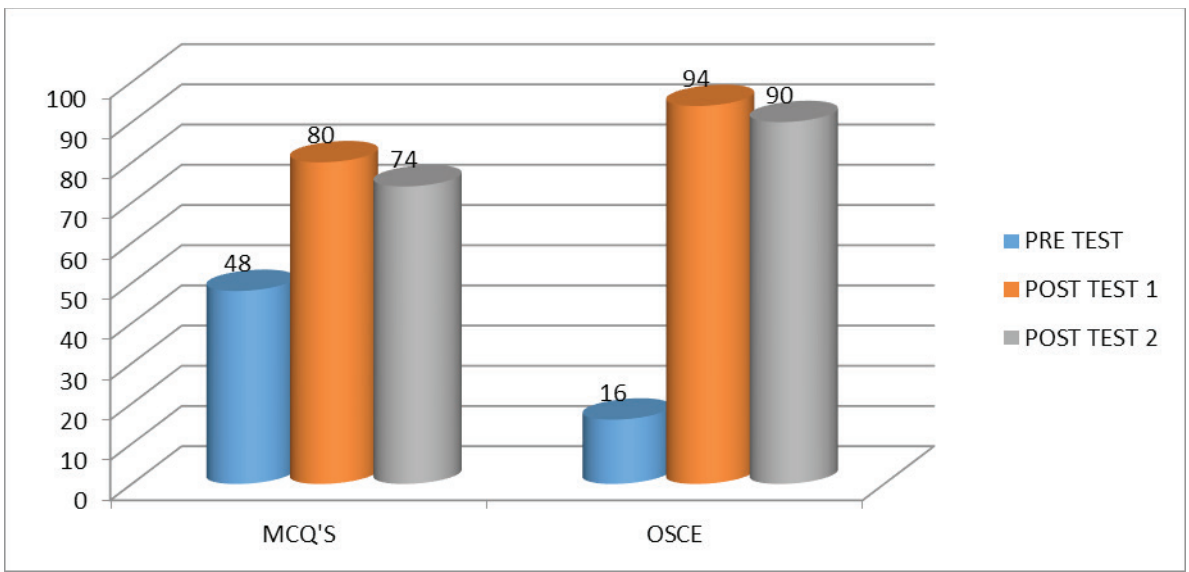


Figure 1: Vertical cylindrical diagram of percentage of students passed

Shows number of students scored >75 % marks in pre test, post test 1 and post test 2 on basis of MCQ's and OSCE

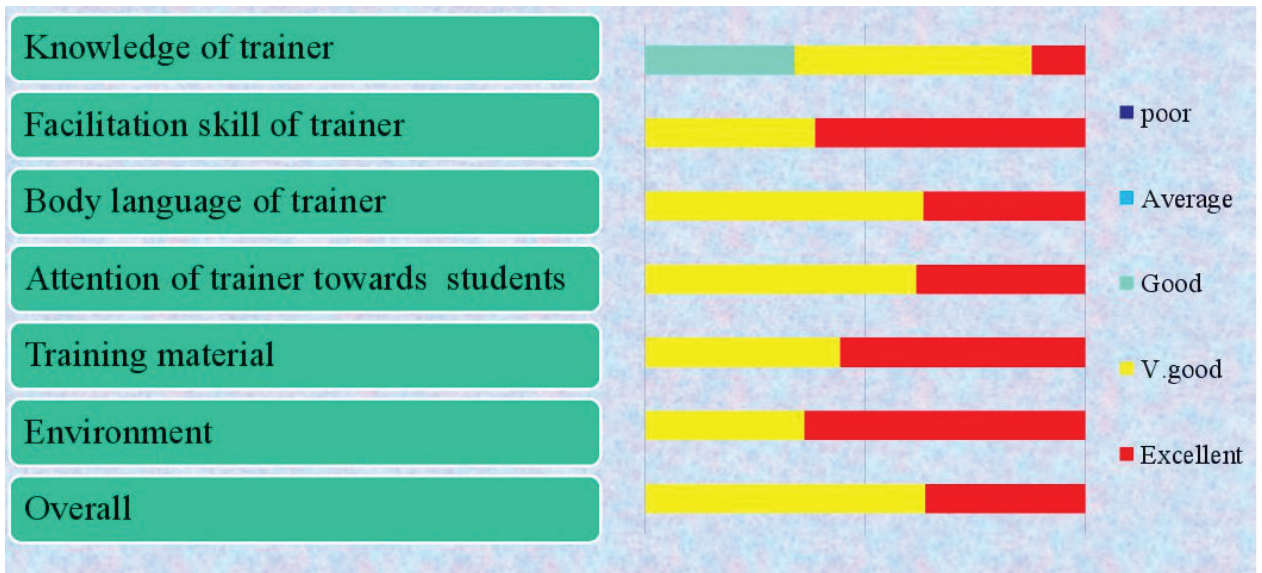


Figure 2: Students feedback on 5 Point Likert Scale

Students gave feedback in questionnaire form, rating given as poor, average, good, v,good, excellent.

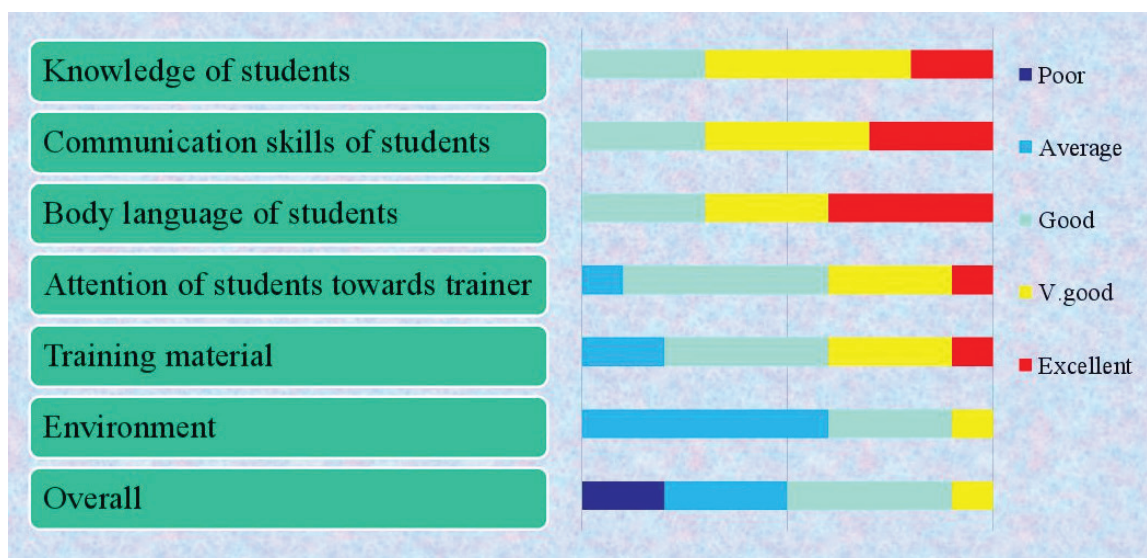


Figure 3: Faculty feedback on 5 Point Likert Scale

Faculty gave feedback in questionnaire form, rating given as poor, average, good, v.good, excellent

Discussion

Genesis: In the mid 1970s, neonatal intensive care units (NICUs) had become common in and as a result, the National Institutes of Health (NIH) funded five projects to provide fundamental neonatal care education to hospitals with level 1 perinatal services. Dr. Ron Bloom and, Cathy developed the Neonatal Education Program (NEP), a 6-module series focused on neonatal resuscitation. These modules formed the basis of the future Neonatal Resuscitation Program®. Members chair of the American Academy of Pediatrics (AAP) Section on Perinatal Pediatrics, advocated for the development of a neonatal resuscitation core curriculum. They met with representatives from the AHA to explore a course structure. Both organizations expressed a joint commitment to develop a training program aimed at teaching the principles of neonatal resuscitation with the goal of having a trained provider at every delivery. In 1987, the AAP Section launched the Neonatal Resuscitation Program (NRP) program in New Orleans in November 1987. Within a year, NRP had reached 48 states and Canada with 184 National Faculty and 876 trained Hospital-based Instructors. The program continued to expand, both in the US and internationally. NRP continues to meet the learning needs of instructors and providers through award winning state of the art

interactive education in 130 countries.^{13,14}

First International Course on NRP in India was conducted in 1989. National Neonatology Forum (NNF) created a national faculty of 150 pediatricians and nurses for NRP, who trained 12,000 healthcare professionals in various parts of India over the following 2 years in advanced course of NRP. But there was no follow up or monitoring and no system of certification or training was in place which is an essential component of good NRP program. Since then, the NRP has been taught sporadically in India. However for a country of the size of India with 27 million deliveries per year the programs need to be up scaled substantially. To have a skilled birth attendants trained for every delivery, more than 0.25 million health professionals needed to be trained in NRP including physicians, pediatricians, obstetricians, anesthetics, nurses, midwives and other categories. It is also essential that such skilled professionals are available in a short period of time to meet the requirement of MDG4 goal and NRP. This would require massive organizational support. Isolated training efforts have had little impact on influencing neonatal training efforts, largely due to size of country.¹⁵

However there was no such training program as a part of MBBS curriculum and final year MBBS students were taught neonatal resuscitation only as didactic lectures with little or no Hands on training on manikins. Our aim was to train final year IMG to provide basic

neonatal care at the time of delivery.

The development of OSCE for the evaluation of neonatal resuscitation skills and the assessment of students' knowledge, experience and competence in performing neonatal resuscitation was described by Javad Malekzadeh, Fatemeh Erfanian & Talaat Khadivzadeh in 2015. In their study, regarding knowledge about neonatal resuscitation, students obtained almost half of the total score in MCQ pretest while in terms of students' neonatal resuscitation skills, the findings were dissatisfactory as 84.6% of students had poor skills in neonatal resuscitation, and students obtained less than 50% of the total score in OSCE pretest, which indicated lack of knowledge in cardiopulmonary resuscitation.⁴

Similarly in our study, we observed that students performed well in MCQ's based pretest as compared to OSCE based pretest due to their existing theoretical knowledge only with no practical skill. Almost half of the students (48 out of 100) passed in MCQ pretest (Mean score \pm SD 51.51 \pm 11.33) while only 16 students were successful in OSCE pretest (Mean score \pm SD 65.28 \pm 9.18). But in post test OSCE score was better than MCQ' based test as out of total 100 students, 94 students scored > 75% marks in OSCE post-test1 (Mean score \pm SD 91.30 \pm 13.40, p value <0.001) as compared to 80 students scored > 75% marks in MCQ post-test1 (Mean score \pm SD 76.51 \pm 10.38, p value <0.001).

Retention of knowledge and skill was also evident from the scores of second post-test taken after 3 months. 74 students scored > 75% marks in MCQ post-test2 (Mean score \pm SD 67.06 \pm 8.61, p value <0.001) and 90 students scored > 75% marks in OSCE posttest2 (Mean score \pm SD 83.45 \pm 8.94, p value <0.001).

This shows that real-world approach to learning have better impact in decision making while handling the patient.

Result

In our study, students performed well in MCQ's based pretest as compared to OSCE based pretest due to theoretical knowledge. But in post test OSCE score is better than MCQ' based test, this shows that real-world approach to learning have better impact in decision making while handling the patient. During feedback on

five point Likert scale, students appreciated interactive environment, resources shared and knowledge, communication & facilitation skill of trainers while faculties' feedback was well perceived regarding training material and students' attention & body language.

Conclusion

Competency based training of Indian medical graduate (IMG) will make them competent to provide basic resuscitation to a newborn at the time of birth leading to reduction in Neonatal mortality to Sustained Development Goal (12/1000 live birth).

Limitations: Small sample size of only 100 students and only one time intervention limits this study. Repeated teaching is also required.

Conflict of Interest: None

Source of Funding: Self

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Evaluating the Effectiveness of Informational Booklet on Knowledge of Osteoporosis among Working Women of, Kolhapur Information Booklet and Osteoporosis

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Abstract

Background: Osteoporosis is a crippling disease. Most cases are undetected till the occurrence of a fracture. Hence, lack of knowledge among women has contributed towards high prevalence of osteoporosis. Therefore, aim of study was to evaluate the effectiveness of informational booklet on osteoporosis among working women of Kolhapur.

Methods: An Interventional study conducted among consenting women staffs of 20-50 years age, of tertiary care hospital, Kolhapur between July 2017–2019. Data collection was done pre and post intervention with a validated and pilot tested questionnaire. Content of the questionnaire included questions pertaining to demography, osteoporosis and its prevention. Data was analysed using R software v 3.6.0. Chi-square test and Wilcoxon's sign rank test used to find the relationship between the variables, ($P < 0.05$).

Results: Of the total participants ($n=60$), most of the women were in the age group of 31-40 ($n=36$) and were Class 4 worker ($n=32$). Women had received education till graduation($n=24$), followed secondary education ($n=18$). Good knowledge scores were not observed with pre-test scores. A significant difference observed between both test scores with the average post test score increasing by 4.9, ($P<0.0001$). After intervention, good scores increased from 0 to 24. Significant association observed between post-test scores and education, occupation, informational booklet, respectively. ($P < 0.05$)

Conclusion: Information booklet can be an effective media for imparting knowledge of osteoporosis.

Keywords: Bone, female, occupation, pamphlets, questionnaire

Introduction

Osteoporosis is a health issue globally, along with heart disease, stroke, diabetes and cancer, taking up a large amount of financial resources for treatment.^{1,2}

Considered a crippling condition, it most often leads to premature mortality, and significant morbidity

manifesting in the form of fractures, bone deformity, and pain.³Worldwide, osteoporosis is the cause of more than 8.9 million fractures annually, with an osteoporotic fracture every 3 seconds.⁴ Asia region is expecting the most dramatic increase in fractures during coming decades; 1 out of 3 females in India suffers from osteoporosis, making it one of largest affected countries.

Maharashtra comes at 10th rank out of 17 major states for nutrition index, so the situation may be regarded as a crisis situation.⁵ Hence, osteoporosis can begin as early as age twenty-five, and poor knowledge of bone health have contributed towards high prevalence. Most patients go undiagnosed until a fracture occurs. Therefore, it is imperative to promote educational interventions

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designed for prevention in women.⁶

Hence, objective was to study the socio-demographic variables, to find out an association between the pre-test and post-test osteoporosis knowledge score of working women with socio-demographic variables, respectively, and to evaluate the effectiveness of informational booklet on knowledge regarding osteoporosis, and its prevention among working women.

Methods

Preparation, validation and reliability testing of structured knowledge questionnaire and Information booklet

Structured knowledge questionnaire on osteoporosis, hereafter referred to as the tool, was designed after thorough literature review and expert discussions. Gilberts classification was used to analyse items in the tool. Information booklet was developed post expert consultation and review of literature. Tool and the information booklet were validated by 16 experts from medical surgical nursing, MD medicine, MA Marathi and English. Reliability of the tool was assessed by ‘Test retest method’ using Karl Pearson’s Coefficient of correlation.

Study design, data collection, and pilot study

A quasi experimental study with pre- test post-test design was conducted among hospital staffs of tertiary care hospital, Kolhapur between July 2017–2019. Data collection commenced post institutional ethical Committee clearance and local permissions. Sample selection was done based on non-probability purposive sampling. Working women of 20-50 years of age, willing to give informed consent, were included in the study. Women with pre-existing conditions of diabetes mellitus, hyperthyroidism, cancer and multiple sclerosis were excluded. Information booklet was used as the intervention. Pre- experimental knowledge and post interventional knowledge was compared and scored using the tool. Pre experimental knowledge was evaluated by providing the study participants with the tool and grading the responses as Good knowledge (21-30), average knowledge (11-20), and poor knowledge (0-10) based on the number of correct answers. Post intervention knowledge was graded similarly. Pre-

test was conducted on the day of administration of the booklet. Post test was conducted 8 days later.

A pilot study was conducted at Aster-Aadhar Hospital and Research Centre, Kolhapur on ten participants. Informational Booklet was administered to the subject after pre-test. Post test was conducted 7 days later using the same tool.

Statistical Analysis

Data obtained was tabulated and analysed using R software (version 3.5.0). Socio-demographic variables were represented using frequency distribution. Chi-square test and Wilcoxon’s sign rank test used to find association between the variables, (P < 0.05).

Results

Difficulty index on the item analysis of the tool revealed 3, 22 and 5 as difficult, good and easy questions respectively. Discriminative index indicated 12, 12, 0 and 6 questions to be excellent, good, marginal and poor respectively. Of the 30 items analysed, some were modified, and the final tool consisted of 30 questions. The tool consisted of two parts: Section A: 7 items to obtain sociodemographic data and Section B was the Structured knowledge questionnaire on knowledge regarding osteoporosis and its prevention (Table 1)

Table 1: Osteoporosis Questionnaire

Sr. No	Content	Total number of questions
1.	Meaning of osteoporosis, bone made up by, causes	11
2.	Sign and symptoms, complication, basic investigations	06
3.	Nutrition, prevention	11
4.	Consequences	02
	Total number of questions	30

Information booklet consisted of the following information: Introduction and the meaning of osteoporosis, the effect of osteoporosis on bone, causes of osteoporosis, prevention of osteoporosis, good for your bone Foods, detection of osteoporosis, consequences of osteoporosis.

Sixteen experts validated the tool, they were from medical surgical nursing 9 (n=12), Md Medicine (n=2), M. A in Marathi (n=1), M. A in English (n= 1). Reliability of the tool was computed as $r = 0.74$

Socio- demographic distribution of the participants and knowledge score

Of the total participants (n=60), majority were in the age group of 31-40 (n=36), received education till graduation, (n=24). Most of them were Class 4 Worker (n=32) and had no history of fracture (n=55). Source of information among the participants were newspaper (n=19),and followed by television (n=17). Table 2

Table 2: Frequency distribution table of socio-demographic variables

Socio-demographic Variables	No. of participants (%)
Age in years	
21 - 30	14 (23)
31 - 40	36 (60)
41 – 50	10 (17)
Education	
Primary	9 (15)
Secondary	18 (30)
Higher Secondary	9 (15)
Graduate	24 (40)
Occupation	
Administrative work	9 (15)
Clerical Work	19 (32)
Class 4 Worker	32 (53)
Age of Menarche	
11 – 14	42 (70)
15 – 18	18 (30)
Informational Sources	
Newspaper	19 (32)
Books	12 (20)
Television	17 (28)
Internet	12 (20)
History of Fracture	
No	55 (92)
Yes	5 (8)

In the pre-test scores, good knowledge score was not observed. Participants in age group of 31- 40 had the highest average score. Participants who were graduates seen to have the highest average knowledge score. Class 4 workers had a higher average knowledge score than rest of the participants. Figure 1

No association was seen between socio-demographic variables and pre-test score ($P > 0.05$).

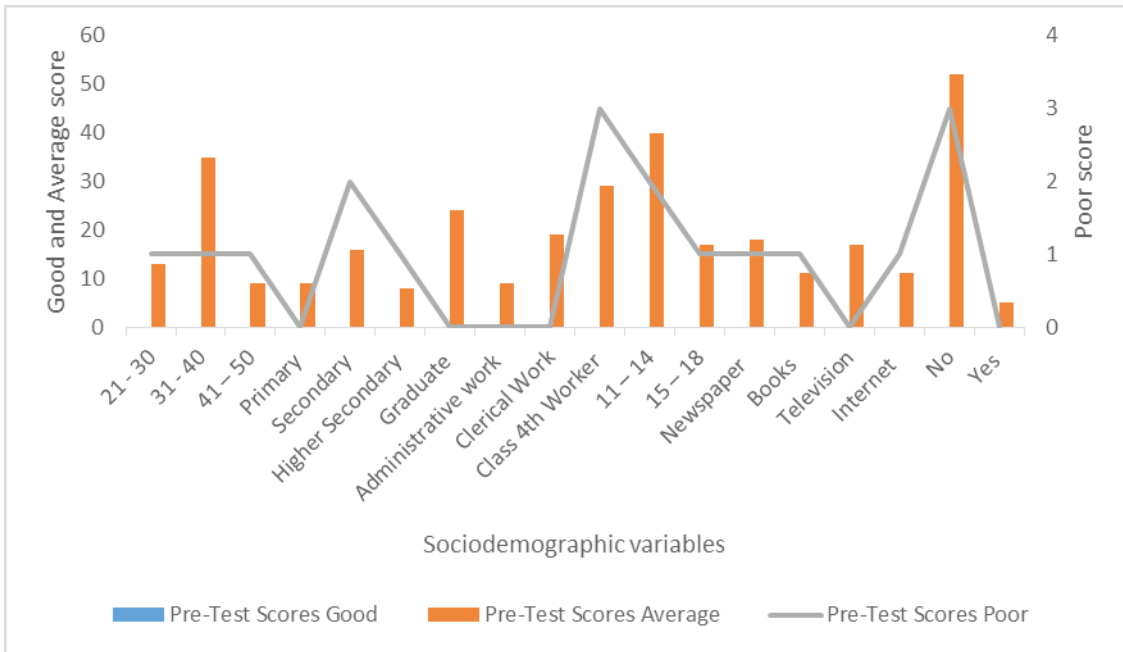


Figure 1: Distribution of socio-demographic variables and pre-test score

Wilcoxon’s sign rank demonstrated a significant difference between pre-test and post-test scores with the average post test score increasing by 4.9 at 5% level of significance ($P < 0.0001$). Good scores were seen to increase from 0 to 24, average knowledge scores reduced from 57 to 36, and poor scores reduced from 3 to 0. Post test scores were found to be significantly associated with education, occupation, informational booklet, respectively. ($P < 0.05$)

In pre-test majority of the subjects had average knowledge (95%), while in post-test it varied between good to average (40% to 60%, respectively). Figure 2

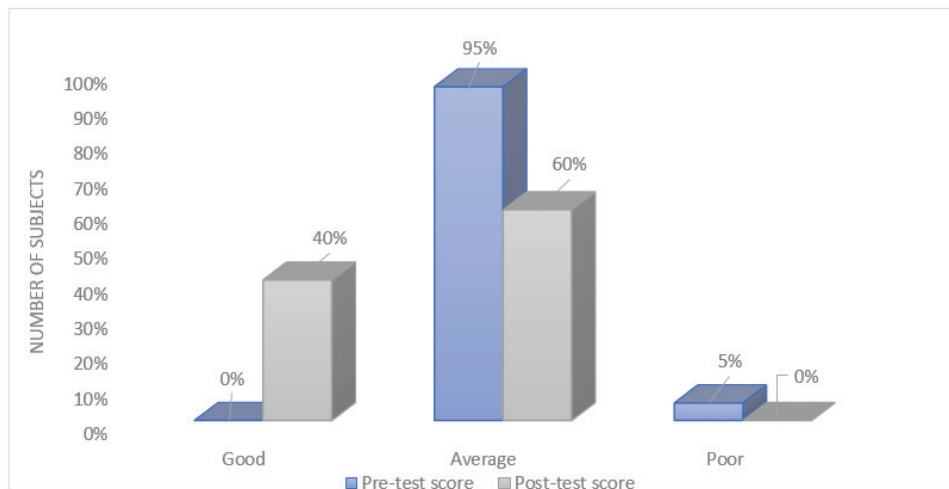


Figure 2: Distribution of Pre-test score & Post-test score

Discussion

Osteoporosis has become a major global health problem currently affecting more than 200 million people world-wide, and resulting in an osteoporotic fracture every 3 seconds.^{7,8} 1 out of 3 females in India suffers from osteoporosis. It is considered to be one of the costly health problems in India posing an economic burden on our country. Despite many emerging therapies for osteoporosis, it remains essentially incurable and prevention is still preferable for controlling the disease. It is seen that patients report to the doctor in later stages of disease.⁹ Hence, this study aimed to assess effectiveness of informational booklet on knowledge regarding osteoporosis among working women of, Kolhapur.

All women were in the reproductive age group of 31-40 years. Similar findings were seen in previous studies.¹⁰ In this age group women are usually susceptible to risk factors of osteoporosis. Hence, awareness and early screening programs for the diagnosis of osteoporosis should be started at a young age.¹¹

Participants were educated as seen in other studies.^{12,13} Education might impact the choice of better sources of calcium.¹³ It would also help in grasping the underlying importance of prevention. Hence, a significant association was found between post test scores and education.

Occupation and physical activity both affect bone health. Women with sedentary occupation, walking activities and heavy weight lifters are at an increased risk of osteoporosis.^{14,15} As these group of workers would be made aware of these issues with the information booklet, this would explain the significant relationship observed between post test scores and occupation.

Menarche was seen at an appropriate age in the participants.¹⁰ Late menarche age is considered a risk factor for osteoporosis, as it impairs peak bone mass.¹⁶

Commonest source of knowledge among women was television and newspaper. This is in concurrence with other studies.^{10,17} It implies accessibility and affordability of mass media. In turn media can be used as a means of health education.¹⁸

Participants had no previous history of fracture as seen in previous study.¹⁹ History of fracture has been

considered as strong predictor of Osteoporosis.²⁰

There was no significant association observed between socio-demographic variables and pre-test score. However, participants in 31-40 years age group, who were graduates and class 4 workers had average knowledge about osteoporosis.

Ideal treatment for osteoporosis is prevention.²¹ The information booklet served as an effective media for increasing knowledge on Osteoporosis. This is obvious with the visible increase in average post test score. Significant association was also found between post test scores and informational booklet. Similar findings were seen in other studies.^{22,23}

The study limitations could be its small sample size. Future researches should focus on rural population.

Conclusion

There was significant increase in post-test score. Thus, information booklet was effective in enabling women to learn more about osteoporosis. Imparting osteoporosis knowledge to younger age group can be an important strategy in curbing osteoporosis.

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Health Care Utilisation among Persons with a type 2 Diabetes Mellitus a Mixed-Method Study

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Abstract

Background: Type 2 diabetes mellitus (T2DM) is a chronic condition requires Self-management to achieve optimal glycaemic control. The utilisation of healthcare services is a critical component in diabetes self-management

Objectives: To assess the healthcare utilisation among the people with T2DM and to explore the healthcare utilisation practice among the people with T2DM.

Method: A mixed-method using sequential explanatory design was adopted to conduct the study. The study was conducted in two phases. In the first phase, a cross-sectional survey design was used to collect the quantitative data and further explored it qualitatively in phase II by thematic analysis. For Phase I and II, a simple random and purposive sampling technique were adopted, 35 participants (Phase II) who are recruited from the sample of 467 (Phase I).

Results: Among all participants, only 16% with T2DM had health insurance coverage. Furthermore, complementary healthcare service consultations among these T2DM participants were low 28.3 % the participants had an inadequate score of healthcare service utilisation. The qualitative data analysis in phase II generated three themes which are “Information driven healthcare utilisation”, “Health Care Utilisation in the dependent” and “Constraints vs Solutions”.

Conclusion: diabetes self-management Education (DSME), employee staff welfare, patient-centred hospital/ clinic management, positive attitudes of healthcare professionals and employees supportive policies for the utilisation of healthcare services, would facilitate the optimal use of healthcare services by individuals with T2DM.

Keywords: Type 2 Diabetes Mellitus, Health Care Utilisation, Self-Management

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Introduction

The International Diabetes Federation (IDF) estimated that in 2017 about 425 million adults (20-79 years) were living with T2DM; this could grow to 629 million by 2045.¹ There is a substantial rise in the number of diabetics in India from 1990 to 2016.²

T2DM is a complex, chronic condition with many acute and chronic complications which are mainly determined by poor glycaemic control.³ People with T2DM require requires lifetime management and consistent compliance.⁴

In addition to medication the glycaemic control in people with T2DM depends upon lifestyle modification (dietary control, physical activity, stress management), compliance to medications, self-monitoring of blood pressure and, most notably, optimal utilisation of health services such as periodic check-ups, laboratory tests and counselling.³⁻⁵

The income, health literacy, depression, competing demands, family dynamics and support limits the health care utilisation among the people with T2DM.^{3,6} Very little known on the extent to which access of healthcare services in diabetics. It is essential to have an insight into the overall picture on use of healthcare services along with facilitating factors and challenges. So, we have designed this study with the objective also to explore the healthcare utilisation practice among the people with T2DM.

Materials and Methods

A mixed-method approach using sequential explanatory design was adopted. This approach comprised of collecting, analysing, and integrating both quantitative and qualitative data. The study was conducted in two phases. After collecting quantitative data during phase I using a cross-sectional survey design, further explored the healthcare utilisation practice in diabetics qualitatively by a thematic analysis in Phase II.

The research was conducted among People with T2DM from Udupi Taluk of Karnataka state. Simple random technique was adopted in phase I. The sample size of the study was 467. This study included people with T2DM (both genders), between the ages of 30 and 65 years, irrespective of their medication status for T2DM.

In phase II, purposive sampling was adopted. In the cross sectional survey among 467 participants, who scored the lowest and the highest in the Diabetes Self-Management Questionnaire (DSMQ) were selected. Data saturation was achieved after obtaining the data

from 35 participants.

For the cross-sectional survey, the structured interview schedule was used comprising of a demographic proforma, healthcare utilisation checklists and DSMQ.^{7,8} In phase-II, in-depth interview adopted using the validated questions on healthcare utilisation. The main question to participants was “describe how you utilise healthcare services”.

The data set was prepared and analysed using SPSS version 16.0 in phase I. In phase II, audio recording from the interview was transcribed verbatim. The transcripts were checked for accuracy and further processed for analysis. Open Code software (OPC; version 3.6.2.0) was used to analyse the interviews. Six-step process of thematic analysis was used.⁹

Results

Quantitative Findings:

The descriptive analysis of the diabetes-related information and healthcare utilisation is presented in Table 1. The descriptive statistics are represented using mean and standard deviation (SD).

According to our study, only 29.1% of the participants had adequate diabetes self-management practice score. Only 28.3 per cent of participants had an adequate score, and the remaining 71.7 per cent had an inadequate score for the use of health services.

Qualitative Finding:

Exploration and description of healthcare utilisation in diabetes self-management practice using thematic analysis:

In phase II, the qualitative study group consisted of 20 males and 15 females, the mean age of participants was 50.95 (SD 8) and the mean duration of diabetes was 7.4 (SD 4.65).

Information-driven healthcare utilisation: lack of information on periodic check-up as a part and current practice:

The majority of participants were ignorant about the need for the regular check-up and test schedule recommended for the T2DM. However, 75% of

the participants adhered to a quarterly physician consultation or family doctor. During each visit, most of them underwent a blood glucose test along with Blood pressure (BP) measurement. The majority of participants relied heavily on pharmacological management.

“Doctor writes some other tests and gives, in a lab I do and show the doctor, after three months they write a different test, today they have given, I did not do.” Female Participant (FP) 4

“Yes, since I have diabetes and it is a lifetime disease, I made a point to consult a doctor regularly, medication is all for this” Male Participant (MP) 11

Healthcare Utilisation is dependent: Periodic check-up and consultation is the doctor’s decision

Predominantly, doctors decided on the periodic check-ups and examinations. The knowledge about diet, exercise, and other complementary healthcare consultations limited. However, most of the participants volunteered for the eye examination.

“Only cholesterol test was performed no other tests. Whatever the doctor says I am performing it.” MP 8

“My eyes were blurred for a few months, I heard that diabetes leads to the eye complications so last month consulted the eye specialist and done with the required test” MP 14

Constraints vs Solutions: Challenges and solutions in healthcare utilisation other than lack of knowledge:

The missing of periodic check-ups were due to multiple difficulties. Some are related to a healthcare setting such as the behaviour of healthcare providers, long wait in the hospital, expensive consultation fees, expensive tests and poor quality care in public and private sectors. Some difficulties are related to patient behaviours such as the inclination to alternative medicine, complementary therapy, festival and function (event) seasons, feasts, inadequate daily wages, non-availability of leave and dependency on others for visiting a clinic.

“I have to bear one day for that... here I lose my earnings there I have to spend his consultancy charges etc two side loss, needs one hour to reach Udupi.” MP 11

“I have to go in the morning, 7’O clock bus if we go, till 12.30 we have to be there waiting for the doctor and long queue... It is difficult for me at home it has been six months since I tested now. ...” FP 15

Health insurance covering the OPD or discount health card, advance appointment and patient registration, effective individual time schedules, staff-friendly wellness programs and quality healthcare facilities in a number of the proven public health favourably contributed to compliance with periodic health check-up and healthcare utilisation.

“I have plenty of work at home; when it comes to the consultation I will not miss the appointment, I finish the house chore work early in the morning, my son drops me, while coming I come in a bus” FP 11

The behaviour of healthcare providers is the one factor that determines the participants’ periodic check-up. Most of the participants who had better attendance with the routine check-up were positively attributable to doctor availability, time spent by a healthcare provider, good doctor, , doctor’s elucidation, compassionate, appropriate, beneficial interaction. Contrary to this, non-availability of the doctor, impatient doctor, sporadic doctor communications, annoyance by a junior doctor, language barriers, and lack of eager listening was the list of factors making periodic check-ups detrimental.

Structured health clinic registration, affordable care, health cards and quality service in the public health system are the factors facilitating the periodic check-up; expensive consultation charges, costly drugs, long queues were hindering the adherence to periodic check-up.

Table 1: Details of diabetes and healthcare utilisation of the phase I participants (N = 467)

Details	Mean (\pm SD)	Frequency (Percent)
Type of Health Care Utilisation		
Private		350 (74.7%)
Government		117 (25.3%)
Health Insurance Holders		
Yes		75 (16%)
No		392 (84%)
OPD Benefit Card Holders		
Yes		66 (14.13%)
No		401 (85.87%)
Consultation of Ophthalmologist		
Consultation Obtained		268 (57.4%)
Consultation not obtained		199 (42.6%)
Consultation of Dietitian		
Consultation Obtained		65 (13.9%)
Consultation not obtained		402 (86.1)
Consultation of Physiotherapist/Yoga therapist		
Consultation Obtained		10 (2.1%)
Consultation not obtained		457 (97.9%)
Consultation of Diabetes Educator		
Consultation Obtained		40 (8.6%)
Consultation not Obtained		427 (91.4 %)

Discussion

Our results revealed that per capita direct monthly expenditure on T2DM care in was Rs 1333.5/-. Similarly, a study from in Bengaluru had reported Rs 1,288.36/ was the per capita mean.¹⁰ However, the study published by the *Ramachandran et al.* reveals a lower direct expenditure of Rs 833/- per month in the Urban and Rs 522/ month in the rural areas.¹¹ The indirect cost in our study includes the costs related to absenteeism, income loss of caregiver and patient, and permanent disability. The indirect cost was reported as Rs 470.22/ per month. In contrast, the indirect cost reported were Rs 297.66/- and Rs 174/- by *Rayappa et.al* and *Ramachandran et al.*^{10,11}

According to our study, 25.3% of the study population availed healthcare services from the government sector. The public health system of India

accounts for 18% of total outpatient services and 44% of total inpatient care.¹²

In the present study, 16% of the diabetics had health insurance coverage, while the remaining 84% had no coverage. 14.13% of participants had OPD benefit cards of specific hospitals, and 25% used public health services to manage their T2DM. Similar to our observations, *Swagatika Priyadarshini Swain et al.* published a report, which observed that 76% health expenditures on T2DM management is beyond their ability to spend and 56% of T2DM patient's drug expenditure was beyond their financial ability.¹³

In the present study, 57.4% of T2DM patients consulted the ophthalmologist, whereas only 13.9%, and 2.1% consulted the dietician and exercise/yoga trainer. There were 8.6% of diabetics consulted the diabetes educator. None of the previous studies reported details

on diabetes management consultation on above streams. ICMR suggested T2DM patient should consult respective experts such as ophthalmologist, dietician exercise consultants at least once annually.¹⁴ Predominantly, instead of patient, their doctors decided the need and importance of periodic check-ups and examinations. However, the only consultation for which participants volunteered was the eye examination.

There were 71.7 % of participants had inadequate score in healthcare. Further, in the qualitative results reported majority of participants were ignorant of the regular check-up and test schedule recommended for diabetics. However, 75% of the participants adhered to a quarterly physician's or family doctor's consultation. The ICMR recommended minimum one clinical examination for three months and monthly FBG and PPBS testing.¹⁴ Similarly, a study carried out in the Netherlands found that people with T2DM were underutilising the healthcare facilities.¹⁵ In contrast, a research study reported from Bangladesh and Australia showed that participants visited a doctor and associated healthcare practitioners 2-12 times and four times in a year, respectively.^{6,16}

Long wait in the hospital, the behaviour of healthcare providers, alternative medicines, complementary therapy, festival and function season, feasts, expensive consultation fees, expensive tests, poor quality care in public and private sectors, loss of daily salaries, non-availability of leaves, dependence on others for visiting clinic were the difficulties that participants shared on missing the periodic check-ups and examination. Also, negative attitudes of the health care providers were causing periodic check-up detrimental. The similar findings in the study conducted in Oman reported that patients found certain shortcomings such as: unfriendly welcome; disrupted empathetic of consultation; inadequate focus; and lack of motivation for the patients to ask questions.¹⁷

The present study reported structured health management includes (advance clinic registration, crowd management etc) affordable care, effective individual time scheduling, staff-friendly wellness programs, health cards and quality service in the public health system are the factors facilitating the periodic check-up. Similarly, Substantial in-person contact programs that address mild

to severe patients may be cost-neutral and enhance many facets of healthcare;¹⁸ imparting education, eliminating the financial obstacles and patient centred model of communication integrates persons preferences, literacy, numeracy and cultural differences could be used in care.¹⁹⁻²¹

Conclusion

Strengthening of NCD clinics in public health sector, social health insurance schemes, outpatient reimbursement, T2DM self – management education, staff welfare, employees – supportive policies, patient centred hospital/clinic management and positive attitudes of health care providers would allow optimal use of healthcare services by people with T2DM.

Ethical Clearance: The study protocol has been approved by the Institutional Ethics Committee, (IEC No. 453/2016, Kasturba Hospital).

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Conflict-of-Interest: Nil.

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Maternal Awareness and Perception in Successful Implementation of Neonatal Screening Program

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Abstract

Context: New-born Screening (NBS) is gaining the momentum from medical fraternities, but the grass root implementation is yet a far reality. Mothers, the immediate caretakers of their new-borns, play a pivotal role in healthcare decisions of their neonates which directly relies on their knowledge and perspectives on health literacy.

Aims: To understand the role of maternal awareness and perception in implementation of NBS for inborn errors of metabolism (IEM).

Methods: This qualitative study design adopted purposive sampling to recruit thirty-five postnatal mothers on third day post-delivery from general wards of tertiary care hospital. Mothers were interviewed using semi-structured questionnaire.

Results: Lack of awareness, strategic outreach programs, government initiatives in mothers and associated economic issues posed a major challenge in the implementation of nation-wide NBS program. Post intervention of health literacy on NBS and IEM, most mothers were eager to both participate and advocate NBS at par with goals of the action component for comprehensive NBS module designing. Counselling services for NBS, when offered antenatal and postnatal period, created an acceptance rate that was dependent on the affiliation of the competent authority involved in the counselling and information dissemination process and the setting in which the counselling intervention was administered.

Conclusions: While there exists a considerable knowledge deficit on disorders of new-born and the importance of early screening, the affiliation of the counsellor influenced mother's perception. This emphasizes the radical need for antenatal counselling, outreach programmes by healthcare professionals to ensure success of NBS; the goal of limiting neonatal morbidities arising from IEM, a reality.

Keywords: Congenital disorders; metabolic disorders; mothers' perceptions; neonatal screening; sustainable developmental goal 3

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Introduction

The fourth Millennium Development Goal emphasizes the international commitment to measurably reduce neonatal and child mortality. The neonatal period, the first golden 28 days after birth, represents the most crucial and vulnerable period which determines survival

and healthy development of the new-born¹. Inborn errors of metabolism (IEM), comprising of a heterogeneous cluster of over 500 disorders, originates from defective and dysfunctional intermediary metabolic pathway. IEMs contribute a significant share to the global infant morbidity and mortality rates. Though individually considered rare, cumulative incidence of IEM spectrum disorders is hugely underestimated, with an estimated prevalence of all-cause IEM to be 50.9 in 1,00,000 live births, case fatality rate of 33% or higher, accounting for 0.4% (23529 deaths/ year) of all child deaths worldwide². Approximately 0.9-6% of all Sudden Infant Deaths (SID) cases involve IEM. Literature identifies at least 43 IEM associated with SID, 26 of which can already present during the neonatal period, with at least 32 treatable disorders and 26 are currently detectable by state of art laboratory diagnostics³.

Often, adverse and fatal clinical consequences of congenital metabolic disorders are preventable if diagnosed and intervened early. Timely intervention offers reversal and/or halting progression of potentially life-threatening complications⁴. With no recent published data on accurate prevalence of IEM in India, the incidence is estimated based on different small-scale funded projects as one in 1000 live births⁵. Despite constant recommendations and regular publications since 1980s from the Paediatricians, Geneticists, and Diagnosticians, new-born screening(NBS) practice is not yet a standard of care in the Indian Context⁴⁻⁹. There is huge need to understand and address the cause for the delay in the implementation of NBS as a public health program. Success strategies of NBS for congenital metabolic disorders in global context including some of the developing countries inkled the need for the equal involvement of the immediate beneficiaries of the program. The knowledge on the role of perceptions and awareness on NBS for metabolic disorders can bring clarity to existing reluctance to the screening from parents and may assist in developing outreach programs/ strategies to help promote NBS.

Parents, the immediate beneficiaries of the NBS program, are the primary caretakers, and make decisions on seeking health care services for their new-born. The study aims to gain insights on the major challenges in successful implementation of NBS program for IEM as national health program and address those in having an

established screening module.

Methods

Qualitative study was undertaken in a tertiary care hospital ensuring participants' representability from the southern coastal and Malnad belt of the Karnataka. Postnatal mothers on third day post- delivery were recruited from general wards based on convenience and purposive sampling. Participants' eligibility was identified by the LL when he attended neonates for routine check-up. Ward Nurse introduced interviewer to the 70 mothers aged between 20 and 34 years. PS read the participant informed consent for the interested mothers and interviewed (in either English or Kannada) using semi-structured interview.

Literature evidence driven conceptual framework with key domains that can cover most of parental attitude and health behaviour were constructed which were incorporated into interview guide and administered after being validated by experts and piloted on participants.

High dropout of 50% can be attributed to the vulnerable phase (day 3 post-delivery) during which the interview was conducted. At a time considered prime from achieving maternal and neonatal stability and a period physically and emotionally sensitive for a new mother, an interview or awareness outreach on NBS was an unnecessary marketing strategy rather than an essential standard of care.

Participants were assessed on their baseline awareness and knowledge about new-born and antenatal screening and their demographic features in the first five minutes. This was followed by briefing on screening methodology & IEM disorders (approximately five minutes). Post-intervention, participants were interviewed for their attitude and perception (approximately 15-20 minutes). Reflective transcript completed immediately after each interview were reviewed by the participants themselves.

Analysis

Interviews were conducted until informational saturation was obtained in every domain. All audio recorded interviews were transcribed verbatim, Kannada verbatim were translated into English for the ease of analysis. Couple of transcribed verbatim were coded separately by each of the authors and compared

for the uniformity. The data were coded using both deductive (conceptual framework) and inductive approach (constant-comparative based approach), thus enabling the generation and further exploration of both anticipated and emergent themes. Demographic data and participants responses (anticipated and emergent themes) were presented using descriptive statistics.

Post qualitative data analysis, the challenges and the benefits (themes generated) were addressed in a comprehensive counselling module and administered to four thousand mothers both during antenatal (gestational age of 32 weeks and more) and post-natal period (third day) PS, briefed the information pertaining to NBS & IEM and the potential health benefits to these mothers along with a team of nurses and a neonatologist.

Findings

Though 35 mothers consented for the study, informational saturation was obtained at sample size of 15. However, the interviews were not ceased, continuation for all the consenting participants was carried out to ensure the appropriateness and adequate recruitment based on heterogeneity like different

demographic features. presented in Table 1 . Table 2 presents the four major themes generated.

As presented in Figure 1, the status of maternal awareness on NBS prior intervention was indeed poor and below the expected benchmark. The primary challenge in implementation of NBS, descriptive statistics of the key responses of interview, most of which are emergent themes, are represented in Figure1. Figure 2 represents the theme; participants' keenness to support and advocate NBS, post-intervention.

Post qualitative data analysis, of four thousand pregnant mothers who were counselled during antenatal and post-natal period, 3510(87.75%) mothers consented to new-born screening. All consented were counselled by PS and a team of two nurses during their antenatal period followed by a reemphasizing health literacy administered by neonatologists during the routine postnatal check-up. 0.26% of consented and 12.25% (490) non-consented missed one of the counselling sessions, with the post –natal neonatologist's advocacy session being the major session to be missed which could be attributed to the complications and vulnerabilities of the post-natal phase.

Table 1: Participant characteristics

Participant characteristics		Sample size (n=35)	Frequency
Age Mean age = 28.64 years (SD 4.006)	20-29 years	21	60%
	30-31 years	14	40%
Education	middle school	3	8.6%
	high School	8	22.8%
	PUC	8	22.8%
	graduate and above	11	31.4%
	Nursing GNM and BSc	5	14.3%
Occupation	house-wife	28	80%
	working	7	20%
Socioeconomic status	BPL	9	25.7%
	Lower	6	17.14%
	Middle	20	57.14%

Cont... Table 1: Participant characteristics

Parity	1	24	68.57%
	2	10	28.57%
	3	1	2.85%
Consanguinity	1st degree	1	2.85%

Table 2: List of themes generated

Themes	Codes
Lack of awareness	Knowledge on IEM
	Knowledge on NBS
Lack of outreach programs	Choice of suitable time for counselling/advocacy campaigns/outreach programs
	Counsellors affiliation for the knowledge dissemination
Lack of government/nation-wide initiative	Subsidized cost
	Mandating /Health policy
	Advocacy campaigns
Financial burden	Associated economic dimension
	Affordability

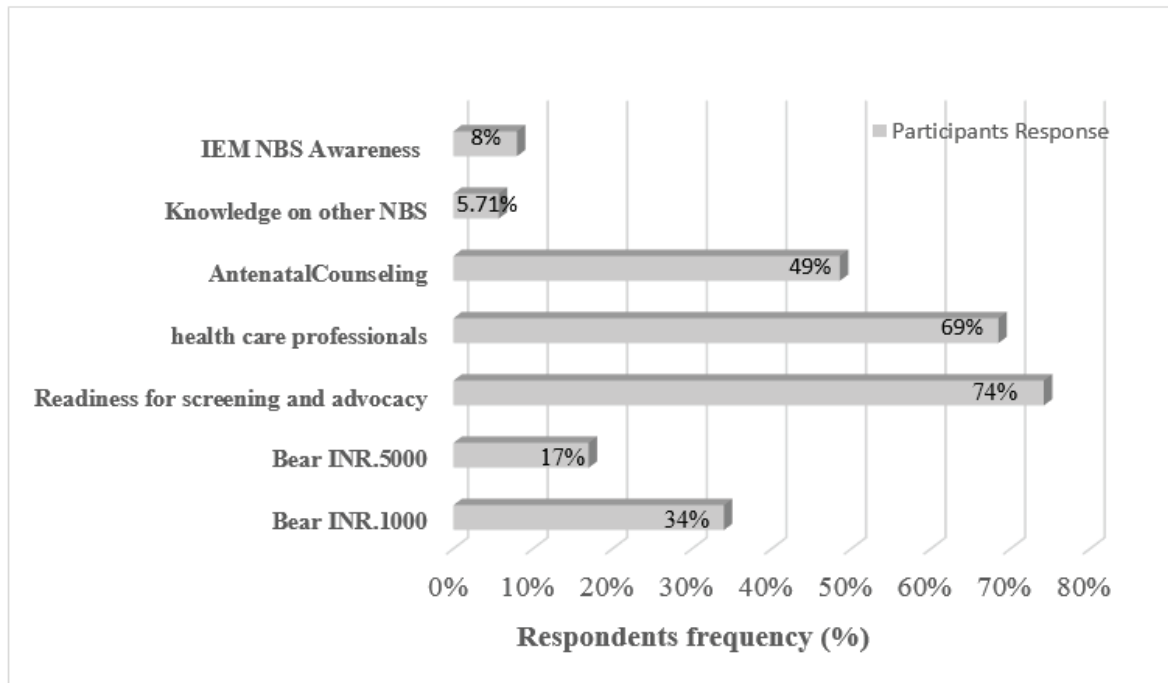


Fig. 1 Key Responses with percentage of respondents

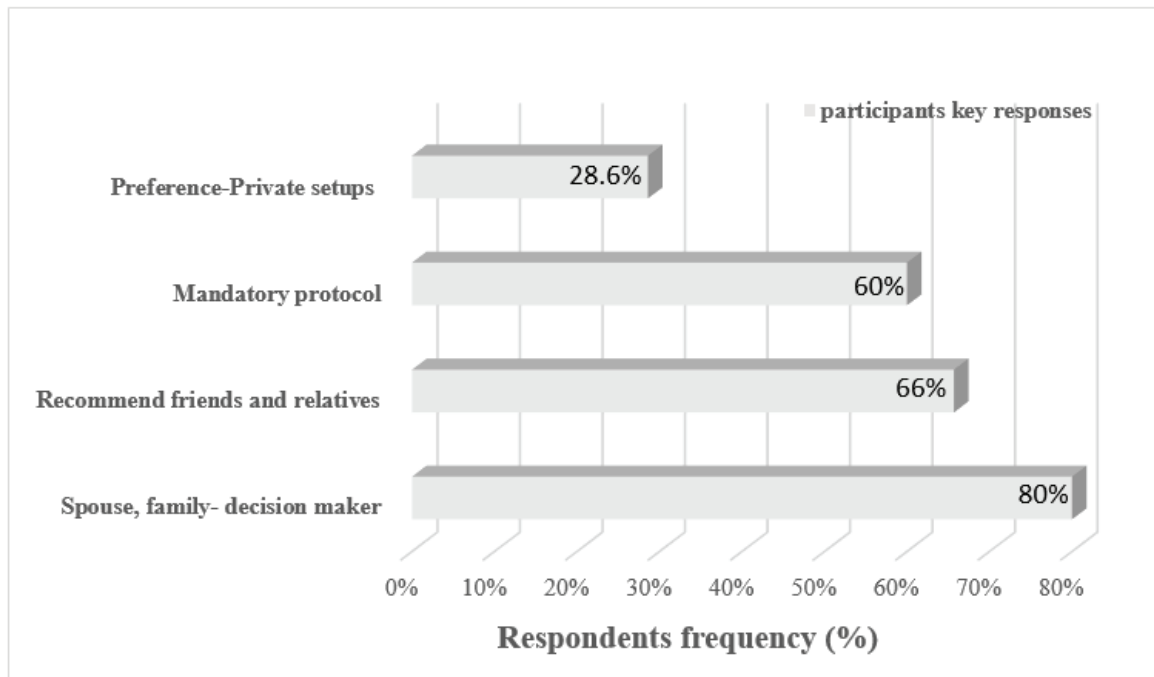


Fig.2 Key Responses with percentage of respondents for the theme; Eagerness to participate in NBS (n=26, f=74%)

Discussion

Although apparently rare, IEM can affect neonatal development and in severe cases can result in neonatal mortality⁴. NBS deals with NBS for potentially fatal metabolic and genetic conditions referred to as inborn errors of metabolism and adversely affects neonatal development. Hence early detection can significantly reduce morbidity, mortality, and associated disabilities. The rationale behind screening remains debatable, particularly for disorders with no treatment options and where treatment is predominantly symptomatic, invasive and aims to retard disease progression rather than prevent or cure it. However, it should be appreciated and emphasized that purpose of screening encompasses prevention, amelioration of disease, facilitation of improved quality of life and addressing preventable morbidities rather than the mere detection of a biochemical/genetic disorder¹⁰.

Ascertaining the views of the community at large and parents, about NBS, forms a critical milestone in the success of NBS programs. Although several factors influence parental views about NBS, parents have been found to be generally supportive when made aware of

the facility and positive attitudes are not necessarily dependent on detailed knowledge of individual disorders constituting the screening panel. Many new mothers are not even aware of the provision of NBS. The lack of information about parental attitudes in relation to NBS has been identified as an area demanding significant and sensitive deliberation. The perspectives of the “mothers” on NBS, their potential concerns and hindrances, aide the development of effective awareness campaigns and modules on NBS thus presenting NBS as an option which rational parents might like to consider.

NBS maybe seen as a potential intrusion at a vulnerable time and if not adequately counselled priorly, seems to be an insignificant burden and remains greatly unrecognized area in the field of diagnostics and healthcare. During the post-natal period, mothers receive a plethora of information on diverse aspects of neonatal care and remain anxious on getting the essentials right for their new-born¹¹. The UK National Screening Committee necessitates providing evidence-based information on consequences of screening to potential participants that assist them in making an informed choice, but it could be argued that if parents

were truly and appropriately informed then choosing to have their baby screened would be automatic¹⁰. Studies have emphasized that the time, the way, and the clarity at which screening information is provided was a critical determinant in shaping a mother's view on the necessity of NBS.

Our results emphasize that mothers considered it effective and beneficial if awareness on NBS is created during the prenatal period as it would enable effective transfer of detailed information and provide an opportunity to address the parental doubts and concerns. Quoting a respondent viewpoint, 'No, I don't have any idea and am not sure whether I will do' who on post intervention about the benefits and need of screening, volunteered to screen her baby and was giving inputs for successful NBS program.

Few mothers were totally dependent on their spouse and in-laws to arrive at any decision though they agreed the need for NBS after informational intervention. Many agreed antenatal screening is essential for both the maternal and neonatal well-being, preferred antenatal counselling on NBS or at least an information brochure about the same in local language.

Government initiative, with subsidized screening cost would be a good acceptable start, according to most participants. Assured and convinced with quality of service, mothers were ready to bear upto 1500 INR in lieu of NBS, irrespective of their family income. However, mothers thought government should bear the expenses completely / subsidize the cost and or should make it mandatory.

The findings clearly elicit the need of policy makers to become an integral part of the NBS initiative and ensure realistic, subsidized and cost-effective NBS, particularly relevant and important in the largely disproportionate socioeconomic population distribution settings of our country.

Further, our study revealed that mothers are okay with heel prick and its momentary pain if it could make a significant difference for their baby. In accordance with this, previous studies indicate that though parents might be "sad" for having their new-born undergo heel prick for NBS, it far outweighs the satisfaction of the beneficial difference that NBS could make for their

neonate by early diagnosis, intervention and improved quality of their life. It is reasonable to anticipate that the attitudes of parents whose child has been diagnosed through NBS would significantly differ from those screened negative and emphasizes the point that "pain" or "sample storage" were only trivial addressable concerns, if appropriate awareness and clarity about the rationale for NBS is provided. The need for ensuring sound health of their baby thus far outweighed any other non-significant concerns.

Findings of study suggests mothers were largely unaware of provision or relevance NBS for IEMs and felt uninformed. Further, mothers opined that awareness on NBS should be provided in the prenatal period in the form of direct awareness through their OBG consultants as well as in the form of pamphlets provided in local languages and community-based outreach programmes. "Pain" or "inconvenience" to the new-born and the family emerged as trivial insignificant concerns if the significant relevance of NBS and its associated procedural concerns are well addressed in advance and there seemed to be an appreciable percentage of mothers opining that the role of government assistance was essential and indispensable in making the success NBS programmes, a reality¹².

Post data analysis of the interview, the challenges and facilitators were addressed in a screening module and its translational outcome/applicability was recorded using observational study design. Four thousand mothers were offered screening services along with counselling. While 3510 mothers, counselled directly/indirectly by their medical team, consented for the screening, the rest did not consent as they considered it an unnecessary burden or even a mere marketing strategy of the diagnostics arena since they were not initiated and introduced to the concept by their medical team. This observation made it very clear that it is just not the counselling (health literacy) but also the affiliation of the counsellor that influences the perceptions and the health seeking behaviours unlike the theory that says knowledge (improved health literacy) alone improves practice.

Conclusions

Hence, paucity of awareness and outreach programs to mothers in their antenatal period and the lack of

government initiative in offering a realistic screening platform emerged to be the main challenges in the road of NBS implementation and success, in our country. If only these prime concerns of the prospective mothers are effectively addressed with the designing of community based and government aided national NBS awareness modules and subsidies, it could bring about a radical transformation in the implementation and success of NBS as a national program. Further, it could make the two essential child health-based targets of SDG 3, a reality.

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Extent of Diabetic Nephropathy Reversal in Type 2 Diabetes Mellitus Patients by following the Freedom from Diabetes Protocol

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Abstract

Introduction - The purpose of the study is to test the efficacy of Freedom From Diabetes (FFD) protocol on diabetic nephropathy patients.

Methods – Out of 776 participants enrolled, 302 had diabetic nephropathy. Selected participants were given a specially modified plant based diet along with lymphatic movement, anti-gravity exercises and relevant supplements to reverse the effects of nephropathy. Baseline characteristics, anthropometric measurements and biochemical parameters were measured on visit 1 and visit 2.

Results - After 6 months, there was a significant reduction in urinary microalbumin and serum creatinine levels which was accompanied by improvement in glycemic control. Anthropometric measurements like body weight and BMI also showed a significant improvement.

Conclusion - This study states that FFD protocol (specifically adapted plant-based diet along with lymphatic movement and anti-gravity exercises) with relevant supplements helps in improving diabetic nephropathy status.

Keywords: Plant-based diet, Exercise, Microalbuminuria, Serum Creatinine, Diabetic nephropathy.

Introduction

Diabetic nephropathy refers to specific pathological, structural and functional changes seen in the kidneys of patients with type 2 diabetes mellitus (DM). These include the generation of advanced glycation endproducts, proteinuria, microalbuminuria, increased serum creatinine levels, elaboration of growth factors and hormonal changes^{1,2}. DM patients consuming

acidogenic diet generate ketone bodies, leads to metabolic acidosis, which induces insulin resistance^{3,4}. Consumption of a plant-based vegan diet reduces the risk of obesity, DM, and associated diseases⁵. This study discusses the efficacy of FFD Protocol on diabetic nephropathy patients.

Materials and Methods

Subject Selection: It was a single centred cohort study. Out of 776 participants, 302 were having diabetic nephropathy.

Selection criteria: HbA1C > 6.2, Urine Microalbumin > 20 µg/ml, Serum Creatinine > 1.0 mg/dl (males) and > 0.8 mg/dl (females)

Participants with less than two visits were excluded from this study.

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FFD Protocol: The dietary & exercise intervention was carried out in 3 phases.

Phase 1 (Adjustment phase) - It lasted for 4 weeks. Strictly avoid milk and milk products and non-vegetarian foods. Replace local wheat with emmer wheat and white rice with brown/unpolished/semi-polished rice. Diet counselling was done by certified dietician through telephonic and/or personal appointment.

Diet for 1 to 3 mg/dl serum Creatinine –

Early morning: The green smoothie on empty stomach. ⁶

Green smoothie recipe: Leach (cooking leafy vegetables in water) the locally available fresh green leafy vegetables, one low potassium fruit (apple, pear, guava and papaya) and herbs (curry or mint leaves), black pepper and low potassium salt (avoid adding lemon and low sodium salt) in 500ml water.

Breakfast: 50% raw salads (no sprouts allowed) and 50% cooked food made from pulses/lentils or grains on alternate days.

Lunch and dinner: One grain per meal with equal proportion of grain, cooked vegetables and raw salads, and only one serving of pulse/lentil preparation per meal. Include 20 to 25 ml of unrefined cooking oil (cold-pressed/ filtered) per day.

Evening: Nuts and seeds (either 2 tablespoon mix seeds like sunflower, pumpkin, watermelon, sesame, flaxseed and 2 soaked almonds or walnuts).

The diet provided approximately 65 to 70% carbohydrates, 10 to 15% proteins and 20 to 25% fat.

Dietary restriction for serum Creatinine >3 mg/dl – White smoothie on empty stomach. Avoid pulses/lentils and green leafy vegetables in their breakfast.

White smoothie recipe: Bottle gourd/white pumpkin or cucumber (one cup), one low potassium fruit (apple, pear and guava) and herbs (curry or mint leaves), black pepper and low potassium salt in 500ml water.

Dietary restriction for high Uric acid –

Completely avoid spinach black-eyed peas, red lentil, white beans and moderately consume green peas, mushrooms, cauliflower and broccoli once in 15 days.

They were prescribed medications (allopurinol in required doses) and supplements Acetyl Cysteine (150mg) and Taurine (500mg) amino acids. Monthly follow up was done with repeat test results.

Phase 1 exercise (Basic exercises) – It includes following exercises,

World Best Warm-Up (Tapping, rubbing and shaking) – Morning

Antigravity exercises (nitric oxide dump/staircase climbing) – Post 1 hour 45 minutes of breakfast, lunch and dinner.

Nitric oxide dump (alternate arm raise 20 times, squats 8 times, shoulder presses 20 times and non-jumping jacks 20 times) was for those with knee pain or not having access to staircase. The speed and duration of each activity were tailored according to individual capacity.

Phase 2 (Acceleration or aggressive phase) - Low glycemic juices were given in fixed quantities depending on their eGFR levels once a week. (Table 4) Larger quantity of smoothie, nuts or salads were allowed if feel hungry. Participants with BMI >25 did it for 8 weeks, those with 23-25 did it for 4 weeks and those with <23 were not allowed to do juice feasting. Glucose levels fluctuate/drops in this phase hence their insulin/medicine dosage was adjusted accordingly.

Juices consumed:

Juice	Time	Recipe
Smoothie	Morning	Refer above recipe
Red juice	Morning	800gm tomato, 250gm purple cabbage, 1 red capsicum, 1 yellow capsicum
Green Juice 1	Afternoon	500gm Ash gourd, half apple, 4 big capsicums, 1 ridge gourd, half lemon juice
Green Juice 2	Afternoon	700gm bottle gourd, 2 cups green sorrel/Chenopodium, 1 cup coriander, half lemon juice
Smoothie	Evening	Refer above recipe
White juice	Evening	500gm bottle gourd, 500gm cucumber, half lemon juice

Phase 2 Cleansing exercises - Yoga-based cleansing exercises like whole system breathing, dhauti kriyas, kapalbhati (150-300 times) along with mild strength-building exercises like lightweight training and/ or resistance band (upper body focused) exercise 15 repetitions each, 3 times a week were introduced. ⁷ Minimum of 45 min of exercise per day was advised.

Phase 3 (Inner transformation phase) – It include the stress release at an emotional level; improve awareness and healing from within. Lasts for 4 weeks and was similar to the phase 1 diet with some flexibility with respect to fruits, white rice or non-dairy sweets depending upon their glucose levels and medications. The duration of each phase vary depending upon the participant's health, needs and adaptability.

Phase 3 exercises (Strength and Stamina building) - Participants were advised based on their liking to further specialise in strength, stamina or flexibility. A weekly proportion of 4hrs of strength, 3hrs of cardio and

2hrs of flexibility was recommended. Continue Phase 1 exercises in lesser duration. For strength and muscle gain advised to join the gym. For stamina, longer walk-jogs, cycling or swimming.

The self-reported demographic data viz. gender, age, family history, dietary compliances and exercise compliance were collected. Weight and height were measured before and after the program in the clinic. The measurements of blood glucose levels, HbA1C, insulin fasting, serum Creatinine, urine microalbumin and uric acid was performed before and after attending the program in NABL accredited labs.

Statistical Analysis - Data analysis was done using IBM – SPSS (Statistical Package for Social Sciences) version 20. Statistical Analysis was done using One-Sample T-Test and Paired T-Test. $P < 0.05$ is considered statistically significant.

Results

There was a comparable number of males (169) and females (133) enrolled in the study. The education of the participants varied with 85.76% being graduates and postgraduates, 7.62% had studied up to 10th and 12th grade, 3.64% were doctorates and the remaining 2.98% were diploma holder (Table 1). The average duration of DM was 13 years. Out of 302, 8 participants belonged to the age group <30 years (Mean – 25.63 years), 200 belonged to the 30 to 60 years age group (Mean – 48.84 years) and 94 belonged to the >60 years age group (Mean - 66 years). (Table 2)

There was a statistically significant decrease in the biochemical parameters like, Urine Microalbumin ($P= 0.047^*$), serum creatinine (males and females) ($P= 0.000^*$) and uric acid levels ($P = 0.000^*$) leading to a highly significant increase in the eGFR levels (males and females) ($P= 0.000^*$). Weight ($P = 0.000^*$) and BMI ($P = 0.000^*$) also showed significant decrease. The weight loss ranged from 0kg to 24.3kg with 50.33% lost weight between 0kg to 5kg, 31.45% losing weight between 5.1kg to 10kg and 7.28% losing weight > 10.1kg. A statistically significant decrease in fasting blood glucose levels ($P= 0.002^*$) and postprandial blood glucose levels ($P = 0.001^*$) was determinant of improved glycemic

control. This helped to reduce the HbA1C levels as well ($P = 0.000^*$) with maximum reduction from 13.3 to 7. (Table 3)

Nephropathy status at visit 2 showed that Urine Microalbumin for participants improved such that 51.39% recorded with normal levels (< 20 µg/ml) (Table 5), 17.43% showed improvement but had levels > 20 µg/ml and 20.57% showed no improvement and/or worsened status. 10.61% were drop outs. (Fig. 1)

Serum Creatinine levels for male participants improved such that 46.93% recorded with normal levels (< 1.0 mg/dl), 27.55% showed improvement but had levels > 1.0 mg/dl and 22.46% showed no improvement and/or worsened status, while 3.06% were dropouts. Serum Creatinine levels for female participants improved such that 41.77% recorded with normal levels (< 0.8 mg/dl), 30.37% showed improvement but had levels > 0.8 mg/dl and 22.78% showed no improvement and/or worsened status, with 5.08% were drop outs. (Fig 1)

The DM status at visit 2 showed that 74.82% had a reduction in the HbA1C levels; such that 54.30% had their HbA1C levels ≤ 7 and 20.52 % had improvement but their HbA1C levels were > 7. Participants with glycemic control status worsened were 25.18%, while 8.94% were dropouts. (Fig 1).

Table 1 – Demographic Characteristics

Education	Frequency	Percent
10th Standard	16	5.29%
12th Standard	7	2.33%
Graduate	179	59.27%
Post Graduate	80	26.49%
PhD.	11	3.64%
Others	9	2.98%
Gender	Frequency	Percent
Males	169	55.96%
Females	133	44.03%

Table 2 – Basal Characteristics

Parameters	N	Mean	Std. Deviation
Diabetes Since	302	13.41	8.23
Age (Below 30)	8	25.63	4.90
Age (31 to 60)	200	48.84	7.42
Age (Above 60)	94	66.00	3.96

Table 3 – Biochemical Characteristics at Visit 1 and Visit 2

Parameters	Before		After		t Value	p Value
	Mean	Std. Deviation	Mean	Std. Deviation		
Urine Microalbumin	134.72	582.48	44.22	62.68	1.9985	0.047*
Serum Creatinine (Males)	1.27	0.32	1.15	0.46	4.1742	0.000*
Serum Creatinine (Females)	1.08	0.41	0.95	0.39	5.1523	0.000*
eGFR (Males)	66.54	14.99	81.14	29.85	-6.1559	0.000*
eGFR (Females)	62.54	17.09	74.4	26.57	-5.8549	0.000*
Uric Acid	5.67	1.49	5.2	1.41	4.7356	0.000*
Weight	71.71	13.3	67.18	13.01	18.7077	0.000*
BMI	26.88	4.2	25.01	4.61	11.7291	0.000*
HbA1C	8.24	1.65	6.9	1.07	15.3137	0.000*
Fasting Blood Sugar	133.04	49.84	123.28	34.76	3.1039	0.002*
Postprandial Blood Sugar	183.59	69.59	154.44	56.86	3.5541	0.001*

Statistically Significant – p value < 0.05

Table no. 4 Fluid requirement on the day of juice feasting

No.	Condition	Total fluid intake/day (ml)	Smoothie split up	Juices spilt up	Water/ green tea (ml)	Salt /day
1	Normal eGFR>90	3000-3500	2 glasses of 250ml	10 glasses of 250ml	500	5gm (normal/rock salt)
2	Mild impairment eGFR 60-90 or Any heart ailment with Ejection fraction >40% or undergone CABG or High uncontrolled BP even on medication	1500	2 glasses of 200ml	4 glasses of 200ml	300	3gm (normal salt only)
3	Moderate impairment eGFR 30-60 or Ejection fraction 25-40%	750	2 glasses of 120ml	4 glasses of 120ml	30	1 gm (normal salt only)
4	Severe impairment eGFR <30 or Ejection fraction <25%	As per nephrologists' recommendation	No smoothie	2 times bottle gourd juice of 100-125ml	As per nephrologists' recommendation	

Table 5 – Albuminuria Classification

Stage	Urine with marked time ($\mu\text{g}/\text{min}$)	24-hour urine (mg/ 24h)	Random Urine Sample	
			Albumin Concentration (mg/l)	Albumin/Creatinine Ratio(mg/g)
Normoalbuminuria	< 20	< 30	< 17	< 30
Microalbuminuria	20-199	30-299	17-173	30-299
Macroalbuminuria	≥ 200	≥ 300	≥ 174	≥ 300

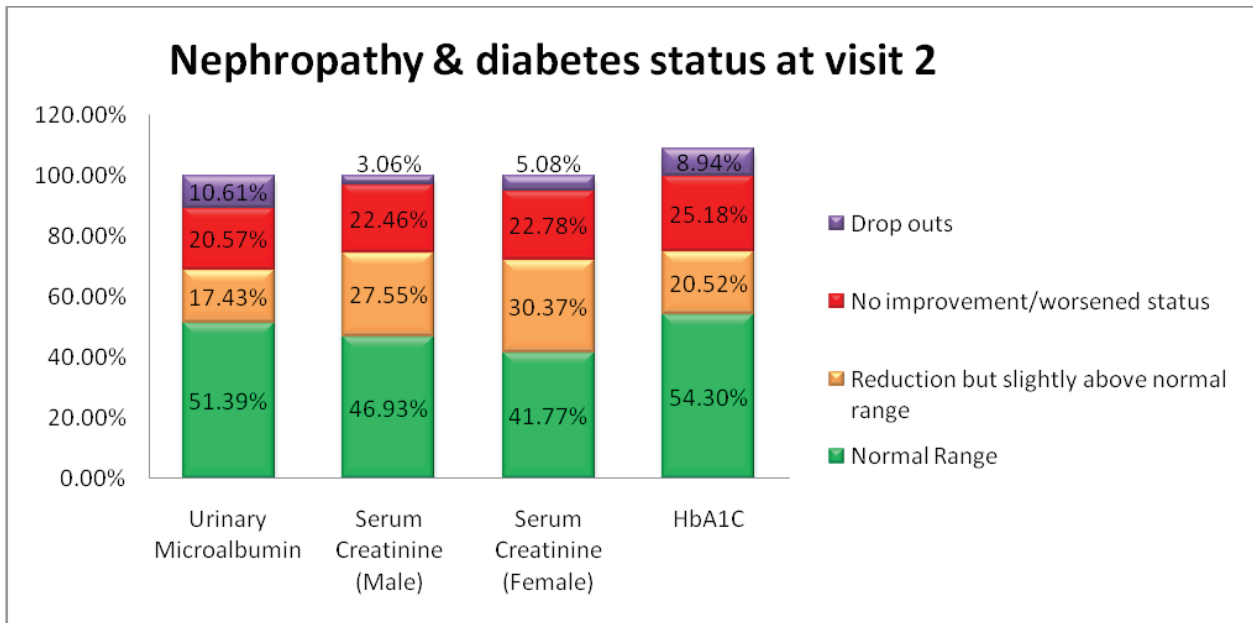


Figure 1: Nephropathy & diabetes status at visit 2 Discussion

Diabetic nephropathy is responsible for 40–50% of all cases of end-stage renal disease.⁴ The present study focused on a specifically adapted plant-based diet and complete muscle activation through antigravity, cleansing and strength/stamina building exercises in a phase-wise manner for improving their health. In the first phase, increased intake of cooked vegetable and a raw salad in lunch and dinner helped in reducing portion size. While in the second phase, juice feasting helps in removing all the toxins from the body and weight reduction. The juices are rich sources of phenolic compounds that are responsible for antioxidative, immunomodulatory and antimicrobial activities.⁹ Juices made from raw vegetable retain all essential antioxidants and enzymes.¹⁰ Enzymes not only aid in digestion but also help all other metabolic processes work properly.¹¹ Different colour of juices was specific for energizing, balancing and healing their corresponding colour related chakras.^{12,13} Like red colour for root chakra (base of the spine), green colour for heart chakra (heart) and white colour for crown chakras (Head).^{12,13} Following this diet regimen helped in improving their blood glucose levels and weight in the second phase than in the first phase. Blood glucose control and weight reduction helps in controlling preexisting chronic kidney disease and preventing a further decrease in kidney function.^{14,16} Insulin resistance reduced by removing milk and milk products.¹⁵ Consumption of milk and milk products, and

animal foods are responsible for high albumin-creatinine ratio leading to chronic kidney disease.^{16,17} Whereas the plant-based protein diet improve kidney function.^{2-4,14,16} Incorporation of smoothie in both phases caused an increased sensation of satiety due to high dietary fibre content, lead to weight reduction.¹⁸ Smoothie is rich in fibre, phytonutrients and antioxidants help in reducing blood glucose levels, inflammation and blood cholesterol levels.^{6,18} Nuts reduces the development of diabetes and are high in monounsaturated fatty acids, polyunsaturated fatty acids, vegetable protein, fibre, vitamins and minerals.¹⁹

Physical exercise training helps in weight reduction and improvement of insulin sensitivity, hyperlipidemia and diabetic nephropathy.^{3,20} In diabetes, nephropathy gets aggravated by down-regulation of nitric oxide. Recently, exercise was reported to up-regulate renal eNOS and nNOS expression. Stepwise implementation of lifestyle changes with vegan diet and exercise leads to 61% reduction in diabetic nephropathy.² Incorporation of amino acids supplements like Acetyl Cysteine (150mg) and Taurine (500mg) protect kidneys from damage and reduce the risk of kidney failure.^{21,22}

This study states that the FFD protocol helps in improving glycemic control along with serum creatinine, uric acid, urine microalbumin which helps in reversal of diabetic nephropathy.

Informed Consent: Obtained from all participants included in the study.

Ethics Clearance: Taken from M.C.E. Society with DCGI Reference No: MCES/EC/548/2019.

Funding Source: Self

Conflict of Interest: Nil

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Synergistic protective effect of acetylcysteine and taurine against cisplatin-induced nephrotoxicity in rats. *Drug Design, Development and Therapy*, 2017;11:901-908.

Assessment of Rotterdam Vs Marshall CT Grading for Prognosis of Head Injury

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Abstract

Trauma is one of the most important issues of most healthcare systems accompanying with head trauma in the most cases. We sought to determine the scoring system and initial Computed Tomography (CT) findings predicting the death at hospital discharge (early death) in patients with traumatic brain injury based on Marshall and Rotterdam CT scores. This is a cross sectional study on traumatic neurosurgical patients with mild-to-severe traumatic brain injury admitted to the emergency department of neurosurgery shyam shah medical college,rewa. Patients ≥ 18 years old with TBI during last 24 hours with $GCS \leq 13$ were included and exclusion criteria were multiple trauma, penetrating injuries, previous history of anticoagulant therapy, pregnancy, not willingness for participation. Their initial CT and status at hospital discharge, one and three months (dead or alive) were reviewed, and both CT scores were calculated. We examined whether each score is related to death using SPSS11 by The Mann–Whitney U at the level of $p \leq 0.05$. Overall, 98 patients were included. Mean age was 43.52 ± 21.29 . Most patients were male (63.3%). Mean Marshall and Rotterdam CT scores were 3.2 ± 1.3 and 2.5 ± 1 . The mortality at two weeks, one month and three months were 19.4%, 20.4%, and 20.4%. Rotterdam CT score was significantly different based on type of hematoma. Median GCS score in alive and dead patients on 2 weeks were 10 and 4 ($p=0.0001$), at one month were 10 and 4 ($p=0.0001$), and at three months were 10 and 4 ($p=0.0001$). The median Marshall CT score on 2 weeks were 2 and 4 ($p=0.0001$), at one month were 2 and 4 ($p=0.0001$), and at three months were 2 and 4 ($p=0.0001$). The median Rotterdam CT score on 2 weeks were 2 and 4 ($p=0.0001$), at one month were 2 and 3 ($p=0.001$), and at three months were 2 and 3 ($p=0.001$). The Rotterdam CT score was significantly correlated with mortality at two weeks, one month and three months ($p=0.004$, $p=0.001$, and $p=0.001$, respectively). The Marshall CT score was not significantly correlated with mortality at any time. The Rotterdam CT score was more accurate for prediction of mortality on 2 weeks (ROC80.9), at one month (ROC80.7), and at three months were (ROC80.7) than The Rotterdam CT score (ROC 76, 74.1, and 74.1, respectively). This study concluded that The Marshall CT score was more accurate for prediction of mortality on 2 weeks, at one month, and at three months were than The Marshall CT score with higher ROC. The correlation of the Rotterdam CT score with mortality was significant.

Key Words: Marshall scores, Rotterdam scores, CT scan, head injury

Introduction

Traumatic brain injury (TBI) is one of the most common causes of death among the young^[1,2]. Due to changing demographics, it is also an increasing risk factor for morbidity and mortality among the elderly^[3]. Upon admission to the hospital, these variety of TBI

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is commonly graded according to the Glasgow Coma Scale (GCS)^[4]—a measure of level of consciousness. Although this is of clinical descriptive value, it does not provide any structural information on potential intracranial lesions. Computerized tomography (CT) is the routine imaging modality used to assess structural lesions in acute TBI, due to its accessibility and speed. The information supplied by the admission CT scan not only allows for diagnostic screening for potential intracranial injuries requiring acute neurosurgical interventions, but also provides important prognostic information^[5]. Currently, several types of CT classification systems exist to prognosticate and stratify TBI patients. Introduced in 1991, the Marshall CT classification^[6] categorizes injuries as different levels of diffuse lesions, based on basal cistern compression and midline shift, or focal lesions, depending on whether lesion volume exceeds 25 cm³. Despite some what arbitrarily chosen cut offs, this classification is still considered to be somewhat of a “gold standard” for TBI classification. While components of the Marshall CT classification have been shown to contribute to outcome prediction in TBI^[7], the Marshall CT classification was not originally designed as a prognostic tool. Thus, in 2005, the Rotterdam CT score was introduced, reweighting components of the Marshall CT classification and adding traumatic subarachnoid hemorrhage (tSAH) and intraventricular hemorrhage^[8], creating an ordinal score. Components from the Rotterdam CT score are today an integral part of the International Mission for Prognosis and Analysis of Clinical Trials in TBI (IMPACT) outcome model for TBI patients^[7]. Therefore, this study was conducted to compare the predictive power of the two methods.

Material and Methods

Inclusion criteria

Patients older than 18 years of age with recent head blunt trauma (e.g., fall, driving accidents or others) within the last 24 hours, and GCS ≤ 13 with abnormal CT scan.

Exclusion criteria

Patients under the age of 18 years, lack of single blunt head injury (including multiple trauma, penetrating lesions), no referral within the first 24 hours, and GCS ≥ 14 . Other exclusion criteria included history of

anticoagulant drugs, pregnancy, underlying cerebral disease (brain tumors or ischemic and hemorrhagic lesions), lack of information or imaging, dissatisfaction.

Clinical evaluation at referral and follow-up

Vital signs were recorded at the time of arrival, 12 hours later, 24 hours later, as well as in the event of unstable state. Brain CT was performed in patients with an indication (after consulting neurosurgery) as emergency cases. All CT scan reports were based on both evaluation systems by radiologist. All surgical procedures and decisions about the clinical approach were performed by a surgeon. Then, the patients were followed up within two weeks from the beginning, the first month and the third month after referral, and the final status of the patients was determined at these intervals.

Statistical Analyses

Data were entered into SPSS 22 software. In the descriptive section, information was classified and summarized using frequency tables and central indexes. At first, normal distribution of data was investigated by Kolmogorov-Smirnov test.

Results

A total of 150 patients were enrolled in the study, 60% male and 40% female. The mean age of the patients was 43.36 ± 21.65 years and most of the patients were over 50 years old (57 patients, 38%). The mean GCS score was determined to be 8.7 ± 3 at the time of admission. In terms of severity of trauma, 52% of patients were belonged to severe traumatic brain (GCS 3-8) and 49% of patients were assigned to the moderate traumatic brain (GCS 9-12) group. The study showed that most patients were referred due to road accidents (73 patients, 74.5%) and fall from height (21, 21.4%). In the next step, we presented the vital signs of the patients at the time of referral, after 12 and after 24 hours. The mean body temperature of the patients was determined as 36.9 ± 2.3 degrees Celsius at the time of admission, followed by the mean systolic blood pressure (105.4 ± 12.1 mmHg), mean diastolic blood pressure (70.2 ± 9.9 mmHg), mean heart rate (96.82 ± 18.12 beats per minute), and mean respiratory rate ($13.89 \pm 3.1\%$ min). The mean body temperature of the patients was determined to be 36.7 ± 0.3 °C in 12 hours, following the mean systolic blood

pressure of the patients (107.77 ± 11.53 mmHg), the mean diastolic blood pressure of the patients (72.6 ± 6.5 mmHg), mean heart rate of patients (92.78 ± 15.7 beats per minute) and the mean respiratory rate (13.7 ± 6.8 per minute). The mean body temperature of the patients was recorded at 36.85 ± 0.2 °C for 24 hours, followed by mean systolic blood pressure in the patients (110.28 ± 9.98 mmHg), mean diastolic blood pressure (73.52 ± 6.8 mmHg), mean heart rate of patients (89.87 ± 13.7 beats per minute) and mean respiratory rate (13.56 ± 6.7 breaths per minute). In examining the frequency distribution of traumatic brain injury, hematoma was most commonly mixed (20.4%), followed by epidural hematoma (17.3%), subarachnoid hemorrhage (17.3%), and intraventricular hemorrhage (15.3%). Based on The Glasgow Outcome Scale, the final outcome of the patients is presented in the second week (or the discharge time, one month later and three months later. Based on the Glasgow Outcome Scale, the final outcome of the patients is presented in the second week or on discharge, one month later and three months later. The mortality rate was 19.4% (19 cases) during the second week (or at the time of discharge), regarding to GOS, most patients had a good return (71 patients, 47.4%). The mortality rate was 20% one month after the submission. The correlation between age and GCS was performed using Spearman test. Results demonstrated that there was no relationship between these two variables ($r = 0.98$, $r = 0.008$). Also, there was a significant positive correlation between the mean score of the Marshall classification and the age of the patients, and patients with a higher mean age had higher grade Marshall Classification ($r = 0.334$, $p = 0.001$). There was no significant correlation between the mean scores in Rotterdam classification and the age of the patients ($p = 0.2$, $r = 0.11$). The median and middle grades in the Marshall Classification were determined as 3 and 3.25 ± 1.3 , respectively, while these values in female subjects were 2 and 3.14 ± 1.2 , respectively. The observed difference was not statistically significant ($p = 0.7$). Regarding the abnormal distribution of mean GCS, the Kruskal-Wallis test was applied to compare different types of hematoma, whereas there was no significant difference ($p = 0.2$). Regarding the abnormal distribution of mean grade in Marshall Classification, Kruskal-Wallis test was used to compare different types of hematoma, which there was no significant difference ($p = 0.09$). With regard to the abnormal distribution of mean score

in Rotterdam classification, Kruskal-Wallis test was used to compare different types of hematoma. However, No significant difference was found between hematoma types ($p = 0.001$). Therefore, the results of the Mann-Whitney test were examined. Based on the findings of this test, there was a significant difference between the mean score of Rotterdam in epidural hematoma and all types of hematomas, including subdural hematoma ($p = 0.001$), intraventricular hemorrhage ($p = 0.0001$), subarachnoid hemorrhage ($p = 0.0001$) and mixed hematoma ($P = 0.0001$). Moreover, no significant difference was observed for intra-parenchymal hemorrhage and hemorrhagic contusion among the subgroups. In the patients after two weeks, the mean GCS score at the time of referral in living and dead persons was determined to be 9.47 ± 2.42 and 4.79 ± 2.79 respectively, the median score of GCS was set at 10 and 4 in live and dead individuals. The observed differences were statistically significant, subjects who died within two weeks had a significantly lower mean GCS score ($p = 0.0001$ and $Z = 5.8$). In the patients after one month, the average GCS score at the referral time of living and dead persons was determined to be 9.53 ± 2.38 and 4.8 ± 2.11 , respectively. The mean score of GCS was also recorded as 10 and 4, respectively, when referring to hospital among living and the dead persons. The observed differences were statistically significant. After one month, the dead persons had significantly lower average of GCS scores at admission time ($p = 0.0001$ and $Z = 5.9$). After two weeks, the findings showed that the median and mean scores in the Marshall Classification in live patients were shown to be 2 and 2.95 ± 1.2 , respectively, while these values were 4 and 4.41 ± 1.12 , respectively ($P = 0.0001$). After three months, the findings revealed that the median and mean scores in the Marshall Classification in live patients were 2 and 2.92 ± 1.1 , respectively, while these values were determined as 4.44 and 1.44 in the dead population, respectively ($p = 0.0001$). The median and mean scores in Rotterdam's classification after 2 weeks among live patients were calculated to be 2 and 2.34 ± 0.9 , respectively. After three months, our findings indicated that the median and mean scores in Rotterdam's classification were determined as 2 and 2.35 ± 0.96 , respectively, and these values were also observed to be 3 and 3.35 ± 1.1 , respectively ($P = 0.001$). On the other hand, Rotterdam's score was significantly associated with patients' mortality in two weeks, after one month

and also after three months ($p = 0.004$, $p = 0.001$, $p = 0.001$). AS a result, the classification of Rotterdam has a higher degree of accuracy .

Discussion

The aim of this study was to determine the predictive power of the initial outcome of patients based on Rotterdam and Marshall scoring in brain CT scans among patients with moderate to severe traumatic brain injury. The most important finding of this study was the higher accuracy of the Rotterdam classification system in comparison with the Marshall Classification System in predicting mortality in the first two weeks, the first month and the third month using the ROC curve¹⁰. Its accuracy has been evaluated in various studies and AUCs (in the range of 0.76-0.68) have been reported with the same pseudo-R² ^{11, 12}. The Marshall Classification was based on the Traditional Coma Data Bank (TCDB) from 1987 to 1984, in which 746 patients with severe traumatic brain injury (GCS 3-8) compared with other classification systems that had the lowest pseudo- variance, adding it to the checklist for patients with traumatic brain injury in admission time does not provide any additional independent information to doctors ¹³. In this study, the The results of the study indicated that, the score of the Rotterdam system was one of the main factors predicting prognosis and was directly associated with the outcome of the patients ¹⁶, which was in agreement with our study. Thelin and colleagues have been selected unfavorable outcomes to compare them with the tools, which suggest the possibility of using the Rotterdam system to evaluate morbidity, in addition to mortality ¹³. The most important finding of this study was the higher accuracy of Rotterdam's classification system as compared to the Marshall Classification System in predicting mortality in the first two weeks, first month and third month with ROC curve. Rotterdam score was significantly correlated with mortality of patients after two weeks, after a month, and also after three months, while there was no significant correlation between Marshall Classification scores with mortality of patients during the above-mentioned periods.

Ethical Clearance- Taken from ethical committee of institution

Source of Funding- Self

Conflict of Interest – Nil

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Early Vs Delayed C-Pap in RDS in Newborns

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Abstract

Background- Early versus delayed initiation of nasal continuous positive airway pressure for treatment of respiratory distress syndrome in premature newborns.

Aims- The prospective study was aimed to compare between early continuous positive airway pressure and late continuous positive airway pressure in premature newborns in case of respiratory distress syndrome.

Methods and Materials- This was a randomized controlled trial where data of 72 preterm neonates with 28-37 weeks were admitted in NICU of Muzaffarnagar Medical College between January 2019- December 2019 were collected and analyzed. Infants were randomly assigned to early CPAP (initiated at half an hour after birth) or to the late CPAP (initiated after half an hour after birth) treatment groups. The primary outcome were need for surfactant administration and need for ventilator support after birth and secondary outcomes was intraventricular haemorrhage and death.

Results- There was no significant difference between the two groups with regard to intraventricular haemorrhage and death. But the need for surfactant administration was significantly reduced in the early CPAP group (P=0.04). Infants in the early CPAP group less frequently required mechanical ventilation.

Conclusion- Early CPAP is more effective than late CPAP for the treatment of respiratory distress syndrome and can be helpful in reducing the need for some invasive procedures such as intubation and mechanical ventilation.

Keywords- Continuous positive airway pressure, premature neonates, respiratory distress

Introduction

The conventional approach of managing premature infants with respiratory distress was intubation, surfactant administration and mechanical ventilation. But, gradually it was soon realized that Continuous positive airway pressure (CPAP) also led to the same final goal of establishing functional residual capacity. It is considered as a well-established mode of respiratory support in

preterm neonates. It is being introduced to minimize the risk of lung injury and also bronchopulmonary dysplasia (BPD). Since its introduction in 1971, CPAP has generally been accepted as one of the most significant advances in the management of infants with respiratory distress syndrome (RDS). Numerous studies have demonstrated the effectiveness of distending airway pressure in improving oxygenation¹. The effects of CPAP includes an increase in FRC, thus improving PaO₂, decreasing airway resistance, reducing obstructive apnea^{2,3} and stabilizing the chest wall and reducing its distortion.

In 1971, Gregory et al.⁴ first demonstrated that the use of CPAP improved oxygenation in newborns with respiratory distress. This observation was followed by

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prospective studies that demonstrated improved survival in premature infants treated with early CPAP^{5,6}.

When used early in the delivery room in extreme preterm infants (gestation <28 weeks), either prophylactic^{7,8} or early rescue⁹, CPAP was associated with 50% reduction in need for intubation, mechanical ventilation and surfactant usage in comparison to 'mechanical ventilation' with or without surfactant.

Mechanical ventilation can damage the immature lung by overdistension produced by excessive tidal volume because of excessive peak inspiratory pressure or prolonged inspiratory time, excessive positive end-expiratory pressure (PEEP) or insufficient functional residual capacity (FRC).

Therefore, the use of CPAP can protect against the development of BPD by avoiding the need of mechanical ventilation and by reducing the risk of bacterial colonization via endotracheal tube (10).

Methods

We performed a randomized controlled study in Muzaffarnagar Medical college, muzaffarnagar from January 2019-December 2019 over 72 preterm newborns. Infants were eligible for **inclusion** if they met the following criteria.

- Babies 28 weeks to less than 37 weeks of gestation.

- Silverman-Andersen score 3 or more in 28 weeks to less than 32 weeks and 5 or more in 32-37 weeks.

- Babies arriving within 6 hours of birth.

Exclusion Criteria-

- Babies less than 28 weeks or more than 37 weeks.

- Babies having apnoeic spells.

- Haemodynamically unstable babies.

- Babies with no sign of respiratory distress.

Investigations such as X-ray chest, Blood sugar, electrolytes, arterial blood gas were conducted.

If neonates arrived within less than half an hour of birth they were categorized as early CPAP group and if neonates arrived late or the consent could not be taken within half an hour of birth they were categorized as late CPAP.

After clearing the exclusion criteria, neonates were assigned to early CPAP or late CPAP treatment groups.

The primary outcomes were need for surfactant administration and need for mechanical ventilation. The secondary outcomes were air leaks, intraventricular haemorrhage and death.

Informed consent was obtained from the parents on pre-structured performa. The study was approved by institutional ethics committee of Muzaffarnagar Medical College.

Statistical Analysis

It was done using intention to treat analysis on SPSS 10. Analysis of continuous data with normal distribution was analysed by student t test and non-normally distributed data by Mann-Whitney U test. Categorical data was analyzed by chi-square test and fisher exact where applicable.

Results

A total of 72 babies were taken with gestational age between 28-37 weeks and were analyzed during the study period.

There was no significant difference between the two groups with regard to intraventricular haemorrhage and death. But the need for surfactant administration was significantly reduced in the early CPAP group (P=0.04). Infants in the early CPAP group less frequently required mechanical ventilation. (Table 1).

Table-1: Baseline characteristics of the 2 groups –:

Gestational age (weeks)	28-32 weeks	32 weeks to 37 weeks	TOTAL
Male	25	14	39(54%)
Female	15	18	33(46%)
Vaginal Delivery	28	16	44(61%)
LSCS	12	16	28(39%)
Minimum weight (gms)	910	1415	
Maximum weight	1855	3840	
Mean weight	1232	2546	
Early CPAP	14	11	25(34.7%)
Late CPAP	26	21	47(65.3%)
Total	40	32	72

Table-2: Outcome variable

	Early CPAP	Late CPAP	TOTAL
Primary variable			
Surfactant administration			21/40 (52.5%)
- 28-32 weeks	6/14 (42.8%)	15/26 (57.7%)	
- 32 -37 weeks	2/11 (18.1%)	7/21 (33.3%)	9/32 (28.1%)
TOTAL	8/25 (32%)	22/47 (46.8%)	
Need for mechanical ventilation			
- 28-32 weeks	3/14 (21.4%)	4/26 (15.4%)	7/40 (17.5%)
- 32 -37 weeks	1/11 (9.0%)	3/29 (14.3%)	4/32 (12.5%)
TOTAL	4/25 (16%)	7/47 (14.9%)	
Air leak			
- 28-32 weeks	1/14 (7.1%)	2/26 (7.7%)	3/40
- 32 -37 weeks	0/11 (0%)	1/21 (4.8%)	1/32

Table-2: Outcome variable

TOTAL	1/25 (4%)	3/47 (6.4%)	
Intraventricular haemorrhage			
- 28-32 weeks	2/14 (14.5%)	5/26 (19.2%)	
- 32 -37 weeks	0/11(0%)	1/21(4.8%)	
Death			
- 28-32 weeks	2/14 (14.3%)	4/26 (15.4%)	
- 32 -37 weeks	1/11 (9.1%)	2/21 (9.5%)	

Discussion

In the present study, we found that the introduction of early CPAP for management of RDS can reduce the need for mechanical ventilation and surfactant administration in pre-term infants. However, early use of CPAP has not been associated with a lower incidence of death and intraventricular haemorrhage (IVH).

Krouskop and coworkers compared two methods of CPAP application in pre-term infants: early CPAP (FiO₂ requirement more than 0.4) and late CPAP (FiO₂ requirement more than 0.7) for treatment of RDS. They did not find any differences in survival or complications between the groups. However, the mean birth weight of their study groups was more than 1700 g, which is less than our patients weight².

In a retrospective study, Gittermann and coworkers found that the early use of n CPAP (applied very soon after initiation of respiratory distress) could significantly reduce the need for intubation and mechanical ventilation without decreasing the incidence of bronchopulmonary dysplasia¹¹, which is comparable to our results.

De Klerk and colleagues showed that early application of n CPAP (usually during 10 min of admission) could decrease endotracheal intubation, surfactant administration and duration of mechanical ventilation, which is corresponding to our results¹².

However, Morley and colleagues randomized 610 infants with a gestational age of 25–28 weeks to CPAP or intubation and ventilation at 5 min after birth, they

found no significant differences in bronchopulmonary dysplasia and death between the groups⁹.

Miksch *et al.* performed a retrospective study to assess the beneficial effects of early CPAP for treatment of RDS in very low birth weight infants. They found that in infants with birth weight less than 1000 g, the use of early CPAP significantly reduced intubation rate, duration of ventilation and incidence of bronchopulmonary dysplasia¹³.

In a retrospective analysis, Thomas, et al.¹⁴ compared the ventilator support strategy (CPAP versus mechanical ventilation) at 24 h of age to predict neurodevelopmental outcomes. After adjusting for illness severity, those on CPAP at 24 hours of life had better Bayley Scores of Infant Development at 18-22 months of corrected age apart from lower BPD and lower mortality¹⁴. In the SUPPORT trial, there was no statistically significant difference in the composite outcome of death or neurodevelopmental impairment at 18-22 months of corrected age in early CPAP group as compared to mechanical ventilation and surfactant group¹⁵.

But the limitation of our study was the small number of study groups and absence of long-term outcomes.

Conclusion

Early CPAP is more effective than late CPAP for the treatment of respiratory distress syndrome and can be helpful in reducing the need for some invasive procedures such as intubation and mechanical ventilation.

Ethical Clearance- Taken from Institutional Ethics Committee, Muzaffarnagar Medical College

Source of Funding- Self

Conflict of Interest- Nil

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Determination of Gestational Age by Fetal Kidney Measurements in Pregnancy

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Abstract

Introduction: In a country like India, where ultrasonograms are an important part of the diagnostic and monitoring protocol of a pregnant female, obstetric sonograms are the go-to modality for fairly accurate gestational age detection incorporating multiple parameters. We conducted the present study to analyse the use of fetal kidney length for estimation of the gestational age as a discrete as well as adjunct parameters.

Material and Methods: In present study, sonographic assessment of 95 women with single intrauterine pregnancies was done. Kidney length (KL) was measured as maximum cranio-caudal length in all patients. Other parameters like head circumference(HC) and femur length(FL) were assessed. The data was analysed with IBM SPSS Statistics software. Chi-square test and student t test were done to assess level of significance.

Results: The mean kidney length was found to be varying from 25.35±2.52 mm at 24-26 weeks to 39.17±2.22 mm at 36-38 weeks. as the gestational age progressed, a linear correlation between the kidney length and the gestational age was appreciated.

Conclusion: Fetal kidney length can be used as an adjunct and potential discrete parameter in estimation of fetal gestational age in late second and third trimester.

Keywords: Gestational, Age, USG, Fetal, Kidney length

Introduction

One of the assessments essential to deliverance of optimal maternal care is precise gestation age calculation. The diagnosis of growth disorders and timing of delivery date is wholly dependent on the estimated gestational age and sonographic evaluation⁽¹⁾. Iatrogenic post-maturity and prematurity directly result from wrongly estimated dates and gestational age calculation.

There are many instances where women present for the first obstetric evaluation, later in pregnancy and

are unsure of their last menstrual period date, in such cases the dating scan proves to be an important tool in establishing the estimated delivery date.⁽²⁾

Since the advent of sonography and its widespread application in dating of gestation, many dependable techniques have developed and have been incorporated in a routine study of pregnancy. In the first trimester, gestational sac diameter and crown rump length are most commonly used. In second trimester, biparietal diameter, femur length, head and abdominal circumference are assessed. however, these indices become progressively unreliable in later stages of pregnancy⁽³⁾⁽⁴⁾. Also, there are discrepancies in predicted gestational age in fetuses which are short for gestational age and have various degree of intrauterine growth retardation.

Adrenal glands along with fetal kidneys are evident in a sonogram beyond the gestational age of 9 weeks.

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They can be visualised on either side of the fetal spine. The fetal kidneys are echogenic in the early weeks, and gradually turn hypoechoic in the later weeks when compared with the adjacent bowel and liver⁽⁵⁾. The fetal kidney should be seen in all fetuses in the anomaly scan, whereas it tends to be seen in 80% of the cases at 11 weeks and in 92% of cases at 13 weeks of gestation. ⁽⁶⁾

The renal system is radiologically perceptible in 14th week and by 17th week, either one or both kidneys can be identified in 90% of cases and by 20th week in about 95% cases. Although like all organs, even kidneys are susceptible to growth variations, these variations primarily affect anteroposterior and transverse diameters. the length of the kidney is relatively spared from the growth deviations, even in fetuses who are small for gestational age.⁽⁷⁾⁽⁸⁾

Many studies have been conducted on similar lines for correctly estimating gestational age with various mensuration such as fetal kidney length of which, kidney length has proven to strongly correlate with gestational age in the later stages of pregnancy viz. beyond 20 weeks. Therefore, this study was conducted in department of Radiodiagnosis to establish the validity and reliability of the kidney length in the dating scan and accurately estimating the estimated delivery date.

Integration of this measurement is possible in the existing dating scan algorithm and it has a manageable learning curve, especially when taken in gestation beyond 20 weeks, more so in those where measurement of biparietal diameter and femur length is not feasible.

Materials and Methods

Our cross-sectional study was conducted in the department of Radiodiagnosis and Imaging, PBM Hospital, associated with Kalinga Institute of Medical Sciences, Bhubaneswar over a study period of one year from Jan 2018 to Jan 2019. We included a total of 95 pregnant women belonging to various ages and different parities.

We evaluated the patients on the basis of history, routine antenatal investigations and Third trimester sonograms. the parameters acquired were Mean fetal kidney length, head circumference, femur length, abdominal circumference and biparietal diameter. Van

vuuren et al proposed a nomogram for fetal kidney length, using which the gestational age was evaluated.

This Estimated value was compared with the actual dates considered as definitive.

The subjects were informed regarding the study at the time of appointment for the scan and informed consent was taken regarding the same.

Inclusion criteria

1. Patients undergoing routine sonographic evaluation of pregnancy beyond 20 weeks of gestation.
2. Patients who are certain about their last menstrual period date.
3. Pregnant married women without any accompanying risk factor.
4. Pregnant married women undergoing USG test done before between 8th to 10th weeks of gestational age

Exclusion criteria

1. Patients with fetal anomaly.
2. Pregnant women who are unsure about their last menstrual period date.
3. Patients with intrauterine growth retardation.
4. Renal anomalies or known case of renal anomalies
5. Pregnant diabetic, HTN and pregnant females with eclampsia.
6. Twin pregnancies or Multiple pregnancies.
7. Dilatation of renal pelvis measuring 5 mm or greater.
8. pregnant women having oligohydramnios (<8cm deepest pocket) and polyhydramnios (>25 cm deepest pocket)

Ultrasonogram equipment used was Philips Affiniti 30. Using curvilinear transducer of 5-7 Hz kidney length was measured in craniocaudal axis. Also, analysis of femur length and biparietal diameter was done. Kidneys were identified in the longitudinal axis in the paraspinous gutters and axial and longitudinal sectional images were

acquired. All the measurements were done by two skilled radiologists and were repeated thrice by each radiologist. Maximum fetal renal length was measured when the kidneys were visualized in sagittal plane from upper pole to lower pole, in parasagittal gutter of the fetus.

when the probe was rotated with a 90-degree rotation the long axis of kidneys was measured. After compilation of all the data, statistical analysis was done using SPSS 2.0 software. Level of significance was calculated using Chi-square test and Student t-test. P- value of <0.05 was considered significant.

Results

TABLE 1 Distribution of cases showing Kidney Length (KL) for various gestational ages.

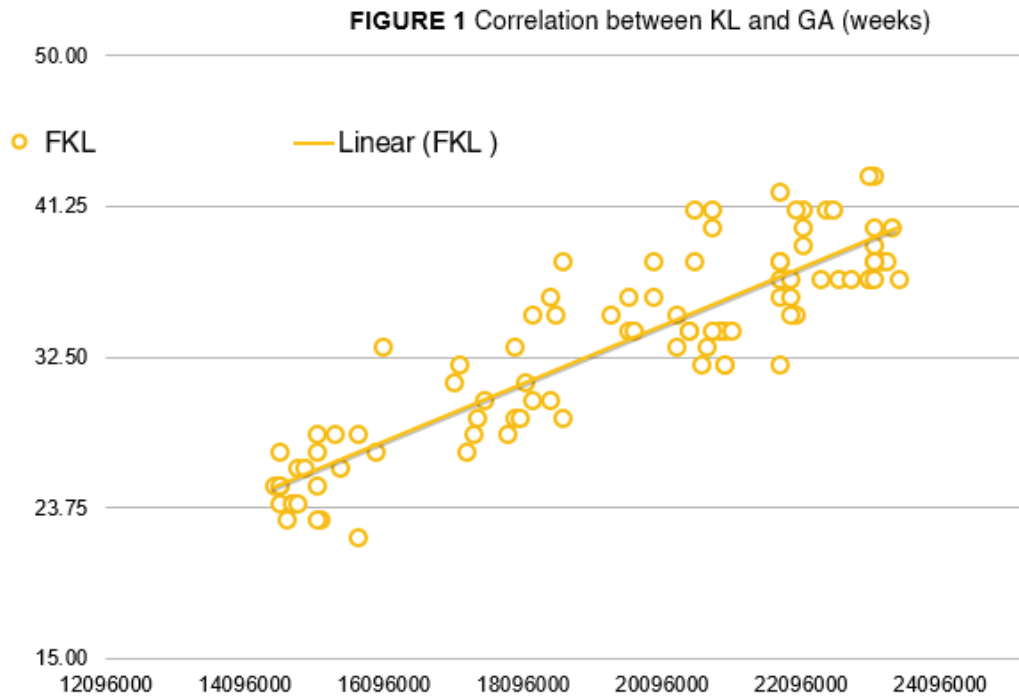
	Mean KL (in mm)	Standard Deviation SD	Confidence Interval	Standard Error SE
At 24-26 weeks				
KL	25.35	±2.52	1.05	0.053
At 28-30 weeks				
KL	30.73	±3.07	1.42	0.725
At 32-34 weeks				
KL	35.20	±2.65	1.10	0.565
At 36-38 weeks				
KL	39.17	±2.22	0.75	0.386

Out of the 95 cases studied, most of the cases belonged to 36 to 38 weeks gestational age group. The mean kidney length was measured to be varying from 25.35±2.52 mm at 24-26 weeks to 39.17±2.22 mm at 36-38 weeks. As the gestational age progressed, a linear correlation between the kidney length and the gestational age was appreciated. As compared to previous studies our study did not show much variation in standard

deviation with increasing gestational age and the kidney length progressed corresponding to the standard biometry as well as clinically calculated gestational age. On regression analysis, a strong correlation was found between the kidney length and the gestational age with correlation coefficient of 0.89 and p value.

TABLE 2 Regression analysis between KL and GA

	Intercept Estimate	Slope Estimate	Correlation	p-value	Conclusion
KL vs GA	0.57	0.1451	0.89	<0.001	Strong Correlation



Discussion

In countries like India where the rate of maternal mortality is very high, there is a need for accurate diagnostic and management protocols for maternal and perinatal pathologies. Regular sonological assessment is a widely accepted modality for dating and ruling out gross intrauterine anomalies(9). among the sonologically assessed parameters, there is a wide variety of indices that can be evaluated(10). Although multiple factors are studied during the obstetric sonogram which are already established to be valid, there is a constant search for those which are least affected by the pathological processes such as growth retardation.

These diagnostic techniques, especially the ones assessing the fetal growth and delivery date estimation for best obstetric outcome, need to be simple, accurately replicable and easily incorporated in the existing protocol for a wide scale implementation into the regular obstetric evaluation by ultrasound.

We studied a total of 95 healthy pregnant females with single uncomplicated pregnancies and the results favored a correlation of gestational age with fetal

kidney length. Using regression analysis, we were able to articulate a linear association during the second a third trimester of pregnancy between fetal kidney growth and gestational age. Statistically, the drawn data between the fetal kidney length and the gestational age was found to be significant pointing towards an association between the two. The correlation coefficient for the third trimester was calculated to be 0.89, which is at par along with other parameters studied (BPD, HC, AC) for computing the gestational age.

Although the kidney size was influenced by various growth disturbances, it was found that these variations are primarily limited to the transverse and the antero-posterior diameters, sparing the crania-caudal length of the kidney. Information regarding these measurements can be used in the early diagnosis and management of a spectrum of kidney abnormalities along the precise delivery date estimation⁽¹¹⁾. In our study all the patients evaluated were of eastern Indian population. We charted a nomogram for the studied population which has potential to serve as a baseline study for this population. Such nomograms can be developed for separate ethnicities to predict the gestational age.

A review of previous studies which evaluated the variability of fetal kidney length to the gestational age indicated a similar outcome. The kidney lengths delineated by Cohen et al.⁽¹²⁾, Konje et al.⁽¹³⁾, Lawson et al.⁽¹⁴⁾, Kiran et al.⁽¹⁵⁾, Kansaria et al.⁽¹⁶⁾ Chatterjee et al.⁽¹⁷⁾ were slightly lesser than our values.

The values for the fetal kidney length at different gestational ages was higher than the study of those reported by Indu et al.⁽¹⁸⁾ and Peter et al.⁽¹⁹⁾. The present study depicted that the length of kidney in millimeter corresponds to the gestational age in weeks.

The inconsistencies in the result could be attributed to a few diverse influences including:

- Operator variability (multiple and 1 or 2 skilled operator)
- Valuation of gestational age (extracted to 2 decimal points and rounded off)
- Resolution of instrument used
- Ethnic variances.

Our fetal kidney lengths were formed using cross sectional statistics. They are not fit for arbitrating the relevance of the development of kidneys longitudinally across time. They are suitable for matching kidney size at an identified gestational age with normogram data. Some observation errors can occur in getting the fetal kidney length dimension, another main cause of errors are possible regarding uncertain end points and askew, oblique images of the kidneys.

The fetal suprarenal gland is comparatively sizeable, and is challenging to differentiate it from the kidney, because of the lack of perirenal fat and a comparable echotexture. This can cause false increase in the measurement of the kidney. These potential errors were not assessed in this analysis.

Apart from the described thinkable technical and observer errors, the measurements acquired in the present study were reasonably accurate. Our analysis therefore corroborates the recommendation that the fetal renal cranio-caudal length can be taken into consideration as an significant ultrasound parameter for accurate estimate of gestation age.

Conclusion

Fetal kidney length can be used as an adjunct and potential discrete parameter in estimation of fetal gestational age in late second and third trimester. Fetal length in millimeter correlates well with fetal gestation age in weeks, however in later gestation the fetal kidney length is generally higher than the gestation age.

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Ethical Clearance: Taken from Institutional Ethics Committee.

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Best Remedy: Effective and Safe Therapy as Guided Imagery in Cancer Patients

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Abstract

Guided imagery is one of the powerful tool for relaxation of mind and body which convert into relaxed and calm state. It is a simple, safe and self-awareness technique used for the individuals or group of persons. Guided imagery have many health related benefits like relieve pain, nausea, stress, anxiety, lower blood pressure so on. And also strengthen the physical, mental, emotional well-being. **Method and materials:** Different sessions, music, images, worlds, exercises is used by the therapist. The session starts with the relaxation, breathing exercise which helps to increase the attention of mind. In the technique the practitioner guide the clients and tell them to relax progressively of different parts of the body (Example- feat ankle, then knees and so on). **Result:** According to research studies the guided imagery is an effective or supportive therapy in Cancer patients as proved. By practicing guided imagery 20 to 30 minutes daily in their live it relax the mind as well as reduces the symptomatic problems like pain, nausea, stress, anxiety related to cancer. **Conclusion:** Guided imagery significantly reduces all the stressful stimuli and makes client with well relaxed and calm mind. Especially cancer patient who are fighting with cancer cells in their body showing maximum symptoms related to adverse effects of treatment. For cancer patients Guided Imagery is a best remedy supportive treatment or technique to relief from various problems which in turn make their life betterment with copying harmful crises.

Keywords: *Guided Imagery, Relaxation, Mind, Body, Cancer Patients, Pain, Stress*

Introduction

Guided imagery is one of the effective and powerful gentle techniques that focuses and guides the imagination. Many challenges face the practitioner or clinician in providing the supportive care to cancer patients. Guided imagery is a knowledge intervention that has been delivered with raising frequency as a curative option for many upcoming difficulties related to cancer patients. In this technique mind and body connection will take place and interact each other thus enhance the persons overall health and well-being. Guided imagery therapy uses words and images which help to divert the attention from the anxiety, stress, fear, pain and also strengthen the inner body naturally. In Cancer patient usually fights with disease related signs and symptoms such as pain, nausea, vomiting, stress, anxiety and fear. So Guided imagery is one of the best remedy to handle these problems according to psychologists and physician

tells that thousands of loyal immune cells come out of the thymus glands on identifying which intern destroy the unsuspecting cancer cells.¹

Definition:

1. According to the Achterberg Guided imagery is defined as the thought process that invokes and uses the senses, vision, audition, smell, taste the senses of moment, position and touch. It is one of the communication mechanisms between perception, emotion and bodily changes.²

2. According to many psychologist and physicians Guided imagery is also called as visualization. It is a technique in which a person imagines pictures, sounds, smells and other sensations associated with reaching a goal. Imagining starts in an situation or specific environment that can activate sense of feeling effective

by producing a physical or psychological aspects.²

History:

In the past 18th century Franz Mesmer introduced the hypnosis that the space to guided imagery. The ancient Greeks introduce the trance experiences which are used in vehicles for physical illness or mental illness. In 1950's the American Medical Association and the American Psychiatric Association identified the hypnosis as a formal tool. Over the past 25 years, the successful guided imagery has been introduced through research findings that show its positive impact on health, performance and creativity. Roughly 10 years later the guided imagery therapy was discovered through the integrated efforts of physicians and psychologist including Stephanie, Simonton and Carl, Roberto Assagioli, Lrving Oyle, Frank Lawlis, Jean Achtenberg and Rossman.⁴

The technique of psychodrama called Jacob Moreno's established in 1940's it is directly linked to guided imagery. In the year 1970's Dr Martin roseman and Dr. Bressler David have been developed for guided imagery as an ultimate approach for the treatment of cancer, chronic pain, stress, anxiety and serious mental illness. The discovered work has been came into the practice academy of guided imagery in 1989. In the 1980's throughout the number of health professionals like Ulrich, Lestie, Helen were started to publish materials related to effectiveness of positive responses of guided imagery on certain health illnesses like physical and mental aspects. Currently guided imagery is an effective developed therapy in alternative or complementary medicine and so many studies shows often helpful in therapeutic process.³

How Does It Help?

Since from 25 years the guided imagery is has been used in positive impact on health performance and creativity. In this technique the experts uses own imagery or before created listening to imagery that will enhance divert, edit, change or convert what is offered for and what is needed. So that guided imagery is a right-brained activity by using or practicing can reduce blood pressure, reduces cholesterol, pain etc. It mobilizes unconscious to pre-conscious process to act with conscious goals, so it can convert much more individual

strength and motivation to accomplish a desired end. Hence by using edit imagery it is an effective technique tells some research studies that reduces or relive the side effects of chemotherapy in Cancer patients that is nausea, vomiting, fatigue and stress.⁴

Mode of Action:

Early pioneers Green and Green, on guided imagery first research proposed psycho neurological theories related to imagery on healing. The researcher explain about mechanism of guided imagery that when the mind shuts it recreates an image of various emotional, physical or mental behaviour, a downward to upward self regulating feedback technique takes place. This process integrates the limbic system, cerebral cortex and hypothalamus which turn autonomic nervous system. When the patient stimulated in deep relaxation state the imagery sequence begins by creating mental image that influences the limbic system. Usually the pain stimuli are transferred through the substantia in the dorsal horn of spinal cord that act as gating mode. By use of guided imagery transmission of painful stimuli are closed at the gate before reaching maximum stage of conscious awareness.⁴

Levetal and J.Johnson proposed that patient experiencing a stressful condition may initiate coping actions which regulate action to both sensory stimuli, emotional and stressful stimuli which in turn reduces pain. Thus the mind is a measure tool and tremendous effect on the body. Example if you think about you that you are sleeping on the beach at Goa, your body responds and takes you in such as way that you're actually laying on the beach in Goa. As the positive imagery acts on body-mind and action takes place to relax by involving all the systems of the body.⁵

Procedure of Guided Imagery:

Hypnosis and guided imagery resembles same but in the guided imagery technique there is a communication between the guide and the client may occur but in hypnosis the interaction is not required. The procedure of guided imagery is usually starts and ends with 20 to 30 minutes. The session starts with exercise of relaxation which helps on focusing the attention of mind. In the phase of relaxation the guide stars teaching the client to relax gradually at different parts of the body such as feet,

ankle, and knees etc.⁶

The common dialogue is used in Guided imagery keep your eyes closed when you take a deep breath, and imagine by your own in the relaxation mood, beautiful thought makes you relax up. There are many ways to think for relaxation and peaceful. Example walks in the garden or spend a day on a beach. By this practicing relaxation will achieve through the active imagery that intense cope up with relieving the pain nausea, stress, anxiety etc. Guided imagery is an effective technique where we can use in all settings including individual or group. If once the procedure is learn it can be practiced independently without the guidance of the guide. Guided imagery Ready scripts or steps are available in the internet or books. The therapist uses various aspects of process which relax and connect the mind and body such as peaceful environment, nice aromas, silent sound and textures. Guided imagery is developed to impact the mind and the body, breathing techniques by controlling and relaxing the muscles thus it creates a state of calm and relaxed mood.⁷

Guided Imagery Sessions:

Guided Imagery can be obtained from home with the help of audio recording or books or by trained therapist. Guided Imagery can be practiced with individual or group sessions.⁸ The sessions complete in 20 to 30 minutes the guided imagery sessions are as follows:-

- The guider uses any one of the different guided imagery techniques that will enhance imagery experiences in the mind.
- The guider will direct you to imagine a place or situations that will enhance to feel relax, safe, peaceful etc.
- Guider uses melody music background that will enhance to help for avoiding mind distraction.
- The guider ask you to imagine something warm healing light on the area where the immune system attacking cancer cells. In this the other uses the exercise which is popular by involving picturing tiny pacman role which represents catching and eating cancer cells.
- The guider directs you to focus on imagined situation that starts to experience feelings and sensations,

such as lightness, strength, warmth or contentment.

Methos / Elements of Guided Imagery

The physicians, psychologists and other health professionals are using guided imagery sessions in some cancer centers according to research studies the main method in guided imagery is as follows.

1. The Simonton Method: Clients who are suffering from cancer they always fighting with harmful cancer cells. Here ask the clients to take relaxed regular breath deeply with imagination of soft cloud healing energy, and ask them to feel healing spreads full of the body.⁹

2. The Palming Method: In this method colours are used for imagination, which each colour represents the different things. Ask the client to close their eyes with hands and imagine a colour that you feel. For example if the client is thinking brown colour on imagination that represents the fear. So when the client suffers from various problems like pain, anxiety, fear, stress, etc. The same client think of colour according to their condition so ask the client to imagine that present colour slowly and when healing process starts automatically the replacement of colour occurs and changes in imagination. By this method the symptoms will relief and the client feels relaxed and calm.⁹

Benefits Of Guided Imagery:

It is a technique of sense of control which helps the individuals to feel relax and calm, when the situation feel out of control. There are following benefits of guided imagery they are as follows.¹⁰

- Lowers blood pressure.
- Improves shortness of breath.
- Reduce feeling of depression.
- Feeling of wellness.
- Feeling of relaxed mind and body.
- Diverts the attention from pain, stress, worry, anxiety. So that the symptoms can relieve.
- Strengthen the inner body.
- Reduces the nausea and vomiting.

- Improve digestive and breathing problems
- Creating the state you want.

Guided Imagery is Safe Technique?

Yes it is safe technique as per the various research studies. No known risk are identified with guided imagery. If the trainer of guided imagery teaches means it is proved that more effective than self practice.¹⁰

Requirement of Guided Imagery Practitioner:

1. Usually there is no formal licensing process for guided imagery technician. But some schools have training centers which gives guided imagery certificate.

2. Specially card imagery is intended for health profession such as nursing or psychotherapist who are already state issued license.

3. Full training hours required 90 to 200 hours.

4. You can get qualified guided imaginary practitioner through the Academy for guided imagery. The centre will train and give certificate of guided imagery which requires 150 hours of training period.

5. Health professionals, personal coaches, counsellors may adopt his training.¹¹

Criteria of Guided Imagery:

- Select a peaceful environment place and time which you feel convenient.
- Prior starting guided imagery technique tell your family members or surrounding not to disturb at all.
- When you are listening guided imagery audio or music avoid driving.
- Make yourself more comfortable where you are doing guided imagery procedure.
- Switch off mobiles.
- When starting to practice guided imagery the common thing may occur such as running nose, tears, yawning, muscle cramps or twisting.
- If you feel sleepy at the time of practicing relaxation just leave it and choice any day for practice.

● Some unexpected thoughts or feelings may arise as imaginations while practicing guided imagery.

● Try to avoid worry or self decisions of getting it right.

● Day by day if you feel better relaxation, then you will be successful.¹¹

Supportive Studies:

Some of the clinical and research study shows that by practicing guided imagery the following aspects may able to:-

- Helps in healing of stress and depression.
- Helps in increasing the number of immune system cells.
- Helps in rest of mind and the body in relaxed stage.
- Helps in reducing cancer related symptoms like pain, nausea, anxiety etc.
- Helps in feeling of health with well being.

1. A meta-analysis of all the research articles published between 1980 to 2019 on the topic of knowledgeable strategies for pain relieving showed that more than 92% of the studies, cognitive interventions that are guided imagery, hypnosis and progressive relaxation techniques where significantly acts on reducing pain then no treatment. This study suggests that cancer patient facing poor quality of life due to treatment of chemotherapy and radiation. So the studies conducted on cancer patients by using relaxation therapy is to improve quality of life that chance physiological and psychological mechanism that combines together to control pain and related symptoms of cancer.¹²

2. As study was conducted by Lyles et al on cancer patients practicing guided imagery felt less anxiety, distress, nausea and physiological symptoms related to chemotherapy. The study took 50 cancer patients receiving chemotherapy. Method used in this study is guided imagery and progressive muscle relaxation therapy for the session has been started by trainer by individually. Result reviles that patient feels after guided imagery less anxious, controlled nausea, relieved pain

and maintained blood pressure level.¹³

3. A study was conducted by Gruber et al to measure natural killer functions and response of lymphocyte with stage I breast cancer are 18 month period. Samples were trained with guided imagery and asked them to place themselves in relaxed setting. The result shows that significant effects of natural killer cells work with lymphocyte response. There is reducing of psychological symptoms like anxiety takes place and guided imagery become effective technique.¹⁴

Conclusion

Guided imagery is generally potential and safe beneficial technique in providing relief from symptomatic problems in Cancer patients. Guided imagery enhances cancer patients to relief from anxiety, pain, and nausea by using their own sensory imagination of relaxation. Usually in Cancer patients sedating medications will improve quality of life, so guided imagery is one of the best remedy which supports the life for betterment. Guided imagery will not reduce the disease condition but according to some studies shows that the cancer patients control over their lives in facing of crisis. If guided imagery techniques practiced by cancer patients in daily life means there will be positive physical and psychological conditions will improve ultimately intern that will be a good contribution to produce humanistic help in their fatal life in promoting positive directions with better being.

Ethical Clearance: is obtained from the Institution's Ethical Committee of Shri B.V.V.S., Sajjalashree Institute of Nursing Sciences, Navanagar, Bagalkot.

Conflict of Interest: None

Budget: Self.

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Knowledge, Attitude and Practices about the Elderly Care and Elderly Abuse among the Medical and Dental Students

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Abstract

Background: One of the leading causes of mortality in old age is chronic conditions such as heart disease, stroke, cancer, diabetes, Alzheimer's disease so people leave their elderly in hospital alone, this decrease their enthusiasm in healthy living moreover many times as a medical facility, we forget about how to take care and sympathize old age problem. We forget it's not just the disease that is killing them but sense of negligence that making their life hollow.

Aim: To study the knowledge, attitude and practice related to elderly care and their insecurities among MBBS students of 2019 and BDS students 2019 batch

Objective: To assess the level of knowledge about elderly care and problems faced by them.

To assess attitude of students towards the geriatric population.

To assess the practice related to prevention elderly abuse.

Result: Elderly abuse is at a great high in our society with majority of the abuse done by their own children. Highest form of abuse was neglect (45.64%). 59.21% of elderly people didn't receive any help from anyone. Elderly people are considered a huge burden to family for majority of students (76.32%).

Conclusions: it is very important that awareness regarding the elderly care and elderly abuse should be spread at the primary level i.e. in schools, and students must be encouraged to inculcate the knowledge and respect towards the elderly care, and the government should enforce proper laws and penalties for the same.

Keywords: elderly care, elderly abuse, grandparents insecurities

Introduction

Elderly or old age consists of persons who have surpassed or about to surpass the average life span of human beings. Elderly are generally considered as a person who is of age 60 years or above.¹Old age is a part of life after youth and middle age, it could also

define as a process of deterioration in the functional capacity of an individual that results from structural changes, with advancing age. There is no exact age that can be concluded after which old age will start, however different countries and societies consider old age in between mid 40s to 70s. Today the world old age population is 617million which is 8.5 percent of the total world population. By 2020, for the first time in history, the number of people aged 60 years and older will outnumber children younger than 5years. according to new report of "an aging world:2015", this percentage is projected to jump to nearly 17 percent of the world's

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population by 2050 (1.6 billion).²

In INDIA, the old age or senior citizen mean any person being a citizen of India, who has attained the age of sixty and above. According to Population census 2011 there are nearly 104million old age population which account for 16.8 percent of world total old age population; 53 million females and 51 million males. A report released by United Nations Population Fund and Helpage India suggests that number of elderly person is expected to grow to 173 million by 2026.³

Elderly abuse is considered a single or repeated act occurring between any relationship where there should be trust which directly or indirectly causes harm or stress to an old age person. It can be of various types: physical, psychological/emotional, sexual, financial or simply neglect.⁴

Old age comprises a huge number in world population so it is important to look after the health of old people. We are taking this topic due to the rise in negligence of care of old age people. Taking this topic we want to know the knowledge, attitude and perception of medical student towards old age. According to study by Agewell Foundation reveals ugly truth about old age in India. It states that After retirement many elderly people are forced to live a life of humiliation, abuses and isolation.⁷

Going through the various studies we came across a journal about conditions of 400 community dwelling older adults aged 65 and above in Chennai, India. The prevalence rate of mistreatment was 14%. Chronic verbal abuse was the most common followed by financial abuse and the rate of physical abuse and neglect was similar. Among the mistreated, exactly half of them had experienced more than one type of mistreatment (multifaceted-mistreatment).⁵

Negligence not only effect patients medical conditions but it cause severe effect on person psychology and appearance and may lead to Diogenes Syndrome. A study of elderly patients (fourteen men, sixteen women) who were admitted to hospital with acute illness and extreme self-neglect revealed common features which might be called Diogenes syndrome.⁶ Cessation of normal skin cleansing seen in geriatric or self-neglected patients can cause accumulation of keratinous crusts

on the skin. In the extreme end of this spectrum is a condition known as Diogenes syndrome (DS). These patients may have psychiatric disorders like paranoid disorders, mood affection, or temporofrontal dementia.

37% of elderly people are badly treated, 20% has restricted social life, 13% abuse/mentally torture, 13% are denied of basic needs, 9% are physically harassed, and 8% are affected by other form of harassment like emotional blackmailing, snatching their belonging, even saving, useful legal document.⁷

Study of UN suggested that majority of the elderly in India do not get long-term and palliative care.⁸This study help us to know that whether medical student have interest in taking elderly medicine. In country like India (developing country) there is extreme prevalence of communicable disease and non-communicable disease (known as diabetic capital of the world) which cause lack of immunity and increase in morbidity. So it is essential to take care of elderly people because nobody wants that 8.9% of world population is living in morbidity/illness. It is an interventional study. Through a presentation we will try to encourage student of medicine to be concerned about elderly people. To know about the right of old people. To give them knowledge of home care of old age.

Material and Method

Study Setting: Subharti University, Meerut.

Study Population: Students of age group 18-21 years

Study Design: Cross Sectional Study

Sample Size: 400 students (200 students of MBBS and BDS each)

Sampling Technique: Convenient sampling

Inclusion Criteria: Students who were present and willing to participate

Exclusion Criteria: Students who were absent or not willing to participate

Data Analysis: With the use of Microsoft Excel, statistical analysis and representation through graphs

Duration of the study: 2Months

Development of questionnaire: A pre-designed, pre-validated semi structured questionnaire was used. Questionnaire was divided into 3 sections i.e. knowledge, attitude and practice of students regarding elderly abuse

Informed consent: informed consent was obtained from all the individuals participated

Ethical Clearance – Ethical clearance got from institutional ethics committee

Statistical Analysis: The data was entered and analyzed using statistical package SPSS Version 17. Results were tabulated in percentages and proportions.

Result

Elderly abuse is at a great high in our society with majority of the abuse done by their own children. Highest form of abuse was neglect. More than half of elderly people didn't receive any help from anyone. Elderly people are considered a huge burden to family for majority of families. The prevalence of elderly abuse among student is described in table 1. The figure 1 describes the relation of abused with elderly and figure 2 describes the type of elderly abuse. Table 2 describes about elderly care among student whereas figure 3 describes the attitude of students regarding elderly care.

Table-1: HAVE YOU SEEN ANY CASE OF ELDERLY ABUSE?

RESPONSE	NO. OF STUDENTS (%)
YES	63.15
NO	36.85

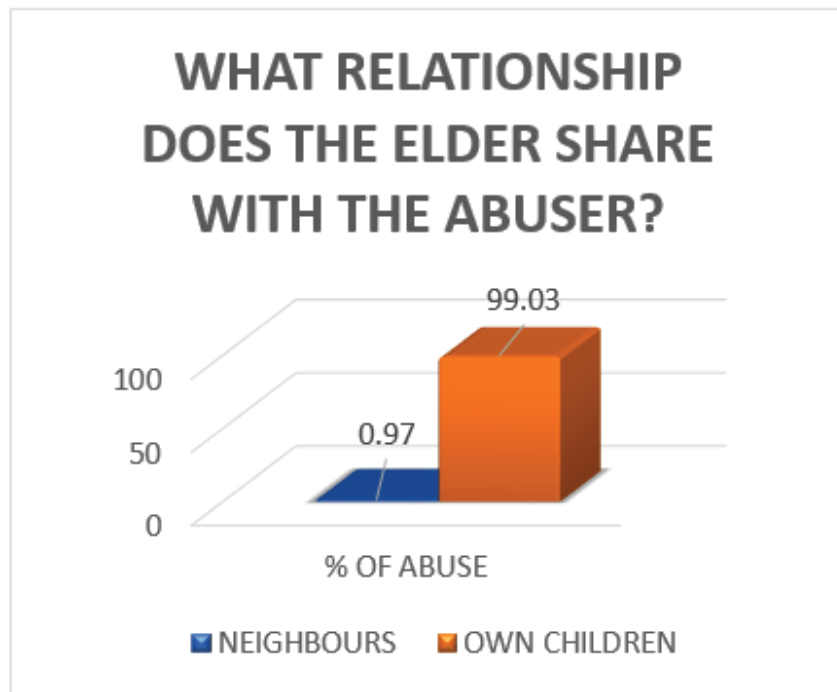


Figure-1: WHAT RELATIONSHIP DOES ELDER SHARE WITH THE ABUSER?

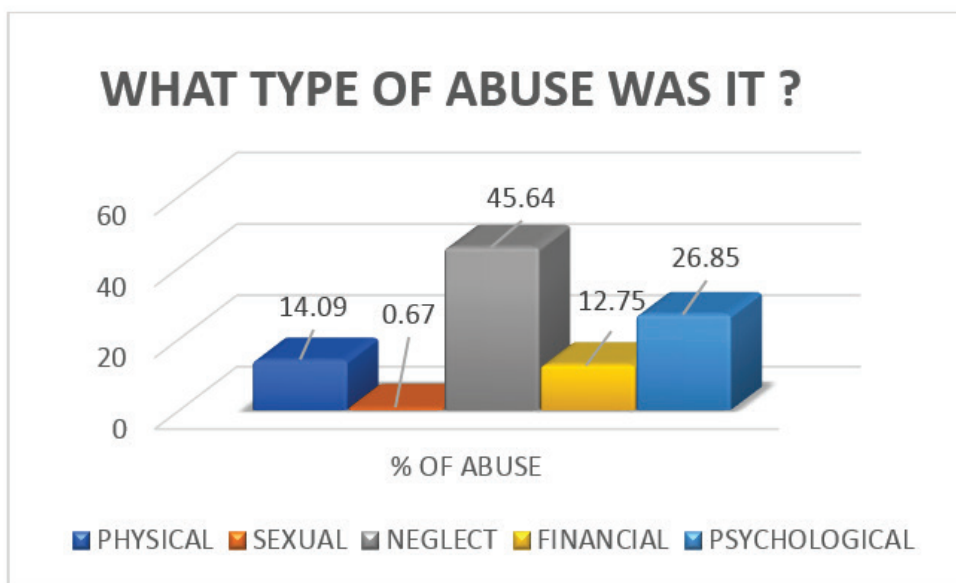


Figure-2: WHAT TYPE OF ABUSE WAS IT?

Table-2: DID THEY RECEIVE ANY HELP FROM OTHERS?

RECEIVED HELP	RESPONSE FROM STUDENTS (%)
YES	40.79
NO	59.21

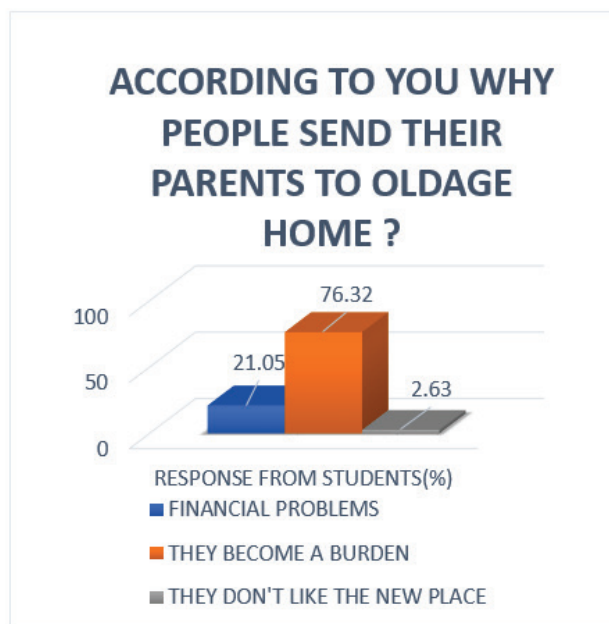


Figure-3: ACCORDING TO YOU WHY PEOPLE SEND THEIR PARENTS TO OLDAGE HOME?

Discussion

The main aim of our study was to assess the awareness of elderly care and elderly abuse in medical students and to see the increasing prevalence of elderly abuse in our society as stated by Agewell foundation is their previous studies. Around 1 in 6 people of 60 years and older experienced some form of abuse in community settings during past few years. Elderly abuse can lead to serious physical injuries and long term psychological consequences. Elderly abuse is an important public health problem and need to deal with. The type of abuse includes physical, sexual, psychological, emotional, and financial and neglect.

Majority of these cases go unreported throughout the year and the prevalence rate is increasing day by day specially in rapidly ageing populations. Though many institutions are working for betterment of elderly it is seen that the rates of abuse are much higher in institutions as compared to community settings.

According to 64 percent of elderly people, loneliness, marginalization and isolation were the most critical issues faced by the bedridden patients as they cannot meet and interact with their relatives and family. Sebastian Det al⁹ noticed that older person who were mistreated in family experienced a range of emotional, psychological distress and physical symptoms. Anger related health issues, demoralization, heat sensation are also related to the neglect it is important to recognize the power of multidimensional challenges caused by elder mistreatment in health and well being.

Juan Manuel Carmona- Torres et al¹⁰ stated that the most common type of abuse noticed was psychological, followed by neglect. But in our study, it was vice-versa i.e. neglect was the most common type of abuse followed by psychological.

It was seen that many people have started living without their parents as a nuclear family so children's have stopped understanding the importance of elders in their life and respecting them. Also it's very hard to believe but majority of the cases of elderly abuse involved their own children and no one else.

We should understand that elderly people should be properly taken care of as they are an important part of the family and it's an inevitable fact that one day everyone has to grow old. Elderly people require special love and care and should not be neglected as such

Conclusion

We got to analyze that among 400 students; 63.5% of all medical students had seen cases of elderly abuse, which is a matter of concern throwing light on the prevalence of this grave issue. Another finding suggested that majority of abuse was from their own children of the respective elderly people. The highest form of abuse was neglect followed by psychological abuse. The main reason for people sending their parents to old age home was that they became a burden and the most dreadful insecurity analyzed by medical students in elderly was emotional

So, in the nutshell, it's the need of the hour that awareness regarding the elderly care should be spread at the primary level i.e. in schools, and students must be encouraged to inculcate the knowledge and respect towards the elderly care, and the government should enforce proper laws and penalties for the same.

Conflict of Interest : None

Source of Funding : Self

Ethical Clearance: The study was approved by institutional ethical committee.

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***Roseomonas Gilardii*, A Pink Non-Fermenter Associated with Bacteremia: A Rare Case**

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Abstract

R. gilardii is a pink gram-negative coccobacillus belonging to the genus *Roseomonas*. Here we are going to discuss about a case which is presented as acute febrile illness. *Roseomonas gilardii* has been isolated from the blood specimen of the patient. She has been treated with Amikacin referring to previous literature¹. The patient started recovering and was discharged in a recovery phase.

Key words: acute febrile illness, blood culture, immunocompromised

Introduction

R. gilardii is a pink gram-negative coccobacillus belonging to the genus *Roseomonas*. These bacteria have been isolated from clinical specimens for the last 30 years, but prior to the current classification, the group had been referred to as Pink Coccoid groups 1 to 4^{1,2,3,4}. In 1993, Rihs divided the genus into six *Roseomonas* species based on biochemical and DNA hybridization techniques⁵. Of these six, *R. gilardii* is most frequently related to human infections. These infections tend to occur in the immunocompromised and are debilitated host. Most patients completely recovered from their infections. Bacteremia is most common presentation⁶. The patient presented with fever typically in immunocompromised host. Other presentation reported as peritonitis, septic arthritis, ventriculitis, catheter based infections⁷.

Case Report

A 42 yr old female presented to the casualty with the

history of fever associated with chills and rigors for the last 28 days. There was occasional vomiting and head reeling. She is known case of type 2 Diabetes Mellitus and Hypothyroidism. She was treated on OPD basis from another physician after which fever did not subside. On examination vitals were stable with temperature recorded as 101 degree Fahrenheit. On systemic examination there was no significant finding. She had been admitted to the hospital with the diagnosis of acute febrile illness to evaluate. In hospital stay during the same day the temperature recorded was 102 degree Fahrenheit during which blood culture was sent and other investigation like CBC, Urine routine and microscopy, Urine culture and sensitivity, Chest x ray PA view, USG Abdomen and Pelvis was done and patient was started on Injectable Ceftriaxone with Oral Azithromycin suspecting in the line of Enteric Fever.

During the next 3 days of Hospitalization the patient was still febrile with maximum temperature recorded is 103 degree Fahrenheit. On investigation CBC there was leukocytosis with white cell count of 12000/cubic mm. Urine routine and microscopy did not reveal any abnormality. No growth was observed on urine culture. Chest x ray was normal with no significant abnormality. Blood culture report was delayed but hospital central laboratory had reported that there was a gram variable organism from culture⁸. On day 5, Lab had given a

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blood culture report which showed the organism to be *Roseomonas gilardii*. The Vitek-2 system could only identify the organism but could not provide the sensitivity pattern. We started the patient on Injectable Amikacin in place of Ceftriaxone on basis of previous literature⁹.

After Amikacin the patient started recovering and has been afebrile for 3 days and the subsequent blood culture was sterile. On day 8 the patient was discharged on request and was asked for frequent check up.

Discussion

The genus *Roseomonas* comprises groups of slow-growing, Gram-negative coccobacilli, which only infrequently cause infection in humans. When identified, they are associated with immunocompromised adults, often causing bacteraemia. Due to their rarity, members of this genus can be overlooked or misidentified using automated laboratory identification systems. *Roseomonas gilardii* is resistant to Cephalosporins. So our patient did not improve during the first 3 days of hospitalisation. The *Roseomonas* is universally susceptible to Imipenem, Amikacin, Gentamycin, Tobramycin⁹. In our cases our patient responded to Amikacin and was discharged during recovery phase.

Conclusion

Roseomonas sp. can cause a variety of clinical diseases including: bacteraemia, soft-tissue infection and bone or joint infection^{7,10,11}. Due to the rarity of this infectious agent, it may be overlooked from a clinical and microbiological perspective. A method to identify organisms collected from sterile sites, such as the Vitek 2 system (bioMérieux), might not correctly identify *Roseomonas* species and needs a careful microbiological correlation like growth after prolonged incubation in an appropriate culture environment and formation of characteristic pink, mucoid colonies. Despite the fact that this infection seems to occur in debilitated patients, mortality from it seems to be relatively low and patients do usually recover completely.

Conflict of Interest: Nil

Source of Funding: Nil

Ethical Clearance: Taken from Institutional Ethical Committee, KIMS, Bhubaneswar.

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Assessment of Malnutrition among Students of Various Districts of West Bengal: A Review

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Abstract

According to World Health Organization (WHO), “Health is a state of complete physical, mental and social wellbeing and not merely an absence of disease”. Energy is required for all physiological processes which are made available through breakdown of complex food materials consumed on daily basis. The nutrition available through food consumption is closely related to the overall health and well being of a person. In the state of West Bengal, poor nutritional status of children, especially in rural areas is becoming a major cause of concern. Not only does it contribute to overall underperformance in schools (including increasing school drop outs), it also predisposes these children towards increasing chances of getting Non-communicable diseases, such as diabetes. Thus this study analysed published reports on nutritional status of children in various districts of the state West Bengal. For this purpose, the study explored the district-wise malnutrition scenario among primary/upper primary students in West Bengal. It was indicated that only less than one-fourth students had appropriate or ideal nutritional status and rest were in various stages of food deprivation which is a matter of great concern.

Keywords: *Nutritional status, school children, poverty, malnutrition, mid-day meal*

Introduction

Primary school children (6-13 years) form about 16% of the total population. Free and compulsory education up to the age of 14 years is the constitutional commitment. It is estimated that about 40% of children drop out at primary school¹. Low enrolment and higher school dropout rate are attributed to poor socio-economic conditions, child labour and lack of motivation compounded by poor nutritional status of the children. Unfortunately many of the Indian children including those of West Bengal suffer from under-nutrition primarily due to low food intake, which could be due to poverty, ignorance etc.^{2,3}. Prolonged under-

nutrition has detrimental effects on all organ-systems and may result into life threatening conditions⁴⁻⁷. This undoubtedly hampers their attendance and performance in their school.

The problem of malnutrition among primary and upper-primary students of West Bengal and its trend (which indicates about effectiveness of the Mid-Day Meal Programme and suggests necessary actions), a cross-sectional school-based epidemiological study was done during the period of April 2014 to March 2015. The study revealed that state-wide prevalence of malnutrition was 26.1% and 19.6% in primary and upper primary students respectively. Another 28.6% and 26.1% of the studied population were ‘At High Risk’ of developing malnutrition (3rd to <10th percentile weight and height in respect to age & sex) among primary and upper-primary students⁸. State-wide Ideal Nutritional status was 17% and 23.5% among primary and upper-primary students^{9,10}. Prevalence of anaemia was 29% and 19% among primary and upper-primary students, respectively¹¹. Religion-wise, Muslims had a

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higher malnutrition than Hindus. Caste-wise, STs had a higher malnutrition than SCs in primary level but SCs had higher malnutrition than STs among upper-primary students^{12,13}. Based on above, it is suggested that districts such as Purulia, Maldah, Murshidabad, Burdwan, Nadia—all may be considered as the most important and primary students of them need to be targeted for improvement of their nutritional status on priority basis. Health and nutrition are the most important contributory factors for human resource development in the country^{14,15}. Dietary requirement of essential nutrients varies with age, gender, physiological status and physical activity¹⁶. Globally, millions of school-going children suffer from under-nutrition¹⁷.

Therefore, nutrition support to primary education is considered as a means to achieve the objective of

providing free and compulsory universal primary education of satisfactory quality to all the children below **Ideal nutritional status** (25th – 75th percentile of Indian Reference Population developed by Indian Academy of Paediatrics) was found to be 17% and 23.5% in primary and upper-primary students¹⁸. Anaemia was prevalent in 29% and 19% in above-said two groups of students respectively. State-wise prevalence of overweight and obesity was 1.7% and 0.8%, and 2.7% and 0.8% among primary and upper-primary students, respectively^{19,20}. Above data indicates that under-nutrition situation improves to some extent among school students as age advances and as students move from primary to upper-primary classes. Exclusive stunting was prevalent in the tunes of 6.9% and 5.7%, and exclusive under-weight was 6.4% and 4.6% in primary and upper-primary students, respectively²¹ as summarised in Tables 1 and 2.

Table-1: Under-weight and stunting in Primary [N=12020] and Upper-Primary Students [N=12091] at age of 14 years

	PRIMARY STUDENTS	UPPER-PRIMARY STUDENTS
Exclusive Stunting	6.9% (n=828)	5.7% (n=685)
Exclusive Under-weight	6.4% (n=775)	4.6% (n=560)
Both stunting & under-weight	12.8% (n=1533)	9.3% (n=1124)

Table-2: Urban-Rural scenario of Malnutrition and Anaemia in Primary and Upper-Primary students at age of 14 years

	PRIMARY STUDENTS		UPPER-PRIMARY STUDENTS	
	Rural (n=8323)	Urban (n=3697)	Rural (n=8272)	Urban (n=3819)
Malnutrition	29.1% (n=2419)	19.4% (n=717)	21.4% (n=1767)	15.8% (n=602)
Anaemia	32.3% (n=667)	21.6% (n=203)	21.3% (n=436)	14.2% (n=137)

District-wise scenario:

It shows district-wise situation of malnutrition and ‘At High Risk’ population among primary students, who are considered as more vulnerable than upper primary students²². From intervention point of view ‘At

High Risk’ population or population with low growth velocity (including low linear growth velocity) must be considered together with Malnutrition group as there is often shifting from ‘At High Risk’ to Malnutrition group, particularly in an under-privileged community²³. This often occurs in situations such as starvation, low food

intake, infection, worm infestation etc.^{24,25}. It is evident that districts namely Purulia (38.4%), Jalpaiguri (37.8%), Darjeeling Plain (35%), Maldah (33.7%), Murshidabad (32%), Burdwan (31.2%) and Coochbehar (30.1%) – all have a malnutrition prevalence rate of more than 30% among primary students. But 'At High Risk' population remains between 27% and 32% in those districts.

Medium prevalent Districts (malnutrition prevalence rate of >20 to 30%) were Bankura (28.7%), Birbhum (28.7%), Uttar Dinajpur (27.2%), Dakshin Dinajpur (26.7%), South 24 Parganas (24%), Midnapore West (21.8%), Hooghly (21.6%), Midnapore-East (20.9%) and Nadia (20.3%), whereas low prevalent Districts (prevalence rate of >10% to 20%) were North 24 Parganas (18.8%), Howrah (18.5%), DGHC (15.5%) and Kolkata (10.5%). At High Risk population distribution varies between 18 and 20.

DISTRICT WISE SENERIO OF MALNUTRITION

BANKURA DISTRICT

MALNUTRITION (UNDER NUTRITION) PROFILE OF PRIMARY STUDENTS

Overall prevalence rate of malnutrition was 28.7% (173/602) among primary students. The same of 'At High risk', 'At Low risk', 'Ideal Nutrition' status and 'Anaemia' was 34.9% (210/602), 24.9% (150/602), 11.5% (69/602) and 34.0% (51/150) respectively. It is also evident that prevalence rate of malnutrition among urban students was 25.7% (53/206) and within it, male had a prevalence rate of 23.6% (25/106) & female had a prevalence rate of 28.0% (38/100). Similarly, prevalence rate of malnutrition among rural students was 30.0% (120/396) and within it, male had a prevalence rate of 30.0% (59/195) and female had a prevalence rate of 30.3% (61/201).

Malnutrition (Under nutrition) Profile of Upper Primary Students

Overall prevalence rate of malnutrition was 19.8% (119/601) among upper primary students. The same of 'At High risk', 'At Low risk', 'Ideal Nutrition' status and 'Anaemia' was 26.0% (156/601), 28.0% (168/601), 26.3% (158/601) and 27.0% (41/152) respectively. It is also evident that prevalence rate of malnutrition among urban students was 16.4% (33/201) and within it, male

had a prevalence rate of 14.2% (23/162) and female had a prevalence rate of 25.6% (10/39).

Similarly, prevalence rate of malnutrition among rural students was 21.5% (86/400) and within it, males had a prevalence rate of 26.6% (37/139) and females had a prevalence rate of 18.8%.

BIRBHUM DISTRICT

MALNUTRITION (UNDER NUTRITION) PROFILE OF PRIMARY STUDENTS

Overall prevalence rate of malnutrition was 28.7% (172/600) among primary students. The same of 'At High risk', 'At Low risk', 'Ideal Nutrition' status and 'Anaemia' was 25.7% (154/600), 28.2% (169/600), 17.5% (105/600) and 37.3% (56/150), respectively. It is also evident that prevalence rate of malnutrition among urban students was 15.8% (31/196) and within it, males had a prevalence rate of 17.2% (20/116) and females had a prevalence rate of 13.8% (11/80). Similarly, prevalence rate of malnutrition among rural students was 34.9% (141/404) and within it, males had a prevalence rate of 44.5% (81/182) and females had a prevalence rate of 27.0% (60/222).

Malnutrition (Under nutrition) Profile of Upper Primary Students

Overall prevalence rate of malnutrition was 24.8% (149/602) among upper primary students. The same of 'At High risk', 'At Low risk', 'Ideal Nutrition' status and 'Anaemia' was 27.7% (167/602), 26.7% (161/602), 20.8% (125/602) and 20.5% (31/151), respectively.

PURULIA DISTRICT

MALNUTRITION (UNDER NUTRITION) PROFILE OF PRIMARY STUDENTS

Overall prevalence rate of malnutrition was 38.4% (231/602) among primary students. The same of 'At High risk', 'At Low risk', 'Ideal Nutrition' status and 'Anaemia' was 29.2% (176/602), 20.6% (124/602), 11.8% (71/602) and 36.2% (54/149), respectively. It is also evident that prevalence rate of malnutrition among urban students was 33.2% (64/193) and within it, males had a prevalence rate of 30.9% (29/94) and females had a prevalence rate of 35.4% (35/99).

Similarly, prevalence rate of malnutrition among rural students was 40.8% (167/409) and within it, males had a prevalence rate of 43.6% (88/202) and females had a prevalence rate of 38.2% (79/207).

Malnutrition (Under nutrition) Profile of Upper Primary Students

Overall prevalence rate of malnutrition was 22.2% (134/604) among upper primary students. The same of 'At High risk', 'At Low risk', 'Ideal Nutrition' status and 'Anaemia' was 24.2% (146/604), 29.3% (177/604), 24.3% (147/604) and 14.6% (22/151) respectively. It is also evident that prevalence rate of malnutrition among urban students was 17.2% (35/203) and within it, males had a prevalence rate of 25.5% (26/102) and females had a prevalence rate of 8.9% (9/101).

Similarly, prevalence rate of malnutrition among rural students was 24.7% (99/401) and within it, males had a prevalence rate of 27.1% (55/203) and females had a prevalence rate of 22.2% (44/198).

NADIA DISTRICT

MALNUTRITION (UNDER NUTRITION) PROFILE OF PRIMARY STUDENTS

Overall prevalence rate of malnutrition was 20.3% (122/600) among primary students. The same of 'At High risk', 'At Low risk', 'Ideal Nutrition' status and 'Anaemia' was 29.3% (176/600), 29.0% (174/600), 21.3% (128/600) and 13.3% (20/150), respectively. It is also evident that prevalence rate of malnutrition among urban students was 11.9% (19/160) and within it, males had a prevalence rate of 11.2% (11/98) and females had a prevalence rate of 12.9% (8/62).

Similarly, prevalence rate of malnutrition among rural students was 23.4% (103/440) and within it, males had a prevalence rate of 29.7% (60/202) and females had a prevalence rate of 18.1% (43/238).

Malnutrition (particularly Under nutrition) Profile of Upper Primary Students –

Overall prevalence rate of malnutrition was 16.7% (100/600) among upper primary students. The same of 'At High risk', 'At Low risk', 'Ideal Nutrition' status and 'Anaemia' was 27.0% (162/600), 29.3% (176/600),

27.0% (162/600) and 17.3% (26/150), respectively. It is also evident that prevalence rate of malnutrition among urban students was 19.4% (33/170) and within it, male had a prevalence rate of 21.0% (22/105) and female had a prevalence rate of 15.5% (23/148). Similarly, prevalence rate of malnutrition among rural students was 15.6% (67/430) and within it, male had a prevalence rate of 15.2% (30/197) and female had a prevalence rate of 15.9% (37/233).

MALDAH DISTRICT

MALNUTRITION (UNDER NUTRITION) PROFILE OF PRIMARY STUDENTS

Overall prevalence rate of malnutrition was 33.7% (202/600) among primary students. The same of 'At High risk', 'At Low risk', 'Ideal Nutrition' status and 'Anaemia' was 27.3% (164/600), 22.7% (136/600), 16.3% (98/600) and 40.7% (61/150), respectively. It is also evident that prevalence rate of malnutrition among urban students was 18.5% (12/65) and within it, males had a prevalence rate of 20.6% (7/34) and females had a prevalence rate of 16.1% (5/31).

Similarly, prevalence rate of malnutrition among rural students was 35.5% (190/535) and within it, males had a prevalence rate of 38.4% (104/271) and females had a prevalence rate of 32.6% (86/264).

Malnutrition (Under nutrition) Profile of Upper Primary Students

Overall prevalence rate of malnutrition was 20.0% (120/600) among upper primary students. The same of 'At High risk', 'At Low risk', 'Ideal Nutrition' status and 'Anaemia' was 27.7% (166/600), 29.3% (176/600), 23.0% (138/600) and 26.7% (40/150), respectively.

MURSHIDABAD DISTRICT

MALNUTRITION (UNDER NUTRITION) PROFILE OF PRIMARY STUDENTS

Overall prevalence rate of malnutrition was 32.0% (192/607) among primary students. The same of 'At High risk', 'At Low risk', 'Ideal Nutrition' status and 'Anaemia' was 30.6% (186/607), 25.7% (156/607), 11.7% (71/607) and 36.0% (54/150), respectively. It is also evident that prevalence rate of malnutrition among

urban students was 28.4% (31/109) and within it, males had a prevalence rate of 27.3% (15/55) and females had a prevalence rate of 29.6% (16/54).

Similarly, prevalence rate of malnutrition among rural students was 32.7% (154/498) and within it, males had a prevalence rate of 32.3% (80/248) and females had a prevalence rate of 33.2% (83/250).

MALNUTRITION (UNDER NUTRITION) PROFILE OF UPPER PRIMARY STUDENTS

Overall prevalence rate of malnutrition was 25.5% (153/600) among upper primary students. The same of 'At High risk', 'At Low risk', 'Ideal Nutrition' status and 'Anaemia' was 30.0% (180/600), 22.2% (133/600), 22.3% (143/600) and 22.0% (33/150) respectively. It is also evident that prevalence rate of malnutrition among urban students was 20.0% (16/80) and within it, males had a prevalence rate of 18.3% (11/60) and females had a prevalence rate of 25.0% (5/20).

Similarly, prevalence rate of malnutrition among rural students was 26.3% (137/520) and within it, males had a prevalence rate of 28.3% (68/240) and females had a prevalence rate of 24.6% (69/280).

Conclusion

The study explored the district-wise malnutrition scenario among primary and upper primary students in West Bengal. It is a matter of great concern that only less than one-fourth students had appropriate or ideal nutritional status and rest were in various stages of food deprivation. Strengthening of existing school meal program is needed, with emphasis on malnourished and high risk children especially in rural areas with lower parental education and poor sanitary practices.

Nutritional surveillance involving above students seems to be beneficial.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Not applicable

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Clinico-social Profile of Dengue Patients Admitted in a Tertiary Care Hospital in Southern Maharashtra, India

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Abstract

Background- Dengue is a positive-strand RNA virus of the Flaviviridae family with 4 distinct serotypes transmitted to humans by several species of the Aedes mosquito. **Objective-** To study the Clinico-social profile of Dengue patients admitted in a tertiary care hospital in Southern Maharashtra, India. **Methodology-** This was a hospital based descriptive observational study undertaken in inpatient wards of Medicine and Paediatrics at the tertiary care hospital from January 2018 to December 2018 where all the confirmed cases of dengue patients were included which were 90. **Result-** Of these 90 cases, (58.70%) were males and (41.30%) were females. High proportion of dengue cases were in 31 to 45 years (42%) followed by cases in the 46 to 60 years (31%). Seasonal variation showed that maximum cases occurred in Post-monsoon (51%) and Monsoon (42%) season and maximum cases (75%) belonged to classical dengue fever while (25%) belonged to Dengue haemorrhagic fever. The most common symptoms were headache (74%), abdominal pain (61%), vomiting (55%), arthralgia/myalgia (48%), retro-orbital pain (47%) and hepatomegaly (38%). **Conclusion-** There should be community involvement in prevention of Dengue by the use of personnel protective measures or source reduction by emptying the man made containers etc. for eliminating vector-breeding sites especially during the monsoon season.

Keywords- Clinico-social profile; Dengue; Tertiary care hospital.

Introduction

Dengue viruses are arboviruses capable of infecting humans, and causing disease. Dengue fever is a self-limiting disease and represents the majority of cases of dengue infection. Dengue fever (DF) and its severe forms - dengue haemorrhagic fever (DHF) and dengue shock syndrome (DSS) - have become major international public health concerns¹. The global epidemiology of dengue fever/dengue hemorrhagic fever (DF/DHF)

is changing fast². Worldwide, annually about 500,000 people with DHF require hospitalization. Approximately 90 per cent of them are children aged less than five years, and about 2.5 per cent of those affected die. Dengue is endemic in 35 states/UTs. During 2017, about 157,996 cases were reported with 253 deaths. The case fatality rate was 0.16 per cent¹.

Dengue virus is a positive-strand RNA virus of the Flaviviridae family with 4 distinct serotypes (DV1-4), and is transmitted to humans by several species of the Aedes mosquito³. The presence of muscle and joint pains gives an alternative name to the dengue fever as 'break bone fever'⁴. Subsequent infection with different serotypes increases the severity of this fatal infection⁵.

In this study we have studied the clinico-social profiles of the confirmed dengue cases reported to tertiary care hospital.

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Aim and objective- To study the Clinico-social profile of dengue patients admitted in a tertiary care hospital in Southern Maharashtra, India.

Material and Methods

This was a hospital based descriptive observational study undertaken in inpatient wards of the department of Medicine and Peadiatrics at the tertiary care hospital. The study period was from January 2018 to December 2018 i.e. total period of one year.

Study Sample :

In our study, all the confirmed cases of dengue patients admitted in the inpatient wards of the department of Medicine and Peadiatrics of the tertiary care hospital were included which were 90.

Data collection: After explaining the purpose of study and obtaining verbal informed consent from

the patients, all patients were interviewed with the help of preformed structured questionnaire and clinical examination was done. Patients were classified as dengue fever, dengue hemorrhagic fever I-IV or dengue shock syndrome according to WHO guidelines⁶.

Records of all patients were studied and data regarding their clinicosocial profile was analyzed. Data was entered in Microsoft excel sheet and it was analyzed with Epi info software. Statistical analysis was done by using simple proportions and percentages. Throughout the study anonymity of all patients was maintained and privacy as well as confidentiality of the data was assured.

Results

The present hospital based observational descriptive study was carried out among 90 confirmed cases of dengue who were admitted in the inpatient wards of the Department of Medicine and peadiatrics during the study period.

Table 1: Sex and Age wise distribution of cases

Age (in years)	Male	Female	Total	Percentage %
0-15	06	05	11	13
16-30	05	03	08	09
31-45	21	17	38	42
46-60	17	11	28	31
≥ 61	03	02	05	05
Total	52	38	90	100

Table 1 shows Sex and Age wise distribution of cases. Out of total 90 cases, (58.70%) were males and (41.30%) were females. The proportion of male cases was higher than females. High proportion of dengue cases were in 31 to 45 years (42%) followed by cases in the 46 to 60 years (31%).

Table No. 2: Distribution of study subjects according to demographic characteristics-

Religion	Number (n=90)	Percentage
Hindu	38	42
Muslim	30	33
Buddha	20	23
Christian	02	02
Socioeconomic class		
Class II	10	11
Class III	26	29
Class IV	37	41
Class V	17	19
Occupation		
Professional	01	1.11
Managerial	02	2.22
Clerical and skilled	05	5.55
Semiskilled	36	40
Unskilled	26	28.88
Unemployed	20	22.24
Type of family		
Nuclear	21	23
Joint	28	32
Three generation	41	45
Education		
Illiterate	13	15
Primary education	07	07.72
Secondary education	18	20.08
SSC	28	31
HSC	11	12
Graduate	12	13.09
Post graduate	01	1.11

Table 2 shows distribution of cases according to demographic data. Religion wise distribution shows that maximum number of individuals were Hindu by religion i.e. 42%. Muslim individuals were 33%, Buddhist individuals were 23% and Christian were 2%.

Distribution of cases according to socioeconomic status shows that the maximum numbers of study subjects were from socioeconomic class IV i.e. 41% and minimum numbers of study subjects were from socioeconomic class II i.e. 11%.

Distribution of study subjects according to occupation shows that maximum individuals are having semi-skilled occupation i.e. 40% and minimum individuals were having professional occupation i.e. 1.11%. Among 90 study subjects, 22.24% were unemployed individuals and 28.88% were unskilled individuals.

Distribution of study subjects according to type of family shows that maximum numbers of individuals were from three generation family i.e. 45% followed by joint family 32% and nuclear family 23%.

Distribution of study subjects according to education shows that most of the Dengue patients were educated up to SSC i.e. 31 % followed by patients with secondary education up to i.e. 20.08% while 15% were illiterate.

Table 3: Distribution of cases according to seasonal variation of Dengue.

Season	Number	Percentage %
Winter (December-February)	04	05
Summer/Pre-monsoon(March-May)	02	02.22
Monsoon (June-September)	38	42
Post-monsoon(October-November)	46	51
Total	90	100

Distribution of cases according to seasonal variation of Dengue in table 3 shows that maximum cases occurred in Post-monsoon (51%) and Monsoon (42%) season compared to the Winter (5%) and Summer (2.2%) season.

Table 4: Distribution of cases according to Classification of Dengue.

Classification of Dengue	No.	Percentage %
Dengue Fever[DF]	67	75
Dengue Haemorrhagic Fever[DHF] I	10	11
Dengue Haemorrhagic Fever[DHF] II	08	09
Dengue Haemorrhagic Fever[DHF] III	3	03
Dengue Haemorrhagic Fever[DHF] IV	2	02
Total	90	100

Table 4 shows Distribution of cases according to WHO Classification of Dengue where Dengue Haemorrhagic Fever(DHF)III and IV were considered as Dengue shock syndrome. It shows maximum number of cases (75%) belonged to classical dengue fever while (25%) belonged to Dengue haemorrhagic fever.

Table 5: Distribution of cases according to symptoms of Dengue.

Symptoms of Dengue	No.	Percentage %
Headache	67	74
Abdominal pain	55	61
Vomitting	50	55
Arthralgia/ Myalgia	43	48
Retro- orbital pain	42	47
Rash	21	24
Hepatomegaly	35	38
Cutaneous hypersensitivity	13	14
Haemorrhagic manifestations	14	15
Signs of plasma leakage	27	30
Signs of circulatory failure	04	05
Signs of shock	02	02.22

Table 5 shows that the most common symptoms of Dengue were headache (74%), abdominal pain (61%), vomiting (55%), arthralgia/myalgia(48%), retro-orbital pain(47%) and hepatomegaly(38%). Whereas some cases had signs of plasma leakage (30%), rash(24%), and cutaneous hypersensitivity (14%). Haemorrhagic manifestations were present in (15%) cases in which epistaxis was the most common symptom. While (5%) had signs of circulator failure and (2.22%) suffered from profound shock.

Discussion

In the present study ,a total of 90 confirmed dengue cases were reported at the hospital during the study

period from January 2018 to December 2018. Of these 90 cases, (58.70%) were males and (41.30%) were females as seen in study done by Atul Garg et al³.

Another study done by Kumar et al ⁷also showed higher prevalence of dengue infection among males than females. The male-to-female ratio was 2:1. The age group of 31-45 years was highly affected with dengue in our study and these finding are consistent with other Indian studies like Gupta et al ⁸ and Kumar et al ⁷who have reported 15 to 45 years as the most affected age group.

Contrary to this, in a study done by Shah et al⁹, it was seen that children are the most frequent victim of

dengue.

Distribution of study subjects in table no.2 shows that maximum number of individuals were Hindu by religion i.e. 42% belonging to socioeconomic class IV i.e. 41%, 15% were illiterate and among 90 study subjects, 22.24% were unemployed individuals and 28.88% were unskilled individuals belonging to three generation family i.e. 45%.

Distribution of cases according to seasonal variation of Dengue in table 3 shows that maximum cases occurred in Post-monsoon (51%) and Monsoon (42%) season compared to the Winter (5%) and Summer (2.2%) season. The correlation between occurrence of dengue and monsoon season is also evident in a study done by Atul Garg et al³ in which seasonal trend showed that there were no positive cases from January to July every year; the infection started spreading in August, peaked in October and slowly tapered by December. Study done by Ekta Gupta et al also gave similar findings showing increased dengue virus activity in post monsoon period September to November with peak in the second and third week of October⁸.

Table 4 shows Distribution of cases according to WHO Classification of Dengue where Dengue Haemorrhagic Fever(DHF) III and IV were considered as Dengue shock syndrome. It shows maximum number of cases (75%) belonged to classical dengue fever while (25%) belonged to Dengue haemorrhagic fever. The study findings are parallel to a study done by Jimmy Antony et al⁵ in which out of 341 cases, 333 (97.65%) were due to classical dengue fever and remaining 8 cases (2.34%) were due to dengue hemorrhagic fever.

Table 5 shows that the most common symptoms of Dengue were headache (74%), abdominal pain (61%), vomiting (55%), arthralgia/myalgia(48%), retro-orbital pain(47%) and hepatomegaly(38%). Whereas some cases had signs of plasma leakage (30%), rash(24%), and cutaneous hypersensitivity (14%). Haemorrhagic manifestations were present in (15%) cases in which epistaxis was the most common symptom. While (5%) had signs of circulator failure and (2.22%) suffered from profound shock. The study findings are similar to a study done by Ritu Karoli et al¹⁰ in which most common symptoms were headache (105, 76%), abdominal pain (87, 63%), vomiting (80,

58%), rash (36, 26%), and cutaneous hypersensitivity (22, 16%) and Haemorrhagic manifestations in 55(40%) of the cases.

Limitations of the study-

As it was a hospital based study, the study findings can not be generalised to the whole population.

Conclusion

Poverty, illiteracy and ignorance about mosquito borne diseases are the main hurdles of prevention of dengue. As there is no proper vaccine, the main preventive measure is through integrated vector management. There should be community involvement in prevention of Dengue by the use of personnel protective measures or source reduction by emptying the man made containers etc for eliminating vector-breeding sites especially during the monsoon season. Whereas early diagnosis and timely treatment of Dengue cases plays a vital role in secondary prevention.

Ethical approval: The study was approved by the Institutional Ethics Committee.

Funding- There are no sources of funding for this study.

Conflict of Interest - All authors declare that there are no conflicts of interest in this study.

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Diabetes Mellitus and Associated Factors among the Elderly Living in the Old Age Homes of Davangere District: A Cross Sectional Study

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Abstract

Introduction: Old age comes with lot of ailments & diseases. Diabetes and its Complications can cause economic & social burden to the elderly living in the old age homes. Caregivers in the old age homes have the responsibility to take care the health problems of the elderly. If diabetes is undetected or uncontrolled for many years, elderly can suffer from serious health problems

Objectives: 1.To assess the magnitude of diabetes mellitus among the elderly living in the old age homes 2. To determine the factors associated with diabetes Mellitus.

Methods: A Cross sectional study was conducted for a period of 6 months in the 7 old age homes (OAH) of Davangere district. Elderly aged 60 years and above residing in the old age homes were the study participants. A total of 105 elderly were subjected to Fasting blood sugar (FBS) estimation using glucometer. Elderly having FBS value above 126 mg/dl & if the elderly was taking treatment for diabetes then they were considered to be diabetic

Results: Magnitude of diabetes mellitus among the elderly living in the old age homes was 15.2%. Majority were in the age group of 60 – 69 years accounting for 22% followed by 70 – 79 years age group 14% & none of the elderly in the age group of 80 – 89 years were having diabetes. Diabetes was more among females (18%) than males (11%). There was no statistically significant association between any of the socio-demographic factors & diabetes mellitus.

Conclusion: Magnitude of the diabetes mellitus decreased with the increasing age. Females were having higher proportion of diabetes than males. Emphasis needs to be given in addressing the health problems like diabetes among the elderly living in the institutions like old age homes, so that they can have a better quality of life.

Keywords: Diabetes, Elderly, old age homes, Fasting blood sugar

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Introduction

Diabetes in the elderly people is emerging as one of the most important public health problems of the 21st century. Type 2 diabetes mellitus is a classic example of a disease that increases with age. Both diabetes and aging increase the risk for arteriosclerosis and cardiovascular mortality. [1] Due to better health care system and good

medicines there is reduction in the mortality which is resulting in increasing number of elderly persons in the population.^[2] According to population census 2011, there are nearly 10.4 crore elderly in India ^[3] and it will be 17.7 crore by 2020. ^[4] Elderly population contributed to 7% of total population of India in 2001 and proportion has increased to 8.6% in 2011, by 2016 it will rise to 9%. ^[4] India has thus acquired the label of an “Ageing Nation”.

For generations, India had a prevailing tradition of the joint Family. However with urbanization and economic development, India has witnessed a breakup of the traditional joint family into more nuclear families, ^[5] and elderly are facing problems like economic insecurity, loneliness, lack of emotional support, dependency and lack of protection for their lives and property. ^[6] As a result of this, in the recent times the necessity of traditional role of the family is being provided by institutions such as old age homes. ^[7]

Old age comes with lot of ailments & diseases. ^[8] With the age, NCDs become leading cause of morbidity, disability & mortality in all regions of the world, including developing countries. ^[8] In India 20% of the elderly population has diabetes mellitus, majority of them have type 2 diabetes. ^[9] This condition cannot be reversed, only be managed for the rest of person’s life. If diabetes is undetected or uncontrolled for many years, it can lead to serious health complications which include nephropathy, retinopathy & neuropathy. ^[10] Complications can cause economic & social burden to the elderly with diabetes ^[11] The older generation that had once been dependent on their children for the old age care is now increasingly looking towards old age homes. ^[12] Caregivers in the old age homes has the responsibility to take care the health problems of the elderly. In this regard present study attempts to contribute in the care of the elderly with the following objectives

Objectives

1. To determine the magnitude of diabetes mellitus among the elderly living in the old age homes
2. To determine the factors associated with diabetes Mellitus.

Materials and Method

A Cross sectional study was conducted for a period of 6 months in the 7 old age homes (OAH) of Davangere district. Elderly aged 60 years and above residing in the old age homes were the study participants. Complete enumeration of all the elderly living in the 7 OAHs in Davangere district was done. With this by the end of study period the authors were able to reach a sample of 105 elderly. Individuals residing in OAHs but aged below 60 years and individuals who refused to give consent were excluded from the study. Data was entered in excel and analysed using statistical package SPSS. Results were tabulated in percentages and proportions. Chi square test was applied to test the significance of factors associated with diabetes.

Methodology

A pre tested and semi structured questionnaire was used to interview the elderly after modifying to local language. Contents of the questionnaire were explained to the elderly and to the head/manager (concerned person) of the old age home. They were ensured that a total confidentiality will be maintained. Obesity was assessed by calculating Body Mass Index (BMI). The BMI cut off values for Asian Indians as recommended by the World Health Organization (WHO) was used in the present study. A desirable BMI according to the WHO recommended cut-offs for Asians is considered to be between 18.5 and 22.9 kg/m². A BMI of 23–24.9 kg/m² is defined as ‘overweight’ and ≥ 25 kg/m² as ‘obese’.^[13] Fasting blood sugar estimation was done using glucometer with an early morning blood sample after a fast of at least 8 hours. The report from WHO/IDF (International Diabetes Federation) consultation has recommended that, venous plasma glucose should be the standard method for measuring and reporting glucose concentrations in blood. However in recognition of the widespread use of capillary sampling, especially in under-resourced countries, conversion values for capillary plasma glucose are provided for post-load glucose values. Fasting values for venous and capillary plasma glucose are identical. ^[14] According to ADA, the criteria for the diagnosis of diabetes mellitus emphasize that the HbA1C or the Fasting plasma glucose as the most reliable and convenient tests for identifying diabetes mellitus in asymptomatic individuals. Elderly having

FBS value above 126 mg/dl and if the elderly was taking treatment for diabetes then they were considered to be diabetic^[15]

96% residents belonged to Hindu religion & regarding educational status 46% were illiterates & 29% stopped education during primary schooling.

Results

Out of 105 residents, majority were in the age group of 60 – 69 (young old) accounting for 48% and 34% were in the age group of 70 – 79 years. Females outnumbered the males accounting for 65%. Regarding marital status 61% were either widow or widower and 13% remained unmarried. With respect to religion

Major portion of the elderly were engaged in unskilled work in their past as their mode of earning (38%). Social security in the form of old age pension/ widow pension was available to 43% of the elderly. Majority of the elderly were from rural area accounting for 71%. Regarding duration of stay in the Old age home, 32% of the elderly were living since less than 1 year and 33% were living since 1 to 3 years.

Table1: Association between socio – demographic factors and the fasting blood sugar levels

Parameter	Categorisation	Fasting Blood Glucose Levels		Total	P value
		Normal(n =89) Frequency (%)	Diabetes Mellitus (n=16) Frequency (%)		
Age (in years)	60 - 69	39 (78)	11(22)	50	0.73
	70 - 79	31 (86)	5(14)	36	
	80 & above	19 (100)	0 (0)	19	
Gender	Male	33 (89)	4 (11)	37	0.41
	Female	56 (82)	12 (18)	68	
Educational Status	Not Literate	39 (81)	9 (19)	48	0.36
	Literate	50 (88)	7 (12)	57	
Place	Urban	24 (80)	6 (20)	30	0.39
	Rural	65 (87)	10 (13)	75	
Duration of Stay	< 4 years	58 (85)	10 (15)	68	0.83
	>4 years	31 (84)	6 (16)	37	

*To be read row wise

Magnitude of diabetes mellitus among the 105 elderly living in the old age homes was 16 (15.2%). Among the diabetics, new detected diabetics accounted for 6 (5.7%). Distribution of elderly with respect to age & diabetes mellitus, majority were in the age group of 60 – 69 years accounting for 22% followed by 70 – 79 years age group (14%) and none of the elderly in the age group of 80 – 89 years were having diabetes. Diabetes was more among females (18%) than males (11%). Illiterates (19%) accounted for greater proportion of diabetics than literates (12%). With respect to their place of residence before joining old age home, diabetes was more among urban elderly (20%) than rural elderly (13%). Regarding duration of stay, there was almost similar magnitude of diabetes between elderly staying since less than 4 years (15%) & those staying since more than 4 years (16%). There was no statistically significant association between any of the socio- demographic factors & diabetes mellitus

Table 2: Association between Body mass index (BMI) and the Fasting blood sugar (FBS) levels

Parameter	Categorisation	Fasting Blood Glucose Levels		Total	P value
		Normal (n = 89) Frequency (%)	Diabetes Mellitus (n = 16) Frequency (%)		
Body Mass Index (BMI)	Normal	58 (83)	12 (17)	70	0.57
	Overweight/Obese	31 (89))	4 (11)	35	
Total		89	16	105	

***To be read row wise**

Diabetes was more among the elderly whose BMI values were within normal limits (17%) than the elderly who were overweight or obese (11%) & there was no statistically significant association between BMI and diabetes mellitus

Discussion

The increasing number of older persons put a strain on health care & social care systems in the country. [2] The Prevalence of diabetes among the elderly population in urban areas of India for last ten years is reported as ranging from 3.3% to 36.0%. The average prevalence of diabetes among the elderly population in urban areas of India for last ten years is 16.41%. In the present study the magnitude of diabetes mellitus is 15.2%, similar results were found in a study by Singh JP conducted in urban slum of Nagpur (2011) [11] where the prevalence of diabetes was 17.75% & in a study by Singh AK et al. in an urban slum of Delhi (2012) [16] the prevalence of diabetes in elderly persons was found to be 18.8%. In the

present study new diabetics accounted for 5.7% and in the study by Singh JP [11] new diabetics were 4%. In the present study diabetes was more among females (18%) than males (11%), similar result was found in a study by Singh AK et al. (2012)[16] where it was 21.8 and 15.9% among women and men respectively whereas another study by Sharifi F et al. (2010)[17] in Iran reported, the prevalence of diabetes mellitus was 21% in men and 16% in women. The difference in the geographical area, cultural and social factors between the two countries might be responsible for the higher prevalence in males.

In the present study majority of diabetics were in the age group of 60 – 69 years accounting for 22% followed by 70 – 79 years age group (14%) and none of the elderly in the age group of 80 – 89 years were having diabetes, the magnitude of diabetes decreased with increasing age. Similarly in a study by Singh AK et al. (2012)[16] the prevalence of diabetes decreased with increasing age where 20.3% diabetic were in the age group of 60 – 64 years, 18.9% were in 65 – 69 years age group & 14.4%

were 70 years & above. The reason for the decreasing prevalence of diabetes with increasing age can be due to reduction in the life expectancy of the diabetic patients.

Conclusion

Magnitude of the diabetes mellitus decreased with the increasing age of the elderly. Females were having higher proportion of diabetes than males. Proportion of diabetes was more among elderly coming to old age home from urban areas. More studies should be conducted in the old age homes, elderly living there are often neglected from the families. Emphasis needs to be given to the health problems like diabetes mellitus among the elderly living in the institutions like old age homes, so that they can have a better quality of life. There was no statistically significant association between any of the socio- demographic factors & diabetes mellitus.

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Delays Affecting Outcome of Tuberculosis Patients: A Quantitative Survey in a Backward District of West Bengal, India

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Abstract

Background: Delay in diagnosis and treatment of TB patients increases infectivity of disease in community, more complications and higher risk of death. **Objectives:** To assess magnitude of different types of delay in diagnosis and treatment of TB and to find out its association with treatment outcome. **Methods:** A descriptive cross-sectional study was conducted in Lokepur Tuberculosis Unit of Bankura, West Bengal from July 2016 to June 2017. Simple random sampling was adopted to select 50% of the DOTS centers under that Tuberculosis Unit. Complete enumeration of adult TB patients receiving Cat I treatment and registered from June to October 2016 was done from selected DOTS centers. Exit interview of the patients was conducted using pretested predesigned questionnaire and treatment outcomes were recorded from TB register. Data were entered in MS Excel spread sheet and analysed by SPSS 22.0 version. **Results:** Mean TB patient delay, diagnostic delay and treatment delay were 19.53 days, 18.54 days, 5.17 days respectively. All types of delay were significantly associated with unfavourable treatment outcome. **Conclusion:** Increasing knowledge of first care giving person, monitoring and supportive supervision at all level of healthcare delivery are the steps needed at this hour.

Key words: TB patient delay, health system delay, Treatment outcome, DOTS

Introduction

Tuberculosis (TB) is one of the top 10 causes of death and the leading cause from a single infectious agent. It is a major public health problem, particularly in the low- and middle-income countries.¹ India ranked first among the high burden countries, despite achieving the targets of case finding rate 70% and treatment completion rate of over 85%.²

Delays in diagnosis and treatment of TB cases are major impending factors in the control of TB.³ In

2016 there were 89,814 cases registered under Revised National Tuberculosis Control Program in West Bengal.⁴ In spite of administering DOTS at a time and place convenient to the patient, 4162 cases were registered in 2016 in Bankura district of West Bengal.⁴

Early diagnosis of the disease and prompt initiation of treatment are essential for an effective TB control program.⁵ Like any other illness, private and informal Health Care Providers (HCPs) are often the first care seeking person and these patients moves from one HCP to another before they are finally diagnosed and started on anti TB treatment.⁶ Delay in diagnosis may worsen the disease, increases risk of death and enhances tuberculosis transmission in the community.⁷ A single infectious person who remains untreated can infect 10-15 people every year, spreading the infection in the community.^{1,8}

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After extensive literature search, delay of diagnosis and treatment of TB had been found yet to be explored in Bankura district of West Bengal. Bankura district is economically under developed and is one of the backward districts of West Bengal. With this back drop the present study had been conducted in a tuberculosis unit (TU) of Bankura to assess the magnitude of different types of delay in diagnosis and treatment of TB and to find out its association with treatment outcome.

Methods

A descriptive, cross-sectional study was carried out in 2016-17 at Lokepur TU which is located within the campus of Bankura Sammilani Medical College. It was covering 3.5 lakh population⁹ and controlling 44 DOTS centres. All the adult (≥ 15 years) Tuberculosis patients registered in Lokepur TU of Bankura and receiving Cat I treatment constituted the study population. Among the 44 DOTS centers, 50% were selected by simple random sampling (SRS). Then complete enumeration of all the adult TB patients receiving Cat I treatment in intensive phase and registered under Lokepur TU from June to October 2016 was done from the selected DOTS centers.

One study conducted in East Sikkim; the prevalence of total diagnostic delay₂ was 58.2%.¹⁰ After applying the formula $n = (Z p q) / l$ we got $n = 94$ [Where $Z = 1.96$, $p = 0.58$, $q = 1 - p = 0.42$, $l =$ absolute precision, that was assumed 10%], considering 10% nonresponse rate $n = 94 + 9.4 \approx 104$. According to inclusion criteria, number of patients receiving Category I treatment from 22 DOTS centers and registered from June to October, 2016 under Lokepur TU was 115 (which became the final sample size).

Study tool was pre-designed, pre-tested interviewer administered questionnaire containing both open and close ended questions. Language validation was done by language experts and content validation was done by faculty members of Community Medicine Department, BSMC.

Pretesting was done on 20 adult patients receiving Cat I treatment under Amarkan TU fulfilling the same criteria of sample population. Ethical clearance was taken from the Institutional Ethics Committee of Bankura Sammilani Medical College. Chief Medical Officer of Health, Bankura and District Tuberculosis

Officer were informed regarding the study. Before starting the interview, verbal informed consent was taken from all participants.

The data were collected by exit interview of the patients and by review of records. Interviews were conducted on DOTS days from July, 2016 to November, 2016. All the patients had their treatment outcome by May, 2017 and these outcomes were obtained from TB register of Lokepur TU.

Data were entered into Micro Soft (MS) excel spreadsheet. Analysis was done in statistical software SPSS 22.0 version. Mean, Standard deviation and proportion were calculated for descriptive statistics. Relationship between the different types of delay and treatment outcome was calculated by bivariate analysis like- Chi square tests (two tailed). In these statistical tests p value ≤ 0.05 with 95% confidence interval was considered significant. Binary Logistic Regression was done to find out the inter-relationship of different variables as well as to assess the determinants of treatment outcome while adjusting all the possible confounders.

Selected definitions

1st delay - TB patient delay, 2nd delay - TB diagnostic delay, 3rd delay - TB treatment delay¹¹

Operational definition

TB patient delay - if the duration was > 14 days

TB diagnostic delay - if the duration was > 7 days

TB treatment delay - if the duration was > 7 days

Family Size: Large - ≥ 5 family members, Small- < 5 family members

Results

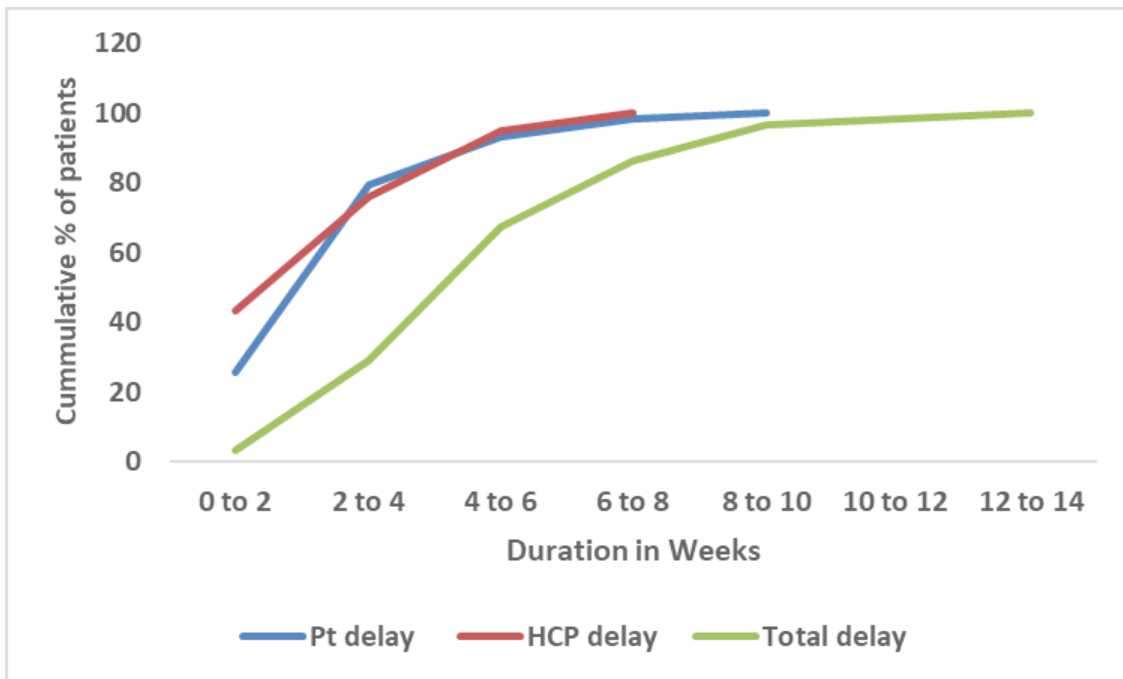
Almost 90% patients belonged to productive age group (15-59 years). Proportion of male was more than female patients. About 62% patients belonged to SC, ST and OBC. Almost half of the patients were illiterate and labourer by occupation. Nearly 46% of the patients belonged to large family. Most of the patients (93%) belonged to lower socio-economic status according to updated and modified B G Prasad Scale 2016. History of substance abuse was there in nearly 75% patients.

The average time interval from appearance of symptoms to seeking care first time was 19.53±10.64 (mean ± SD) days, average time interval from care seeking first time to confirmation of final diagnosis was 18.54±12.08 (mean ± SD) days and average time interval from confirmation of diagnosis to initiation of treatment was 5.17±3.73 (mean ± SD) days.

Almost half of the patients (49.6%) went to health care providers other than the government for their initial symptoms. Those were private healthcare providers (26.1%), traditional healers (12.2%) and medicine shop personnel (11.3%). Almost 36% patients had delay in seeking care first time from any source after the appearance of symptom. Majority of the patients (68.4%) thought it was a simple cough and cold and delayed in seeking care first time. TB patient delay was more among the females (48%) than the males (26.2%) and the difference was statistically significant (χ^2 value 5.87 at df 1, p value 0.015).

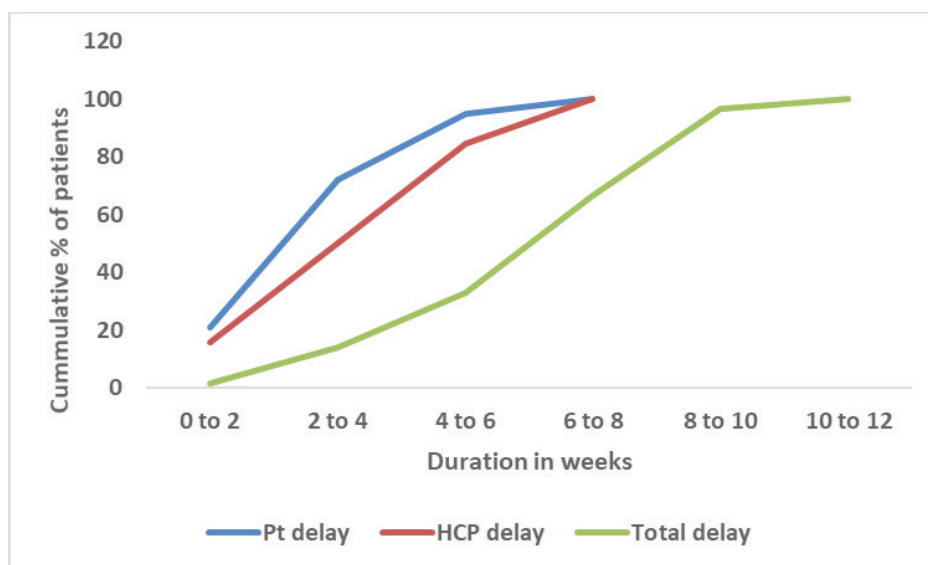
Majority of the patients (70%) had diagnostic delay. Mostly this delay was for getting confirmed report of biopsy in case of extra-pulmonary TB. Most of the patients (88.7%) received confirmed final diagnosis at Government health facility. Almost half of the patients (49.6%) had TB treatment delay. Majority of the patients (91.3%) received first treatment from the same place of present treatment. Lack of money was the main cause for transferring patients from another place to present center for getting ATD.

Association with first care seeking person were further analyzed by comparing the distribution of delay periods (Fig. 1a & 1b). About 33% patients who initially visited public health care providers had been detected started treatment within 4 weeks compared to 14% who initially visited others (p value 0.027). In case of health care provider delay (HCP), 43% who initially visited public sector had no delay compared to 16% who initially visited others (p value 0.002). However, regarding patient delay there was no significant difference between the two groups.



Pt- patient, HCP- Health Care Provider

Fig 1a: Cumulative proportion of patient, health care provider & total delay among new Tuberculosis patients who initially visited public health care providers



Pt- patient, HCP- Health Care Provider

Fig 1b: Cumulative proportion of patient, health care provider & total delay among new Tuberculosis patients who initially visited Others (private practitioners, traditional healers, medicine shop personnel)

In Lokepur TU, Cure rate was 53.1% and treatment completion rate was 33.9%. So, treatment success rate of Cat I TB patients was almost 87%. On the other hand, 7.8% were lost to follow up, 3.4% was not evaluated and death rate was 1.8%.

Treatment success rate was more among the patients who did not have patient delay also who did not have diagnostic delay and treatment delay (Table 1). It was revealed in binary logistic regression that treatment success was statistically associated with education and TB treatment delay while adjusting the effect of other variables. Literate patients had higher rate of treatment success; one-unit increase of literacy status would increase treatment success by 2.24 units. When there was no treatment delay success rate was higher, one unit decrease of treatment delay would increase treatment success by 2.07 units (Table 2).

Table 1: Distribution of patients according to different types of delay in TB and treatment outcome (n=115)

Different types of delay in TB		Treatment outcome		Total	Statistics	p value, df
		Success	Others*			
		No. (%)	No. (%)	No. (%)		
TB patient delay	Present	32(78)	9(22)	41(100)	Chi square test	0.035,1
	Absent	68((91.9)	6 (8.1)	74(100)		
TB diagnostic delay	Present	66(82.5)	14(17.5)	80(100)	Fisher's exact test	0.036,1
	Absent	34(97.1)	1(2.9)	35(100)		
TB treatment delay	Present	46(80.7)	11(19.3)	57(100)	Chi square test	0.048,1
	Absent	54(93.1)	4 (6.9)	58(100)		

*Includes lost to follow up, not evaluated & death

Table 2: Logistic regression showing association between the factors affecting treatment outcome (n=115)

Variables	Category	Sample size	% of Treatment success	β	Sig.	AOR	95% CI for AOR	
							Lower	Upper
Age	≤50 years	88	90.9	1.49	0.06	4.43	0.90	21.70
	>50 years	27	74.1			1	*	*
Gender	Male	65	81.5	1.19	0.15	1	*	*
	Female	50	94			3.31	0.63	17.34
Education	Illiterate	68	80.9	2.24	0.02	1	*	*
	Literate	47	95.7			9.39	1.42	62.13
Family size	Large	53	79.2	1.45	0.07	1	*	*
	Small	62	93.5			4.29	0.88	20.87
1st care giving person	Others	57	80.7	0.76	0.31	1	*	*
	Govt. health care providers	58	93.1			2.21	0.47	10.36
TB patient delay	Present	41	78	1.23	0.10	1	*	*
	Absent	74	91.9			3.45	0.76	15.64
TB diagnostic delay	Present	80	82.5	1.93	0.09	1	*	*
	Absent	35	97			6.89	0.72	65.97
TB treatment delay	Present	57	80.7	2.07	0.023	1	*	*
	Absent	58	93.1			7.96	1.33	47.53

Discussion

Present study revealed that average time interval from appearance of symptoms to seeking care first time was 19.53±10.64 (mean ± SD) days. Similar finding was

shown by Ananth Krishnan et al¹² and Thakur et al¹³. But Purty et al¹⁴ showed higher (mean- 59.3 days) patient delay in their studies in Puducherry. The first point of contact was a governmental health centre for 50.4%

patients in the present study, more or less similar result found in the studies conducted by Ananth Krishnan et al¹², Selvam¹⁵ and Yamasaki-Nakagawa et al¹⁶.

Average time interval from care seeking first time to confirmation of final diagnosis was higher in the studies conducted by Thakur et al¹³ and Purty et al¹⁴ as compared to the present study. Lesser treatment delay (mean \pm SD – 1.74 \pm 2.87) was found by Thakur et al¹³ and quite higher treatment delay (mean \pm SD- 24.5 \pm 2.2) was shown by Purty et al.¹⁴

Regarding treatment success rate, present study showed higher rate than the study conducted by Lanjewar et al¹⁷ (77.78%) and lesser than the study conducted by Saha et al¹⁸(94.1%). Success rate was 3.5 times more for the patients who belonged to lower age group (95% CI was 1.13-10.79). Similarly, Gaur et al¹⁹ showed treatment success rate decreased in the older age group. Present study revealed female patients had higher success rate but Ahmed et al²⁰ found higher cure rate in males.

Significant association between all types of delay and unfavorable treatment outcome found in the present study. Similar finding was shown by Fatumo et al²¹ in Birmingham, Gebreeqziabher et al²² in Northwest Ethiopia and Virenfeldt et al²³ in Guinea-Bissau.

Conclusion & Recommendations

Intensive effort should be given to increase the literacy status of the population. Educational reforms are needed to focus on the children of lower socio-economic strata. Priority should be placed on women, Scheduled Castes and Scheduled Tribes and other weaker sections of society, who comprise the bulk of illiterate population in India.

Increasing knowledge of the first care giving persons is urgently needed to avoid delay in confirmed diagnosis and treatment. Monitoring and supportive supervision is needed at all the level of health care delivery to avoid health system delay in diagnosis and initiation of treatment of TB.

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Assessment of Risk of Obstructive Sleep Apnoea in Young Adult Population

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Abstract

Prevalence of Obstructive sleep apnoea (OSA) has been increasing nowadays owing to increase in its risk factors. Modified Berlin's Questionnaire is a standard tool to assess the risk of OSA in Indian setting. The present study was designed to assess the risk of OSA in young adults. 1500 subjects of both genders between 18 to 30 years of age were recruited, their BMI and blood pressure were measured and they were administered screening questionnaire first. Those who gave one or more positive response were administered modified Berlin questionnaire. The overall risk of OSA in the young adult population was 5.93%. The risk was higher in males as compared to females with odds ratio of 2.1. So, an individual having hypertension, obesity, snoring and wake time tiredness should be administered the Modified Berlin's Questionnaire to assess the risk of developing OSA to prevent development of OSA in future.

Key words: Obstructive sleep apnoea, Modified Berlin Questionnaire, Snoring, Wake time tiredness, Obesity, Hypertension

Introduction

Obstructive sleep apnoea (OSA) is a potentially disabling condition characterized by excessive daytime sleepiness, loud snoring, repeated episodes of upper airway obstruction during sleep and nocturnal hypoxemia. Obstructive sleep apnea has a major impact in public health and cardiovascular health since it is closely associated with several coronary disease risk factors like hypertension, arrhythmia, left ventricular dysfunction, as well as with coronary heart disease, stroke and pulmonary hypertension.¹ OSA is also associated with decreased quality of life (QOL), significant functional impairment, and increased risk of road traffic accidents.²

The prevalence of OSA has been increasing in India and abroad owing to its risk factors. A study done in

Delhi has shown the prevalence of OSA as 13.7%.³

Obesity, male sex, age, heritable factors, craniofacial anatomic predisposition are the known to be important risk factors for OSA.⁴ Out of these, Obesity is consistently recognised as one of the strongest modifiable risk factors for OSA. Given the worsening modern pandemic of obesity in society, the prevalence of OSA is likely to increase further. It is well recognized that there is a higher prevalence of OSA in men than women, with most population-based studies demonstrating a 2- to 3-fold higher prevalence of OSA in men. It is thought that up to 40% of the risk of OSA is genetically predisposed.² Also it has been shown that Sleep apnoea syndrome is profoundly associated with hypertension independent of all other relevant risk factors.⁵

Modified Berlin questionnaire is a validated instrument to determine the occurrence of risk of OSA. It is a standard questionnaire designed with certain modifications in Indian setting to identify patients at risk for the OSA. The original Berlin questionnaire is a standardized and validated tool to determine the

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risk of OSA in the western population which involves following information namely snoring behaviour, wake-time sleepiness or fatigue and the presence of obesity or hypertension. The questions were selected from literature to elicit factors or behaviors that, consistently predicted the presence of sleep-disordered breathing. The questionnaire had questions to enquire about symptoms of snoring, excessive daytime sleepiness, obesity and hypertension.^{6,7}

Not many studies has been carried for estimating risk of obstructive sleep apnea in young adults. in Indian setting. The present study aims to assess the risk of OSA in young adult males and females.

Objectives

1. To assess the risk of obstructive sleep apnoea in young adults using Modified Berlin Questionnaire.
2. To compare the risk of OSA in males and females.

Methodology:

Sample size:

Taking the prevalence of Sleep obstructive disorder = 13.7% with 99% confidence interval and 2.5% error, sample size of the study = 1240 rounded off to 1500.³

Methods

The study was conducted in Teerthankar Mahaveer Medical College and Research Centre, Moradabad, UP. 1500 Young adult subjects of either gender studying in Teerthankar Maharaveer University and residing in hostel in the age group of 18-25 years and volunteering for the study were recruited after taking informed consent from them. Ethical clearance was taken from Institutional ethical Committee. Subjects with history of alcoholism, chronic anxiolytic/sedative drug use, associated respiratory, renal, hepatic or cardiovascular disease or upper respiratory tract infection within the past one week as well as those who are pregnant were excluded from the study.

Assessment of risk of OSA by Modified Berlin's Questionnaire

All subjects were administered screening questionnaire. The screening questionnaire included

questions on leading questions on snoring, wake time tiredness, obesity and BP status. The subjects were called with their room mates to enquire about snoring details. Subjects who gave at least one positive response to the four screening questions of the questionnaire were administered detailed modified Berlin questionnaire. The detailed version includes 3 categories. Category 1 includes details of snoring with 6 questions, category 2 includes details of wake time sleepiness with 5 questions and category 3 includes details of BMI & high blood pressure. Categories 1 & 2 were enquired from the subjects and their room mates and category 3 was assessed by measurement of BMI & blood pressure. BMI > 25 kg/m² was considered as obese. Hypertension was classified according to JNC 8 guidelines. High BP was considered if systolic BP is > 140 mm Hg and/or diastolic BP > 90 mm Hg. Category 1 & 2 were interpreted as positive with positive responses for 2 or more questions. While category 3 was interpret as positive if either BMI > 25 kg/m² or Blood pressure is high. Final risk of OSA was noted if 2 or more categories had positive results.⁶

Measurement of BMI & blood pressure

Body weight was recorded (in kg) in all subjects, in erect position without footwear and wearing only light indoor clothes using a standard mechanical weighing scale and height in meters was measured using stadiometer. BMI was calculated using Quitelet's index i.e. weight (in kg) divided by height (in m²).

Blood pressure was measured with a BPL Digital Sphygmomanometer in sitting position after at least fifteen minutes of rest.

Statistics

Descriptive analysis was carried out to determine risk of OSA in young adult male and female population. Chi Square test was used to analyze the association of gender with risk of OSA. SPSS 20 was used to analyze the data thus obtained.

Results

1500 participants, who volunteered for the study were included in the study, of which 650 were males and 850 were females. All the subjects were asked to fill the 4 screening questions. Out of 650 male subjects 27.07 % (176) gave atleast one positive response to the

screening questions [Table 1] and out of 850 females, 16.59% (141) gave atleast one positive response to the screening questions [Table 1]. The overall risk of OSA in the young adult population was 5.93%. The risk of

OSA in adult male population was 8.31% while risk of OSA was present in 4.12% of females. Chi square test showed that males were more associated with risk of OSA compared to females with $p < 0.001$ (OR: 2.1 CI: 1.36 – 3.27)

Table 1: Percentage of positive responses to screening questions

Screening Questions	% of Positive response in males (n=650)	% of Positive response in females (n=850)
Snoring	13.07% (85)	6.59 % (56)
Tireness after waking up from sleep	9.23 % (60)	3.41% (29)
BMI > 25 kg/m ²	13.53% (88)	9.18 % (78)
High Blood pressure	2% (13)	3.41% (29)

Discussion

The present study was designed to estimate the percentage of young Indian adults having risk of developing OSA in future. Also, the present study intended to compare the risk of OSA in males and females. We found an overall 5.93% of young adults were at risk of developing OSA. The percentage of male subjects who were at risk was more than females with an odds ratio of 2.1.

Our study results were comparable to other similar studies done in India and abroad. A study done in South India on adults showed prevalence of OSA as 8.72% in total population.⁸ Another study done in South India done on middle aged adults of 30 – 65 years of age showed estimated population prevalence of OSA as 9.3%.⁹ A study done in Delhi showed the prevalence of OSA as 13.7%.³ A study done in Japan showed OSA prevalence to be 3.7%.¹⁰ A Korean study showed a prevalence of OSA in males and females as 4.5% and 3.2% respectively.¹¹

But some study results done in certain parts of India showed a very high risk of OSA above 20%. In a study done in Lucknow, high OSA risk was found in 20.6% of subjects.¹² Whereas another study done in Puducherry showed a higher risk in 25.8% of subjects.¹³ Another

study done in rural population in Odisha showed that 25% of the subjects had a high likelihood of developing OSA.¹⁴

Regarding gender variation, a study showed the prevalence of OSA is 9% for women and 24% in men in middle age group of 30-60 years.¹⁵ A Questionnaire based survey done by Pattanaik et al showed the overall prevalence of OSA in age group of 18 to 70 years as 13.7% and in the young adult age group (18 – 29 years) the prevalence was shown to be 12%. It also suggested that OSA was 2 -3 times more prevalent in men in comparison to women, and this has been linked to the pattern of fat distribution and difference in sex hormones.¹⁶

Similar to most studies done in India our study showed that males had more risk of developing OSA than females like a community-based study done in Delhi revealed that males were more associated with OSA than females with an odds ratio of 3.8.¹⁷

As discussed above, Berlin's Questionnaire takes in account four screening questions which are considered as the main risk factors of OSA viz snoring, day time sleepiness, BMI & Hypertension. Our study showed apart from Hypertension which was more prevalent in females (3.14% vs 2 %), other parameters were more prevalent

in males. BMI > 25 Kg/m² (13.53% vs 9.18 %) was more prevalent in males than in females so was the case of snoring with males 13.07% and females 6.59% and also self-reported day time sleepiness with 9.23% in males and 3.14% in females. Increased prevalence of snoring, wake time sleepiness and increased BMI contributed to higher risk of OSA in males in comparison to females.

Predisposition of males for OSA may be due to many factors. It has been shown that Men have narrower air passages than women and are more likely to snore.^{18,19} Moreover it has been reported that males are genetically more prone for snoring as suggested by a study which says self-reported symptoms of snoring and daytime sleepiness in older men have a genetic basis.²⁰ A few studies have showed lower snoring prevalence in the female population compared to male population for all age groups and attributed the pathogenesis of OSA to sex hormones. These studies revealed that OSA is more prevalent in post-menopausal women than pre-menopausal women, and hormone replacement therapy in post-menopausal women may protect against the disorder.^{2,21}

Conclusion

Our study showed the risk of developing OSA in young adult subjects as assessed by Modified Berlin's questionnaire in males and females as 8.31% and 4.12% with higher risk in males as compared to females. BMI is the main contributing modifiable factor for OSA. As OSA can lead to serious physical, emotional, psychological, economic and mental consequences, so recognizing the risk of OSA is very important to prevent development of full fledged OSA in future. Modified Berlin Questionnaire is validated and standardized tool to find the risk of OSA in Indian setting. So, a person having hypertension, obesity, snoring and day time tiredness should be administered the Modified Berlin's Questionnaire to assess the risk of developing OSA and they must take precautions like change their lifestyle, control their blood pressure if hypertensive and follow the sleep hygiene to prevent development of OSA in future. Some may require to undergo the gold standard Polysomnography to confirm the status of OSA.

Conflict of Interest: Nil

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Study of Sensory Processing Dysfunctions in Typically Developing Children and Children with Attention Deficit Hyperactivity Disorder

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Abstract

Aim: This study aims to identify the level of sensory processing dysfunction among typically developing children and children with Attention deficit and hyperactivity Disorder.

Objectives:

- To assess the level of sensory processing dysfunction among children with Attention Deficit and Hyperactivity Disorder.
- To assess the level of sensory processing dysfunction among typically developing children.
- To compare the level of sensory processing dysfunction between Children with Attention Deficit Hyperactivity Disorder and Typically Developing Children.

Methodology: Purposive sampling of 100 children were selected in mainstream schools and Occupational Therapy centers in Tamil Nadu. This study was done among the children between the age group of 4 to 9 years. Short sensory profile (SSP) was used as a measuring scale.

Result: This study results shows that 90% of the sample children showed some sensory processing dysfunction, comparatively Children with Attention Deficit Hyperactivity Disorder are showing higher level of sensory processing dysfunction (Mean Value is 100.46) than typically developing children (Mean is 152.56) on short sensory profile.

Conclusion: This study concludes that Sensory processing dysfunction is more commonly present in children with Attention Deficit and Hyperactivity Disorder whereas in typically developing children also sensory processing dysfunction was observed but most of them under probable difference. This study also suggests that the level of sensory processing impairment is high in children with ADHD than that of children who are normal and typically developing

Key Words: Attention Deficit and Hyperactivity Disorder, Short sensory profile, Sensory processing dysfunction

Introduction

Attention Deficit and Hyperactivity Disorder (ADHD) is a Neuro behavioral developmental disorder typically begins in childhood and persist in to adulthood. ADHD is characterized by developmentally inappropriate levels of inattention and impulsivity and hyper activity resulting in functional impairment

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in academic, family and social setting. Research have found that the social challenges of children with ADHD include disturbed relationship with their peers, difficulty making and keeping friendship, and deficiencies in appropriate social behavior. Long term outcome studies suggest that these problem continue in to adolescence and adulthood and impede the social adjustment of adult with ADHD.

Throughout the past decades in education there has been a severe rise in the number of children who suffer from ADHD. Handen¹ et al. noted, “ADHD affects 3% -5% of typically developing school age children and is characterized by over activity, impulsivity, and inattention across multiple environments”.

Sensory processing dysfunction

Sensory processing disorder (SPD) is a neurological condition that exists when sensory signals don't get organised into appropriate responses. People with Sensory Processing disorder find it difficult to process sensory information (e.g. sound, touch and movement) from the world around them. This means that they may feel sensory input more or less intensely than other people. Sensory processing dysfunction can therefore impact on a person's ability to interact in different environments and perform daily activities.

The majority of evidence describing sensory processing disorder stems from parental report, retrospective video tape analysis and first hand records of living with autism. Findings are limited to study, describing observable behavior indicative of sensory processing patterns and do include behavior studies, investigating the neurophysiologic process. Sensory processing dysfunction is a neurophysiologic condition in which sensory input either from the environment or from one's body is poorly detected, modulated or interpreted to which typical response is observed. It can also be considered as a disorder when they cause significant difficulties with daily routines and task. If a person has sensory processing dysfunction often the symptoms result in emotional, behavioral, social, intentional or mitotic problems. These secondary problems can take many forms and cook different depending on child and family content.

Sensory processing is divided into 3 major subtypes

- **Sensory modulation disorder-** In this group, individuals experience sensation at varying levels of intensity and have difficulty regulating responses. They may be more sensitive to one or more sensations such as noise, touch, or movement. Within this category, we often see children who either seek out extra input or who avoid input many of us would consider innocuous. it can be confusing to dissect behaviors of this children.

- **Sensory based motor disorder** - For these kids, Disorganized processing causes less than optimal motor output. We may see issues with balance, motor planning, coordination, postural control and/or endurance. These are the kids who appear clumsy, lethargic, or have difficulty keeping up with their peers.

- **Sensory discrimination disorder-** Those in this group have a more difficult time perceiving details of sensory input. It may take them longer than average to determine exactly what they're looking at, hearing or feeling. This could be the child who appears awkward with many fine and gross motor tasks or who often seems unaware of his surroundings.

It has been estimated by proponents that up to 16.5% of eliminator school aged children are having problem in sensory processing mainly tactile and auditory. An estimate of 13% of the 3-9 yrs children are to be affected with sensory processing dysfunction. Hence attempt has been done to find out the results among ADHD children and typically developing.

Aim

This study aims to identify the level of sensory processing dysfunction among typically developing children and children with Attention deficit and hyperactivity Disorder.

Objectives

- To assess the level of sensory processing dysfunction among children with Attention Deficit and Hyperactivity Disorder.

- To assess the level of sensory processing dysfunction among typically developing children.

- To compare the level of sensory processing dysfunction between Children with Attention Deficit Hyperactivity Disorder and Typically Developing Children.

Review of Literature

Inmaculada Fernandez²

The aim of this study was to find the quality of sensory processing and higher integrative functions in children with ASD from different environments. The main objective of this study is to compare sensory processing, social participation and praxis in a group of 79 children (65 males and 14 females) from 5 to 8 years of age ($M = 6.09$) divided into two groups: ASD Group ($n = 41$) and Comparison Group ($n = 38$). The *Sensory Processing Measure (SPM)* was used to evaluate the sensory profile of the children: parents reported information about their children's characteristics in the home environment, and teachers reported information about the same characteristics in the classroom environment. The most affected sensory modalities in the ASD Group were hearing and touch. Only in the ASD Group were significant differences found between the information reported by parents and what was reported by teachers: specifically, the teachers reported greater dysfunction than the parents in social participation ($p = .000$), touch ($p = .003$) and praxis ($p = .010$). These results suggest that the sensory profile assessment process needs the reports identified from two different environments which have to be concerned for the further treatment process.

Sharon A. Cermak (2008)³

The study describes the significant sensory differences under different circumstances of autism. Sensory modulation symptoms are common in persons with autism spectrum disorders (ASD); however have a heterogeneous presentation. Results from 14 studies indicated a significant high difference between ASD and typical groups in the presence/frequency of sensory symptoms, with the greatest difference in under-responsive, followed by over-responsive and sensation seeking. Three moderators that reduced the variability in findings among studies were: chronological age, severity of autism, and type of control group. Sensory differences were highest for studies of children ages

6–9 years, samples with more than 80% with an autism diagnosis, and compared to a CA matched versus a MA or DD matched group. It is important to consider these moderators in the design of studies and interventions addressing sensory symptoms.

Mary Alhage Kientz, Winnie Dunn(1996)⁴

The purpose of this study was to determine whether the Sensory Profile discriminates between children with and without autism and which items on the profile best discriminate between these groups. Parents of 32 children with autism aged 3 to 13 years and of 64 children without autism aged 3 to 10 years completed the Sensory Profile. A multivariate analysis of covariance (MANCOVA) on each category of the Sensory Profile identified possible differences among subjects without autism, with mild or moderate autism, and with severe autism. Follow-up analyses were conducted for any category that yielded a significant result on the MANCOVA. Eighty-four of 99 items (85%) on the Sensory Profile differentiated the sensory processing skills of subjects with autism from those of subjects without autism. There were no group differences between subjects with mild or moderate autism and subjects with severe autism. The study concluded that the Sensory Profile can provide information about the sensory processing skills of children with autism to assist occupational therapists in assessing and planning intervention for these children.

Winnie Dunn, K Westman(1997)⁵

The purpose of this study was to obtain data about a national sample of children without disabilities on the 125-item revision of the Sensory Profile, a tool derived from sensory history items reported in the literature and designed to evaluate children's responses to commonly occurring sensory events. Parents of 1,115 children completed the Sensory Profile. The children were 3 to 10 years of age and did not have disabilities. Parents used a 5-point Likert scale to report the percentage of time their children engaged in each behaviour. Researchers then analyzed the data, using multivariate methods to identify trends in performance and age and gender differences. Ninety-one (73%) of the profile's 125 items were found to be uncommon behaviours for this national sample of children without disabilities. Although age and gender differences were significant ($p < .001$), effect sizes were so small (i.e., below .2) that differences

were not meaningful for clinical application (i.e., mean differences less than .5 points). Only two items in the visual category approached a 1-point difference when comparing younger and older children. The study concluded that there were no meaningful gender differences on the revised Sensory Profile, and only 2 items approached a meaningful difference related to age. Nearly three fourths of the items on the profile were uncommon for children without disabilities. This study also suggests when the children with various disabilities display these behaviours, the Sensory Profile can be useful in evaluation and program planning for children with disabilities.

Julie Ermer, Winne Dunn(1997) ⁶

The purpose of this study was to determine which factors on the Sensory Profile, a measure of children's responses to commonly occurring sensory experiences, best discriminate among children with autism or pervasive developmental disorder (PDD), children with attention deficit hyperactivity disorder (ADHD), and children without disabilities. Data for three groups of children 3 to 15 years of age were used: 38 children with autism or PDD, 61 with ADHD, and 1,075 without disabilities. The researchers conducted a discriminate analysis on the three groups, using group membership as the dependent variable and the nine factors of the Sensory Profile as independent variables. The analysis yielded two Discriminant functions: one that differentiated children with disabilities from children without disabilities and another that differentiated the two groups of children with disabilities from each other. Nearly 90% of the cases were correctly classified with these two functions. The Sensory Profile is useful for discriminating certain groups of children with disabilities. This study also suggests that patterns of behaviour associated with certain developmental disorders are reflected in populations of children without disabilities.

Methodology

The purpose of the study is to identify the level of sensory processing dysfunction in children with Attention Deficit and Hyperactivity Disorder and Typically Developing children.

Research Design

Descriptive study design was used in this study to investigate the level of functioning in children age matched 4-9 yrs.

Population

The study involved children between age group of 4 to 9 years who are normal, typically developing and ADHD.

Sample Size: 100 subjects participated in this study

Sampling Technique : Purposive sampling technique was adopted.

Study Place

The study was conducted at Mainstream schools in Erode and Namakkal Districts of Tamil Nadu and Occupational Therapy centres in Erode, Namakkal, Karur and Tirupur Districts of Tamil Nadu.

Inclusion Criteria

- Age between 4 to 9 years
- Both male and female were selected
- Children Studying in Mainstream education and Diagnosed as ADHD by Developmental pediatrician.

Exclusion Criteria

- Age below 4 years and above 9 years was excluded
- Children reported with developmental delay, taking medications
- children with seizure episodes are excluded

Research Tool : Short Sensory profile⁷

Data Analysis And Result

Table 1: Comparison of short sensory profile Scores between Typically Developing and ADHD children in Tactile sensitivity

SENSORY DOMAIN	GROUP	Mean	SD	't' VALUE	'p' VALUE
TACTILE	Typically Developing	24.3	3.370	10.658	0.0001
	ADHD	16.32	4.083		
TASTE AND SMELL	Typically Developing	17.16	1.973	10.791	0.0001
	ADHD	11.17	2.983		
MOVEMENT AND SENSE	Typically Developing	13.22	1.419	8.995	0.0001
	ADHD	9.68	2.394		
UNDERRESPONSIVE/ SEEKING	Typically Developing	25.38	3.999	9.812	0.0001
	ADHD	17.22	4.311		
AUDITORY SENSITIVITY	Typically Developing	25.94	2.705	14.037	0.0001
	ADHD	16.04	4.189		
ENERGY SENSITIVITY	Typically Developing	25.28	3.169	9.700	0.0001
	ADHD	17.46	4.739		
VISUAL/AUDITORY SENSITIVITY	Typically Developing	21.54	1.897	9.949	0.0001
	ADHD	14.04	4.981		

Table 2: Comparison of total score of short sensory profile between ADHD Children and Typically developing children

GROUP	Mean	SD	't' VALUE	'p' VALUE
Typically Developing Children	152.56	8.500	25.654	0.0001
ADHD Children	100.46	11.574		

Discussion

Using the short sensory profile total score as an overall indicator of sensory processing response, children with ADHD were often reported to have sensory processing impairments whereas children in the typically developing group were not. According to the table the highest frequency of dysfunctional sensory processing is observed in group of children with ADHD.

Table 1 shows the sensory processing dysfunction faced by children with ADHD and typically developing children on the basis of Tactile sensitivity, Mean values of typically developing children is 24.3 and ADHD children is 16.32, “t” value is 10.658. it shows the significant difference between groups on tactile sensitivity. Similarly on taste and smell domain mean value of typically developing children is 17.16 and mean value of ADHD Children is 11.17 and “t” values is 10.79. it indicates the significant difference between the groups.

On movement and sense domain the mean value of typically developing children is 13.22 and mean value of ADHD children is 9.68 and “t” value is 8.99. In under responsive or seeking domain the mean value of typically developing children is 25.38 and mean value of ADHD children is 17.22 and “t” value is 9.81. In auditory sensitivity domain mean value of typically developing children is 25.98 and ADHD children is 16.04 and “t” value is 14.03. similarly in energy sensitivity domain the mean value of typically developing group is 25.28 and ADHD group is 17.46 and “t” value is 9.7. In visual and Auditory sensitivity domain mean value of typically developing children is 21.54 and mean value of ADHD children is 14.04 and “t” value is 10.65. higher the mean value indicates typical performance whereas lower the mean value indicates definite difference in sensory processing dysfunctions.

Table 2 shows the sensory processing dysfunction faced by children with ADHD and typically developing. Mean value of typically developing children is 152.56 and ADHD children is 100.46 and “t” value is 25.654 and p value 0.0001. These results begin to confirm the prevalence and types of sensory processing dysfunctions in ADHD Children.

Conclusion

The majority of children with Attention deficit hyperactivity disorder in this sample were reported to have difficulties with processing and responding to sensory input on the short sensory profile. Children were reported to be inattentive, under responsive and sensitive to tactile input. They also were reported to seek sensory input and have difficulties in filtering auditory input. The Attention deficit hyperactivity disorder group performed significantly different when compared to other typically developing age matched children. Sensory processing dysfunction is more commonly present in children with ADHD whereas in typically developing children also sensory processing dysfunction was observed but most of them under probable difference.

Ethical Clearance : Institutional Ethical committee Approved.

Source of Funding : Self.

Conflict of Interest : NIL

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Study of Bacterial Spectrum in Diabetic Foot Ulcers

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Abstract

Introduction: Diabetic foot ulcerations, infections and their sequelae are one of the leading causes of mortality and morbidity, especially in the developing countries. It is essential to assess the magnitude of bacterial infection in the lesions to avoid further complications and save the diabetic foot. **Aims and Objectives:** This study was carried out to determine the bacterial profiles of infected ulcers and the antibiotic resistance pattern of the isolates. **Methods and Material:** Eighty six diabetic foot patients underwent detailed history, clinical examination, and laboratory investigations including parameters of systemic infections. Microbial culture and sensitivity were performed at the time of presentation. **Results:** Among 86 cases, 37.2% had mono-microbial infection, 54.6% had poly-microbial infections, and 8.1% had sterile culture. Gram negative aerobes were the most frequently isolated bacteria constituting 84 isolates (64.1%), followed by gram-positive aerobes 45 isolates (34.8%). The most frequently isolated aerobic organisms were *Pseudomonas aeruginosa* and *Staphylococcus aureus*. Antimicrobial sensitivity pattern of the isolates were done in which Imepenem was found to be effective against Gram Negative Infections. **Conclusion:** There is a growing trend of isolating gram negative bacteria in these naïve lesions of the diabetic foot. The need for adequate gram negative antibacterial coverage at the commencement of diabetic foot therapy is essential to prevent and treat limb/life threatening infections.

Key Words: Diabetic Foot Infections, Empirical Antimicrobial therapy, Imepenem, Piperacillin tazobactam

Introduction

Diabetes mellitus is a chronic endocrine disorder that affects large segment of population and is a major public health problem.⁽¹⁾ The Indian diabetic population is expected to increase to 57 million by the year 2025.⁽²⁾ Diabetes and foot problems are almost synchronous, the impaired micro-vascular circulation in patients with a diabetic foot limits the access of phagocytes, thus favouring the development of an infection, the individuals with diabetes have at least a 10-fold greater risk of being hospitalized for soft tissue and bone

infections of the foot than individuals without diabetes.^(1,2)

A diabetic foot infection is simply defined as any infra-malleolar infection in a person with diabetes mellitus.⁽³⁾ Diabetic foot ulcer (DFU) is characterized by several pathological complications such as neuropathy, peripheral vascular disease, foot ulceration, and infection with or without osteomyelitis, leading to the development of gangrene and it is one of the chronic wound infection which leads to non-traumatic lower limb amputation.^{2,3}

Majority of the diabetic foot lesions are initially treated empirically based on the prevalence of the microbial pattern in the locality and the hospital.⁴ Many studies have reported on the bacteriology of Diabetic Foot Infections (DFIs) over the past 25 years, but the results have been varied and often contradictory, these discrepancies could partly have been due to the differences in the causative organisms, which had

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occurred over time, geographical variations, or the type and the severity of the infection.²

Mostly, the diabetic foot infections are mixed bacterial infections and the proper management of these infections requires an appropriate antibiotic selection, based on the culture and the antimicrobial susceptibility testing results, in addition to administering regular glycemic control, wound care, surgical debridement, pressure offloading, and maintaining adequate blood supply.^{2,5} As there is a growing trend of isolating gram negative bacteria in these naïve lesions of diabetic foot, the empirical antimicrobial therapy should be comprised of antibiotics to cover both gram negative and gram positive antibiotics.^{4,6,7}

Patterns of microbes infecting diabetic foot wounds have been studied widely. Bacterial profiles have been reported from various regions indicating area-specific studies to be conducted for assessing the problem of DFI (diabetic foot infection) and instituting effective treatment. Within the same context, the current study was undertaken as an attempt to examine the major populations of bacteria which were associated with the bio burden of infected diabetic foot ulcers.²

Materials and Methods

A prospective study was carried out on 86 patients with foot ulcer from surgery unit, Sri Lakshminarayana Institute of Medical Sciences, Pondicherry during the period of December 2017 to February 2019. The criteria for inclusion in this study were presence of foot infection in diabetics of grade 1 and above. A clinical history was elicited with regards to the duration of diabetes, the type of treatment which was received and the presence of other systemic illnesses. (Table:1,2,3)

Samples were collected from the deeper portion of the ulcers by using sterile swabs which were dipped in sterile glucose broth. The samples were collected by making a firm, rotatory movement with the swabs. All the samples collected were immediately brought to the laboratory and then processed. Two swabs were collected, one swab was used for Gram staining and the other was used for culture. A direct Gram stained smear of the specimen was examined. The specimens were inoculated on to blood agar and Mac Conkey's agar. The inoculated plates were incubated at 37°C overnight

and the plates were examined for growth, the next day. The further processing was done according to the nature of the isolate, as was determined by Gram staining and the colony morphology. The organisms were identified on the basis of their Gram staining properties and their biochemical reactions. The antibiotic susceptibility testing was done by the Kirby Bauer disc diffusion method, as per the CLSI guidelines, 2011.⁸

The antimicrobial discs which were used were those of Ampicillin (10µg), Gentamicin (10µg), Amikacin (30µg), Amoxy+clavum (20/10µg), Ciprofloxacin (5µg), Ceftazidime/Clavulanicacid (30/10µg), Ticarcillin Clavum(75/10µg), Cefotaxime (30µg), Ceftriaxone(30µg), Cefoperazone/sulbactam (75/10µg), Piperacillin/tazobactam (100/10µg), Imipenem (10µg), for the Gram negative bacilli.

Penicillin (10 units), Ampicillin (10µg), Cefoxitin (30µg), Cefotaxime (30µg), Chloramphenicol (30µg), Clindamycin (2µg), Erythromycin (15µg), Oxacillin (1µg), Vancomycin (30µg), Ciprofloxacin (5µg), Linezolid (15µg), Cotrimoxazole(25µg), Rifampicin (5µg), and Tetracycline (30µg) were used to study the susceptibility patterns of the Gram positive cocci.

Results

Of the total 86 diabetic foot patients studied 59 were males and 27 were females, the male:female ratio being 2:1. Their ages ranged from 39 years to 83 years. The maximum number of patients having diabetic foot infections was in the age group of 58-67 years, the cases had diabetes mellitus for more than a decade. Among the 86 cases 47 (54.6%) were polymicrobial, 32 (37.2%) were mono microbial and 7 (8.1%) were sterile. Altogether 129 organisms were isolated from 86 cultures. Among the 129 organisms, 84 (65.1%) were gram negative and 45 (34.8%) were gram positive. *Pseudomonas aeruginosa* 24 (18.6%) was the most common isolate followed by *Staphylococcus aureus* 20 (15.5%), *Escherichia coli* 18 (13.9%), *Proteus* 12(9.3%), *Streptococci* 12 (9.3%), *Citrobacter sp* 10 (7.7%), *Klebsiella* 9(6.9%), Coagulase negative *Staphylococcus* 9(6.9%), *Enterococcus sp* 4 (3.1%), *Providencia* 2(1.5%), *Acinetobacter sp.*6(4.6%), *Enterobacter sp.* 2(0.7%) and *Candida* 1(0.7%).(Table:4)

Among the 32 cases of mono microbial infection, Gram-negative infection was seen in 19 (59.3%) cases, whereas both Gram-positive and Gram-negative were high 27(57.4%) in cases with poly-microbial infection 20(42.5%). Isolated bacteria showed differential sensitivity patterns against commonly used antibiotics. The majority of the isolates were resistant to several

antibiotics that are usually prescribed on an empirical basis. Antibiotic sensitivity of the isolated microbes showed highest sensitivity for Imepenem, Cefeperazone sulbactum and Piperacillin/tazobactum for gram negative organisms. Linezolid and Vancomycin showed good sensitivity against Gram positive organisms. (Table: 5,6)

Table 1: Characters, Frequency and Percentage

Characters	Frequency	Percentage
Type of diabetes mellitus		
Type- 1	1	1.1%
Type-II	85	98.8%
Duration of diabetes Mellitus		
1-5 yrs	29	33.7%
5-10 yrs	23	26.7%
More than 10 yrs	13	15.1%
Not known	21	24.4%
Random Blood Sugar at the time of admission		
Less than 200mg/dl	18	20.9%
Greater than 200mg/dl	68	79%
Co-morbid conditions among type II Diabetic patients (n=85)		
Osteomyelitis	14	16.4%
Neuropathy	58	68.2%
Nephropathy	12	14.1%
Septicaemia	2	2.3%
Gangrene	19	22.3%
Retinopathy	1	1.1%
Peripheral Vascular disease	21	24.7%
Hypertension	49	57.6%
History of Amputation		
Performed	32	37.6%
Not performed	54	63.5%

Table 2: Age and Gender distribution

Age	Male	Female	No of patients
Less than 40	2	1	3
41-50	11	3	14
51-60	19	9	28
61-70	21	12	33
71-80	4	2	6
81-90	2	0	2

Table 3: Wagner’s Grade

Wagner’s Grade	No. of Patients	Flora		
		Sterile	Mono	Poly
Grade-1	3	1	1	1
Grade-2	17	2	6	9
Grade-3	32	4	13	15
Grade-4	29	0	11	18
Grade-5	5	0	1	4
Total	82	7	32	47

Table 4: Antimicrobial susceptibility pattern of Gram Positive bacterial isolates from infected foot ulcers in diabetic patients (n =)

Antibiotic	S.aureus n=20	CONS n=9	Streptococci n=12	Enterococci n=4
Methicillin Sensitive	12(60%)	7(77.7%)	-	-
Methicillin Resistant	8(40%)	2(22.2%)	-	-
Penicillin	-	-	4	-
Amikacin	8(40%)	8(88.8%)	-	-
Ampicillin	16(80%)	-	6	2(50%)

Cont ... Table: 4: Antimicrobial susceptibility pattern of Gram Positive bacterial isolates from infected foot ulcers in diabetic patients (n =)

Erythromycin	16(80%)	7(77.7%)	6	4(100%)
Tetracycline	-	-	0	3(75%)
Clindamycin	3(15%)	1(11.1%)	3	-
Cotrimoxazole	-	4(44.4%)	-	2(50%)
Ciprofloxacin	5(25%)	3(33.3%)	-	3(75%)
Chloramphenicol	-	2(22.2%)	5	2(50%)
Rifampicin	5(25%)	3(33.3%)	-	2(50%)
Vancomycin	1(5%)	0	0	1(25%)
Linezolid	2(10%)	3(33.3%)	0	0

Table: 5: Antimicrobial resistance pattern of Gram negative bacterial isolates from infected foot ulcers in diabetic patients (n =)

Antibiotics	Pseudomonas n=24	E.coli n= 18	Proteus n= 12	Citrobacter n=10	Acinetobacter n=6	Klebsiella n=9	Providencia n=2	Enterobacter n=2
Ampicillin	-	16(88.8%)	12 (100%)	8(80%)	5(83.3%)	6(66.6%)	2(100%)	2(100%)
Amikacin	5(20.8%)	8(44.4%)	1(8.3%)	0	3(50%)	6(66.6%)	1(50%)	1(50%)
Amoxy+ clavum	6(25%)	9(50%)	6(50%)	1(10%)	4(66.6%)	6(66.6%)	0	1(50%)
Ciprofloxacin	8(33.3%)	8(44.4%)	2(16.6%)	0	2(33.3%)	5(55.5%)	1(50%)	2(100%)
Cefotaxime	7(29.1%)	9(50%)	7(58.3%)	6(60%)	3(50%)	5(55.5%)	1(50%)	1(50%)
Ceftazidime/ Clavulanic acid	6(25%)	10(55.5%)	1(8.3%)	3(30%)	1(16.6%)	2(22.2%)	0	1(50%)
Cefaperazone Sulbactam	5(20.8%)	10(55.5%)	1(8.3%)	3(30%)	4(66.6%)	0	1(50%)	1(50%)
Piperacillin tazobactam	4(16.6%)	9(50%)	5(41.6%)	2(20%)	2(33.3%)	5(55.5%)	0	1(50%)
Imepenem	2(8.3%)	0	1(8.3%)	0	0	0	0	0
Gentamicin	8(33.3%)	12(66.6%)	2(16.6%)	-	4(66.6%)	7(77.7%)	1(50%)	-
Ticarcillin-Clavum	4(16.6%)	6(33.3%)	2(16.6%)	-	4(66.6%)	6(66.6%)	1(50%)	-

Discussion

The prevalence of diabetic foot ulceration was found to be 68.6% in males and 31.3% in females. The most common risk factors for diabetic foot ulceration include neuropathy, poor glycaemic control, ischaemia and infection. Diabetic neuropathy was seen in 68.2% of our patients with diabetic ulcers. The detection of neuropathy before the development of its complications is the best way to prevent diabetic foot infections⁹.

In the present study the maximum number of patients with infected diabetic foot ulcers belonged to Wagner grade 3 and 4. Severe diabetic foot infections usually yield polymicrobial isolates, whereas mild infections are frequently monomicrobial. In cases of severe diabetic foot infection, three to five organisms may be cultured.⁶ Polymicrobial nature of diabetic foot infections have been observed in various studies in subcontinent and abroad.^{2,10,11,12} We observed that Gram-negative infections were more common in the studied population as recent studies reported a predominance of gram negative aerobes^{1,2,3,7,20}. In previous reports, researchers have shown the predominance of Gram-positive infections in their regions.^{9,10,13,14,6,15,16,17,18}

In our study, *Pseudomonas aeruginosa* (18.6%) was the predominant pathogen isolated, followed by *Staphylococcus aureus* (15.5%) *Escherichia coli* (13.9%), which was in accordance with the findings of the study which was conducted by Ekta Bansal et.al.¹² Priyadarshini Shanmugam et.al and Pappu AK et.al. also made similar observation and found *Pseudomonas aeruginosa* 16%, *Escherichia coli* 14.6% and *Staphylococcus aureus* 13.3% and *Pseudomonas aeruginosa* 23%, *Staphylococcus aureus* 21% and *Escherichia coli* 12% as the most common pathogens. Our results are similar to many studies in the southern parts of our country the reason could be the similar geographical locations.

As regards to antibiotic sensitivity pattern of Gram negative bacilli more than 60% strains were sensitive to cephalosporins, Imepenem showed more than 95% sensitivity similar to the studies of J.Vimalin Hena et.al.¹⁰

Pseudomonas is 91.7% sensitive to Imepenem, 16.6% resistance to Piperacillin tazobactam, 20.8%

resistance to Amikacin, and 33.3% resistance to Ciprofloxacin almost similar findings were seen with G.S.Banashankari.et.al.⁴, where *Pseudomonas* is 100% sensitive to Imepenem, 25% resistance to Piperacillin tazobactam, 25% resistance to Amikacin, and 38% resistance to Ciprofloxacin, in similar *E.coli* showed 100% sensitive to Imepenem, Amikacin 44.4% and Ciprofloxacin 44.4% and the findings with G.S.Banashankari.et.al. for *E.coli* are Imepenem 100% Amikacin 45%, Ciprofloxacin 45%.

Proteus exhibited 100% resistance to Ampicillin, 50% resistance to Amoxy+Clavum and 8.3% resistance to Cefeperazone sulbactam; similar to the studies of Ekta Bansal et.al., which showed 100% resistance to Ampicillin, 50% resistance to Amoxy+Clavum and 100% sensitive to Cefeperazone sulbactam.

Imepenem is the drug of choice in infection caused by *Pseudomonas*, *E.coli*, *Proteus*, *Acinetobacter* and *Klebsiella* which exhibited more than 90% sensitivity, similar to the findings of G.S.Banashankari et.al., and Ekta Bansal et.al.

Pertaining to *S.aureus* 40% strains were Methicillin resistant and 25% of the isolated *Enterococcus* strains were resistant to Vancomycin. *Enterococci* and Gram-negative *Citrobacter*, *Providencia* are considered commensals with low virulence whereas they may cause severe tissue damage in diabetic patients.¹⁹

Imipenem, Piperacillin/tazobactam and Cefeperazone / sulbactam were the agents which were most effective against gram negative organisms, while Linezolid and Vancomycin were effective against the gram positive organisms.

Conclusion

Both Gram positive cocci and Gram negative bacilli caused diabetic foot infections and this study showed a preponderance of Gram negative bacilli. There is a growing trend of isolating gram negative bacteria in these naïve lesions of the diabetic foot. The need for adequate gram negative antibacterial coverage at the commencement of diabetic foot therapy is essential to prevent and treat limb/life threatening infections. Knowledge on the antibiotic susceptibility pattern of the isolates from diabetic foot infections is crucial for

planning the appropriate treatment of these cases, prior to getting the susceptibility reports from the laboratory. Since there is an increasing rate of multidrug resistant organisms, there is a need for continuous surveillance to provide the basis of the empirical therapy and to reduce the risk of the complications. The inadvertent use of broad spectrum antibiotics should be discouraged. The selection of the antibiotic treatment should be based on the predominant organisms which are isolated and their antimicrobial susceptibility patterns. This will improve the overall antibiotic utilization and reduce the emergence of multidrug resistant organisms. The detection of neuropathy before the development of its complication is the best way to prevent the diabetic ulcer complications.

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Socio-demographic Variables Affecting Services Utilization Under Integrated Child Development Scheme (ICDS) in Bikaner - A Cross-Sectional study

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Introduction The Integrated Childhood Development Services (ICDS) scheme is India's foremost program imparting comprehensive and cost-effective services related to women and child beneficiaries. Still the level of coverage of the services is matter of concern in present day scenario. To find utilization of ICDS services and relation of various socio-demographic variables with utilization of services the study was proposed. **Objective:** To assess utilization and various socio-demographic variables affecting utilization of Integrated Child Development Scheme (ICDS) services. **Methods** A cross-sectional study was done in 1548 beneficiaries residing in service delivery area of Rural and Urban Health Training Centers of Bikaner, to assess effect of various socio-demographic variables on utilization of services provided under ICDS. The information was collected and entered in MS excel. **Results** This study revealed that 815(52.65%) beneficiaries utilized at least one service provided under ICDS. 50.69% urban study population and 54.71% of rural study population utilized the services. Among the significant variables affecting utilization of ICDS were religion, caste, nature of family, socioeconomic status and occupation. **Conclusion** This study revealed that utilization of services among rural and urban beneficiaries was almost similar, nearly half of the beneficiaries utilized the services. The role of various socio-demographic variables was significant in level of utilization of services in a particular group. IEC and BCC activities should be done in community to increase utilization of ICDS services by beneficiaries residing under service area of an Anganwadi.

Keywords: ICDS services utilization, socio-demographic variables, Anganwadi

Introduction

Integrated Child Development Services (ICDS) is an important universal scheme, implemented on 2nd October 1975, under Department of Social Welfare. ICDS lay foundation for the development of nation's human resource by providing an integrated package of early childhood services, to improve the nutrition and health status of children 0-6 years, pregnant and lactating mothers and adolescent girls of 11-18 years. The beneficiaries under ICDS are- Children less than 6 years, Adolescent girls 11-18 years, Pregnant women, Lactating mothers & women 15-45 years.

By 2019, 7075 ICDS projects and 13,72,872 Anganwadi centres were operational across 28 States & 9 Union Territories.¹ In Rajasthan there are 304 projects having 61,974 Anganwadi center operational, with registration of 17,09,488 children below three years of age, 9,57,669 children three to six years of age, 1,73,591 adolescent girls, 8,75,613 pregnant women and lactating mothers. In Bikaner there are seven rural and one urban block having 1327 Anganwadi centre out of them 1298 are operational.²

In Family Health Survey (2015-16) 39.1% of children under age of five years were found stunted (height-for-age), 23% of children under age of five years were wasted (weight-for-height) and of these 8.6% were severely wasted. 36.7% of children under age of five years were underweight (weight-for-age).³

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Despite several achievements that the ICDS scheme has witnessed during its four decades of implementation, there is a continued need of achieving the targeted goals in the field of mother and child nutrition so to assess the level of utilization and effect of various socio-demographic variables on utilization of services provided under ICDS study was proposed.

Materials and Methods

Study area: service delivery area of Rural and Urban Health Training Centers under Sardar Patel Medical College Bikaner. **Study population:** Beneficiaries of ICDS services. **Study design:** A cross-sectional study. **Study period:** January 2019 to August 2019. **Study sample:** Taking utilization of services of Anganwadi P as 77⁴ with, absolute precision 5% at confidence level 95%, the minimum sample size estimated as⁵ $n = Z^2_{(1-\alpha/2)} (p \times q) / d^2$ where $Z^2_{(1-\alpha/2)} \cong 4$ $p=0.77$, q is $1-p$, $d^2=(0.05)^2$ is precision, $n=283$

Inclusion criteria: Children 6 months to 6years, Adolescent girls (11-18yrs) Pregnant women, Lactating mothers delivered in last one year, Other women 15-45 years **Exclusion criteria:** Beneficiaries not residing in field practice area of Rural and Urban Health Training Centre, Bikaner, Children below 6 months, Lactating mother delivered more than one year ago, Beneficiaries of ICDS not willing to participate in study. **Study tool:** A schedule consisting of two parts had been used. Schedule Part-I- Information regarding Socio-demographic profile of family. Schedule Part-II consists of questions relating to utilization of services under Integrated Child Development Scheme (ICDS) services.

Methodology: Study population under Rural Health Training Centre and Urban Health Training Centre. Of Sardar Patel Medical College Bikaner were selected. Assuming at least one ICDS beneficiary present in one house 283 houses each in rural and urban area were surveyed. A systematic sampling procedure was taken, every Kth house where K refer to sample interval. 1427 houses under rural training centre area⁶, 2383 houses under urban health training centre.⁷

$$“K”_{rural} = 1427 / 283 \cong 5,$$

$$“K”_{urban} = 2383 / 283 \cong 8$$

So in rural area every fifth house was surveyed and in

urban area every eighth house was visited for assessment of utilization of services provided under ICDS by beneficiaries. In the 566 houses thus surveyed (283 rural & 283 urban) 753 beneficiaries were actually present in rural study area, 795 beneficiaries were present in urban study area, whom all (1548) were then interviewed.

Data was collected by house to house visit. First house was selected with help of random numbers. Then moving leftwards every fifth house in rural and every eighth house in urban area was visited for collection of information. If the selected house was locked on day of visit, the information was collected from next house. For collection of information beneficiaries and mother/guardians of beneficiaries in case of children, were interviewed in a language they could easily understand.

Statistical analysis: The data was entered in Microsoft excel sheet and Chi square was used to assess association. **Ethical Approval:** Ethical clearance was obtained from the Institutional Ethics and Research Board of Sardar Patel Medical College Bikaner prior to data collection.

Results

Majority of beneficiary 484(31.27%) were women 15-45 years followed by 357(23.06%) belonging to children 6 months to 3 years group, 287(18.54%) belonged to children 3 to 6 year group, next were lactating mothers 163(10.53%) and pregnant women 161(10.40%) and the least were adolescent girls, they were 96(6.20%) of total study population.

Table: 1-Distribution of study population according to beneficiary group.

Beneficiary Group	Beneficiaries n=1548	
	No.	Percentage
Children 6months-3years	357	23.06
Children 3-6years	287	18.54
Adolescent Girls	161	10.40
Pregnant Women	96	6.20
Lactating Mothers	163	10.53
Women 15-45years	484	31.27
Total	1548	100.00

Socio-demographic profile

In our study majority of study population were Hindus (88.76%) followed by Muslims (9.43%) and remaining were Jain (1.49%) and Sikh (0.32%). Categorization of our study population on basis of caste showed that subject belonging to Other Backward Caste were maximum (56.27%) followed by Scheduled caste (28.10%) and remaining belonged to Other caste (15.63%). None of the beneficiary was from Scheduled Tribe In our study the study population belong equally to nuclear and joint families (nuclear-50.19% and joint-49.81). Distribution of study population on basis of socioeconomic status showed majority belonged to socioeconomic status of Middle class-III (37.86%), followed by Upper Middle class-II (31.91%), lower middle class-IV(27.39%), upper class-I(1.94%) and least were from lower class-V (0.09%). Distribution of study population/guardians (in case of children less than 6 years) on basis of education in our study showed that majority were educated up to Primary & Middle (51.49%) followed by Illiterate & just Literate (26.16%), Secondary & Senior secondary level(16.60%) and least were Graduate & above (5.75%). Occupation wise distribution of respondents in our study showed that 84.24% were House-wife, 7.49% were Student, 2.91% were Dependent and remaining 5.36% were Working.

Table: 2-Distribution of study population according to utilization of ICDS services.

ICDS Service utilization	Beneficiaries n=1548	
	No.	Percentage
Utilizing	815	52.65
Not Utilizing	733	47.35
Total	1548	100.00

Nearly equal distribution was found among utilization and non utilization of at least one ICDS service by beneficiaries. Among total 1548 beneficiaries 815 (52.65%) beneficiaries utilized any services provided under ICDS. Hindus were the major utilizers (55.02%). Among various caste other caste OBC & SC were utilizing nearly equally (55.11 % & 54.25%).

Majority of beneficiaries belonging to Joint families were utilizing services (63.29%). Lower class and Lower Middle class were utilizing higher at 64.29% & 60.61% respectively. Nearly equal beneficiaries were utilizing the services and in all groups of education level. Major utilizer beneficiaries according to occupation of respondent were House-wife 58.67%. A very highly significant association was found in various group and non utilization of ICDS services-Religion, Caste, Nature of family, Socioeconomic status & Occupation of beneficiary/guardian

Discussion

In our study overall 52.65% beneficiaries utilized at least any one service provided under ICDS, 54.71% and 50.69% beneficiaries from rural and urban area respectively utilized at least one of services provided under ICDS. In our study utilization of ICDS service was found higher in case of urban area and lower in rural area as compared with NFHS 4 (urban-40%, rural-59%).

Other studies showed higher utilization Meena JK (58.3%), Davis S F et al (60.6%), Patil K S & Kulkarni M V (77.15%), Bhagat V. M (89.29%), the reason behind lower utilization in our study may be may be lack of awareness about ICDS services among study population.^{4 8 9 10 11}

Socio-demographic variable affecting ICDS service utilization

In this study various socio-demographic variable were assessed for significant effect on utilization. In our study religion of beneficiary was found to a significant variable, while in the study done by Bhagat V M it was found to be insignificant. The reason may be lack of awareness and participation among other religions than Hindus in our study area.

In our study caste variable was found significant in utilization of ICDS services. The reason for this finding may be due less awareness about beneficial role of ICDS among various communities in our study area,

In our study nature of family was also a significant variable in service utilization of ICDS, while nature of family was not found significant in study conducted by Bhagat V M and Patil K S & Kulkarni M V. The reason for this difference in finding may due to traditionally

joint system of family plays an important role in utilization of ICDS services in our study area.

Table: 3-Utilization of ICDS services according to various socio-demographic variables.

Utilization of ICDS services						
Variables	Total (n)	Number	Percentage	χ^2	df	P
Total	1548	815	52.65	-	-	-
Study Area						
Rural	753	412	54.71	2.51	1	0.113
Urban	795	403	50.69			
Religion						
Hindu	1374	756	55.02	29.99	3	0.0001
Jain	23	8	34.78			
Muslim	146	51	34.93			
Sikh	5	0	0			
Caste						
OBC	871	480	55.11	15.94	2	0.0003
Other	242	99	40.91			
SC	435	236	54.25			
Nature of Family						
Joint	771	488	63.29	69.83	1	0.0001
Nuclear	777	327	42.08			
Socioeconomic status						
Lower Class	14	9	64.29	36.34	4	0.0001
Lower Middle Class	424	257	60.61			
Middle Class	586	327	55.8			
Upper Middle Class	494	208	42.11			
Upper Class	30	14	46.67			
Education of respondent						
Illiterate & Literate	405	204	50.37	2.48	3	0.4789
Primary & Middle	797	435	54.58			
Secondary & Senior Secondary	257	131	50.97			
Graduate & above	89	45	50.56			
Occupation of respondent						
Dependent	45	12	26.67	161.66	3	0.0001
House-wife	1304	765	58.67			
Student	116	0	0			
Worker	83	38	45.78			

Our study showed a significant difference in utilization of ICDS services according to socio-economic status, these findings were consistent with the study done by Bhagat V M and Patil K S & Kulkarni M V. Our study showed no significant difference in utilization of ICDS services and educational status, similar finding was also seen in study carried out by Patil K S & Kulkarni M V. However education was found significant variable in a study by Bhagat V M. Our study revealed that occupation is a significant variable in utilization of ICDS services, these findings were consistent with finding in a study by Bhagat V M. The level of significance of occupation was not found in study conducted by Patil K S & Kulkarni M V. The difference in findings may be due to inclusion of dependent and student category in our study. ^{4 8 9}

Conflict of Interest - Nil

Conclusion

The study found nearly half of the beneficiaries are utilizing ICDS services. This study also revealed significant association between various socio-demographic variables and utilization of ICDS services- religion, caste, nature of family, socio-economic status and occupation of beneficiary/guardian. This study shows that there is a relation between socio-demographic profile of beneficiary and service utilization of ICDS. Planning of IEC activities and BCC activities should be directed more in groups where participation is lacking.

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Determinants of Needlestick Injury at Coastal Karnataka, India

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Abstract

Background: Needlestick injuries are considered as the most commonly occurring occupational injuries amongst healthcare workers. Blood-borne infections can be transferred via needlestick injury. Healthcare workers may acquire these injuries in their day-to-day work from inappropriate procedures and low safety measures.

Materials and Methods: A prospective observational study was conducted at a tertiary care hospital in coastal Karnataka. The study involves a complete time-bound enumeration of needlestick injuries for the period of seven months starting from October 2018 to April 2019. A self-generated data collection form was used as a study tool, which was given to the healthcare worker who had experienced needlestick injuries.

Findings: Most of the injuries have occurred in wards (45.4%) and during invasive procedures (52.3%). The majority of the injuries were occurring in the morning shift time (38.6%). The majority of study participants (52.3%) were working for 45 to 59 hours per week. Amongst the study participants, most of them were having up to 2 years of work experience (68.2%). The injuries were occurring during invasive procedures, due to improper disposal of needles, while collecting the waste, and suturing.

Conclusion: The determinants of needlestick injuries were identified using the data. Continuous education and training programs on the safe handling of needles would help prevent needlestick injuries in the hospital.

Keywords: Needlestick injuries, infections, delivery of care, occupational health, standard precautions, healthcare worker

Introduction

Occupational health involves all features of health and well-being in the workstation and has a

solid emphasis on primary prevention of threats. The employee's place of work has several elements leading to various diseases.¹ Especially in hospitals, job-related health, and safety hazards are more. It is familiar with healthcare workers (HCWs) to get infections by a patient during direct patient care. Because the health care worker spends his entire work shift on patient care activities. Needlestick injury (NSI) is an unintended percutaneous penetrating wound triggered as a result of a contaminated needle of a syringe and sharps, through which the infections get transmitted through blood. NSIs are considered as the most commonly occurring

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occupational injuries amongst healthcare workers.²

Blood-borne infections like acquired immune deficiency syndrome (AIDS), hepatitis B, and hepatitis C can be transferred via needlestick injury. Every year, millions of HCWs have the threat of acquiring blood-borne illnesses in their workplaces because of needlestick injuries.³ The most important actions initiating needlestick injuries are administering injections, blood collection for laboratory investigations, recapping the needles, improper handling or disposal of needles, collection and segregation of waste, and when moving blood or other body fluid to a sample bottle using a syringe.⁴ The hazard level varies based on the occupation and working unit. Among HCWs nurses are most commonly experiencing NSIs because they are engaged in patient care activities like administering injections and insertion of intravenous lines for infusions.⁵

The World Health Organization (WHO) estimated that worldwide needle stick injury is 2 million per year. Out of that 37.6 percent of HCWs are having hepatitis B, 39 percent of them have hepatitis C and 4.4 percent of them have human immunodeficiency virus (HIV) infections through needlestick injuries.⁶ The major risk factors for NSIs among HCWs are age, educational status, working unit, work experience, and workload. NSIs were seen mostly during injection administration, recapping, and disposing of the needles or sharps.^{7, 8} This study attempts to explore the determinants of NSIs and recommending preventing measures.

Objectives of the Study

1. To identify the prevalence of needlestick injury among the healthcare workers
2. To explore the determinants of needlestick injury

Materials and Methods

Study Design: Prospective observational study

Study Setting: The study was conducted at a tertiary care hospital in coastal Karnataka.

Study Population: The study involves healthcare personnel like doctors, nurses, technicians, class-4 workers or housekeeping staffs, interns, and students with needlestick injuries reporting to the Hospital

Infection Control Committee (HICC) and Safety & Sentinel Committee of that hospital during the period from October 2018 to April 2019. The details of the healthcare worker will be obtained through the register maintained by the Hospital Infection Control Committee.

Exclusion criteria: Healthcare workers denying to give consent for participation.

Sample size: Complete time-bound enumeration of needle stick injuries. During the study period, 44 HCWs had NSI

Study tool: A self-generated data collection form was used to collect the data.

Data Collection: The researcher approached the infection control nurse (ICN) to collect the information of HCW who had experienced NSI. Because ICN is an authorized person to capture the data from each department of the hospital. The data collection form was provided to the study participants within 24 hours after reporting to casualty.

Data Analysis: Data was entered in Microsoft Excel 2013. Descriptive statistics were expressed as frequencies and percentages. Root cause analysis (cause and effect diagram) and failure modes and effects analysis (FMEA) were done using the software Minitab 17.

Ethical Considerations: Ethical clearance for the study was obtained from the Institutional Ethical Committee (624/2018). Participation in the study was voluntary. After obtaining the ethical clearance from the concerned authority, the written consent of all participants in the local language was obtained before providing the data collection form. The participants were educated about the determination and procedures of the study by providing a participant information sheet.

Results

As a whole, 44 healthcare workers were included in the study. None of them refused to participate. This shows a response rate of 100%. Most of them were females (66%; n=29) amongst the study participants. The age of the study participants ranged in the middle of 18 and 52 years, the mean age is 27.6 years. NSI was highest amongst the HCWs from 23 to 27 years of

age (36.4%; n=16), followed by 18 to 22 years (31.8%; n=14), 28 to 32 years & 33-37 years (9.1%; n=4 each), 38 to 42 years (4.5%; n=2), 43 to 47 years (4.5%; n=2), and 48 to 52 years (4.5%; n=2).

Out of 44 participants, NSI was highest among the interns and students (22.7%; n=10), followed by Staff nurses (18.2%; n=8), housekeeping staffs (16%; n=7), junior residents and technicians (6.8%; n=3) then registrars (4.5%; n=2), and senior resident (2.2%; n=1). Most of the NSIs have occurred in wards (45.4%; n=20), followed by intensive care unit (20.4%; n=9), casualty (13.6%; n=4), operation theatre (9.1%; n=4), outpatient department (6.8%; n=3) and dialysis (4.5%; n=2). The majority of the NSIs were occurring in the morning shift time (38.6%; n=17), followed by night shift (27.3%; n=12), evening shift (15.9%; n=7), afternoon shift (6.8%; n=3), general shift (4.5%; n=2), general OPD timings (2.3%; n=1), and on-call duty hours (2.3%; n=1).

NSIs were found to be highest in April (n=10), followed by February (n=8), October (n=7), November (n=6), January (n=5), December (n=4), and March (n=4). Most of the study participants had NSIs during invasive procedures (52.3 %; n=23), followed by disposal (36.3%; n=16), post procedure (4.5%; n=2), accidental prick (4.5%; n=2), and recapping (2.3%; n=1). The majority of study participants were working for 45 to 59 hours per week (52.3%; n=23), followed by 30 to 44 hours (22.7%; n=10), 75 to 89 hours (11.3%; n=5), 60 to 74 hours and non-specific duty hours (4.5%; n=2), 0 to 14 hours (2.3%; n=1) and 15 to 29 hours (2.3%; n=1). Amongst the study participants majority were having up to 2 years of work experience (68.2%; n=30), followed by 3 to 5 years (18.2%; n= 8), 9 to 11 years (6.8%; n=3), 6 to 8 years (2.2%; n=1), 12 to 14 years (2.2%; n=1), and 15 to 17 years (2.2%; n=1).

Table 1: Awareness of study participants about needlestick injuries

Sl. No.	Study variables	Yes (n%)
1.	Awareness on “Universal Precautions”	44 (100%)
2.	Attended educational on NSI since past one year	35 (80%)
3.	NSI protocol is displayed at the worksite	43 (98%)
4.	Proper storage of needles at the worksite	44 (100%)
5.	Adequate number of protective equipment is available at the worksite	44 (100%)
6.	Awareness of biomedical waste disposal guidelines of the hospital	43 (98%)
7.	Trained on the use of safe devices since past one year	35 (80%)
8.	Awareness of exposure control plan	39 (89%)
9.	Awareness on the procedure to follow post-NSI	41 (93%)
10.	Provision of safe devices for each procedure requiring a sharp requirement	42 (95%)

The determinants of NSIs were identified using the data obtained from the participants and they are listed below. Root cause analysis (RCA) was performed to determine the root cause of the problem. The root causes

of needlestick injuries were: Invasive procedures; improper disposal of needles; while collecting the waste, and suturing.

Determinants of needlestick injury

- Long working hours
- Lengthy procedures
- Understaffing
- Overfilled sharp container
- Negligence
- Hurry in work
- Non-cooperative patients
- Not following the standard protocol
- Lack of sleep
- Accidental prick
- Talking during procedure
- Lack of safety devices
- Recapping
- Improper handling of needles
- Improper disposal of needles
- Suturing
- Invasive procedures
- Workload
- Lack of training

Failure modes and effects analysis (FMEA) is a bit by bit process to identify all potential causes in the process. A fault that disturbs the consumer or the system is termed as failure modes. FMEA aims to take appropriate actions as well as to eliminate the failures.

Here, the researcher is focusing on the prevention of needlestick injury. To prevent NSI, the root causes were studied depending on the severity of the problem. Based on this, HICC recommended certain measures to prevent NSI. They were: Continuous monitoring of the HCWs, continuous education on the safe handling of needles, and routine training programs for all the HCWs.

Discussion

Nurses are considered as the most vulnerable group amongst the HCWs. Since nurses are accountable for administering injections and intravenous fluids.^{4, 7} Students and younger employees are more likely to commit mistakes as they have less working practice.⁹ Therefore many occupational hazards were seen among them. A similar study has recognized the major association between age and work experience. Therefore these factors are considered as the chief cause for the NSI.¹⁰ Various studies have shown that educational status is also a causal factor of NSI. Training programs on NSI prevention is very essential for students. Because lack of training is the most significant causative factor of NSI.⁹ The head of the department of all the units in the hospital must ensure that the HCW engaged in patient care activities must attend those classes regularly.

Wards are the most familiar place where NSIs are more. Many patients will be occupied in wards with less staff (more workload). Even though they were aware of the guidelines, the NSIs were occurring due to improper disposal. This may be because of negligence, hurry in work, overloaded with work, unavailability of sharps disposing containers at their workplaces. Several studies have also discussed similar outcomes.^{7, 11} Mostly the ward staff will assign some procedures like checking blood sugar and connecting intravenous infusion to students or interns who are posted there. But the students are not been supervised by the ward staff while performing procedures. There should be strict monitoring of all HCWs by the infection control team. And strict actions should be taken if the wrong practices are being followed.

More number of injuries were taking place during the procedures like checking blood sugar (GRBS), taking a blood sample for laboratory investigations or arterial blood gas (ABG) analysis, suturing, connecting intravenous infusion, inserting an arterial or intravenous line. Many other studies have found that NSIs are common during invasive procedures and nursing activities.^{12, 13} The morning shift is considered a busy schedule. Since most of the procedures like administering injections, collecting a blood sample, checking blood sugar after food, etc. are taken place during morning hours.^{7, 14} Not many studies are done related to the work shift and

NSI. NSIs can be reduced by using retractable lancets for checking blood sugar. This study proved that there was not even a single injury after implementing this particular tool.^{15, 16}

Working hour is another important cause leading to NSI. Long working hours lead to more hazards. This study suggested that HCWs working more than 40 hours are in the risk group.^{7, 17} In this hospital, students will have their internship in April. As they are not well trained and prone to commit mistakes. This can be managed by assigning the students or interns under experienced staff. The participants have listed a few preventive measures. They are: To prevent these injuries staff should attend the training session on the safe handling of needles and the core staff like doctors and nurses should do the procedure cautiously, avoid talking to others while using needles, or doing invasive procedures.

Based on the findings of the study, the researchers recommended that education and training of all HCWs on universal precautions, safe handling, and disposal of needles & sharps help to prevent NSIs. Continuous assessment of all HCWs must be taken by the infection control nurses to evaluate the standard practices being followed in the hospital. The staff should have resting hours in between the night shift to avoid errors caused due to lack of sleep. Self-retractable lancets should be implemented to prevent NSIs.

Limitations

This study cannot be generalized because the study had a very less number of participants. The study duration was less and included only those HCWs who had experienced NSIs. The study would explain better outcomes if done for a longer duration and included HCWs with no NSIs from the same department. This might be helpful to discover the unexplored causes for the NSIs and develop preventive measures.

Conclusion

Needlestick injuries are of greater risk to HCWs as they transmit blood-borne pathogens due to unintentional exposure to infected blood and body fluids. HCWs had poor risk alertness, less awareness about the benefits of following standard procedures. Therefore, all HCWs must be trained to follow a standard protocol that is

developed by the hospital infection control committee to prevent NSIs in their workplaces.

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An Initiative for Management of Food Waste: An Observational Study

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Abstract

Introduction: Food waste management is a process through which wastage of food can be prevented. The methods through which waste can be managed includes source reduction and reuse, animal feeding, recycling etc. Various initiatives are started by the organizations to reduce the food wastage. Similarly, an initiative named “Save food, share food and Share joy” was started by FSSAI. The initiative aims to bridge the gap between the food companies, surplus food agencies and beneficiaries. **Objectives:** The objective of the study was to observe the distribution of leftover food by different NGOs among less fortunate people. **Method:** Various organization were approached to understand food distribution pattern followed by the organizations in Delhi, NCR. **Result:** The study revealed that large amount of leftover food was distributed and definitely act as a food waste management strategy and an initiative to promote no hunger in Delhi and NCR.

Key words: Food waste management, food distribution, leftover food, initiatives, surplus food.

Introduction

Food is an eatable substance which is consumed by the living organisms to fulfill their nutritional requirements. It can be either of plant or animal origin containing all the essential macronutrients and micronutrients. About one-third and one half of the food produced is wasted globally. Food can be edible as well as inedible. Edible food is fit for the human consumption and thus its wastage can be reduced whereas inedible waste are the unavoidable wastes [1]. There are two different terms-Food Loss and Food Waste. Loss of the food occur during the production, transportation, post-harvest techniques whereas wastage of food occur when eatable food items get deteriorates because of loss of supply chains from production to consumption. Unavailability of food or food loss might be resulting into high risk of nutrition related problems as 925 million people globally fall into under-nutrition category

[2]. In today’s scenario, reducing wastage of food is a key challenge. Some of the measures must be taken by the people of our country regarding the wastage of food by improving transportation facility, advanced storage facilities, improved food processing methods etc. as this will help in decreasing the rate of food wastage in India. There are many governmental and non-governmental initiatives (by building organizations) around the country who primarily aim to save and redistribute the food among the one who is in need of it [3].

Indian Food Sharing Alliance (IFSA) has been formed by Food Safety and Standards Authority of India (FSSAI). Its aim is to help and solve India’s food wastage and hunger crisis by developing the link among various food partner organization, food recovery agencies and NGOs [4]. An initiative named “Save Food, Share Food and Share Joy” has been started by IFSA which primarily aims to prevent the wastage of food which is being wasted or lost by distributing them among the needy people through the chain of contributors of the community. Many food recovery organizations are working under this initiative in different states of

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India. Therefore, the objective of the present study was to understand the process of distribution of food by different organizations in Delhi, NCR.

Material and Methods

Various organization were approached to understand food distribution pattern followed by the organizations in Delhi, NCR. Among all the different organizations, ROBIN HOOD ARMY (RHA) and FEEDING INDIA was playing the major role in distribution. They were approached and permission was taken to conduct this study. Both the organizations were observed for 2 months. Their structure, working process, people working for same cause were observed in various drives. More than 10 drives per organisations were observed for their hygienic practices, distribution pattern, rules and guidelines followed every drive.

Results

The study revealed that the organisation called Robin Hood Army (RHA) was established in August 26, 2014 by Neel Ghose, Anand Sinha, Aarushi Batra with a motto "Serve the Hunger Citizen". This is a zero-funds based organization that mainly focus to get excess amount of food from the community and nearby areas to distribute and serve them to less fortunate people. All the volunteers are named as "Robins" who work together for a social cause. This organization consists of over more than 55620 volunteers (approximately) in over 180 cities. The main aim is to beat the global hunger. They basically tie up with restaurants and other donators from where they collect a good amount of food and distribute them to large number of homeless/ unfortunate people [5].

Feeding India came in year 2014 led by founder Ankit Kawatra and Srishti Jain. It is a non-profit based organization having the collaboration with Zomato. Its main aim is to work on solving the complex challenges related to wastage of food, hunger and malnutrition in India. Some of their key partners are- Zomato, Sodexo, Tupperware etc.

They primarily focus on 5 key programmes- Magic wheels- Hygienic vans who collect surplus food from various sources and distribute among the people in need, Happy fridge - Volunteers leave food in the

refrigerator and whosoever is in need of food can easily access the food from these refrigerators, Hunger heroes - Approximately over 26,000+ volunteers are there across 100+ cities who helps in distributing food to the needy ones, Poshan to pathshala - Program focusing on providing food in schools as an incentive for education, Emergency relief - Program focusing on providing food, shelter, water and other basic amenities to those who are the actual sufferers in the natural/man made calamities [6].

The RHA (Faridabad) is broadly consist of two groups- (a) East RHA (b) West RHA of Faridabad. The Feeding India (Delhi) consist of different groups of volunteers covering different zones of Delhi.

OBSERVATIONS REGARDING THE FOOD DISTRIBUTION

A set of points were observed regarding the distribution practices (how, when, where the food is being collected and distributed) by attending 10 drives organised by the organizations. The number of drives per day totally depends on the amount of the food they receive. There are different groups of volunteers which take care of pre-defined areas of distribution. There was no hierarchy system in the Robin Hood Army Organization and all the volunteers are treated as same. But in Feeding India, volunteers are designated with different posts responsible for different activities. While distribution the small kids get fascinated by the food items like pastries, patties or any other bakery items. The duration of each drive depends on the amount of food received and even the late-night drives were done. After the completion of each drive they have to count an approx. value of number of people they fed and have to report to the higher authority for the record. Even if the food is not available, the group of volunteers contribute among themselves and let the drive done. If the people don't have the utensils to take food, they also provide disposable crockery to them. Although, there was no proper follow up of hygiene practices as such.

Discussion

Great initiative was taken by Robin Hood Army (RHA) and Feeding India. The system is transparent. They provide joy to the people and promote "NO HUNGER". But the hygiene practices have to be

standardized while distribution.

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Conceptual Framework on Effects of Music in Polycystic Ovary Syndrome of A Case

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Abstract

Music is a source of pleasure and creativity. In the present work an attempt to relate musical experiences with sexual suggestiveness has made in the clinical population (PCOS). The subject's personality along case history has been assessed. It is a single case research design (n=1, a female unmarried case of 32 years). 11 songs (including a background music) were judged by the subject to determine the level of suggestiveness. The songs were evaluated by the researchers (one male and one female) to know suitability of the parameters fixed in this study. Inductive analysis for creative synthesis was maintained to discover patterns in sexual behavior of the subject. Results were analyzed and discussed. Importance of mirror neurons and masturbatory guilt has been stated. Subject's behavioral changes were analyzed by researchers through online media (interface). Non pharmacological application has been emphasized to heal the patient with PCOS, a medical condition. This is a six month long pilot study. A patient oriented affordable management plan has remained the focus of the study.

Key Words: *PCOS, Sexual Suggestiveness, Single Case Research Design.*

Introduction

Music is an organized set of sounds consisting beats, melody and words. Experiencing music involves our perceptual capacity, creative capacity, and response tendency based on biochemical capacity. Music has psychological and non-psychological aspects. Music is characterized by melody, harmony, tonality, rhythm, meter and form. From psychological point of view, music is an unlearned tendency commonly known as archetype. It is our life instinct or shadow. Music thus, identifies with Anima (the female nature in men) and Animus (the male nature in women) unconsciously. Possibly these two phenomena have thought and emotion as base elements. Libido is expressed in particular by music singing or listening. We sublimate or accept rejected needs through musical experience. Music touches our unconscious layers of brain. Socially unaccepted sexual urges are expressed through music listening or singing. Roles of instincts are noted in music production. Instinct is recurring actions and reactions. So music helps to release our hunger need, sexual need and creative needs that require repeated satisfaction. Music singing or playing is used as a behavior to bring sexual suggestiveness in a social situation. Through music an undertone is given for stimulating sexual arousal. Sexually suggestive

behaviors depend on menstrual cycles, voice pitch and activity level in individuals. Music listening, ovulating phenomenon and sexually suggestive cues as undertone for arousal are associated altogether to give an erotic aspect in human gestures. Sexually suggestive signs indicate sexual maturity. Thus, it is considered by this research that music maximizes reproductive success and survival in human beings.

Music practice is done during morning. The environmental calmness positively affects the vocal cord during the morning. After sleep, the parasympathetic nervous system reaches its active form. Music carries the positive effects of this system for the rest of the day. Singing in morning raises sexually self suggestive behavior and chances of reproduction due to balanced hormonal activity. Music listening and singing releases hormones namely Dopamine, Prolactin and Oxytocin. During masturbation (alike sex or mating) levels of Dopamine also rises. Dopamine secretion is less in amount in case of depression and anxiety related disorders. Presence of a partner improves the biological changes of females in a musical environment. Musical behavior depends prominently on our imitating capacities. This copying mechanism is supported by

central and peripheral nervous system as well. Brain consists of mirror neurons in Premotor Cortex, Primary Somatosensory Cortex, Inferior Parietal Cortex, and Supplementary Motor areas. The mirror neurons form the Mirror Neuron System which plays a combination of various functions namely social cognition, language, empathy and social communications¹. The auditory system consists of the receptors in the human ear, the auditory nerve and the temporal lobe of the cerebral cortex. Music is a creative process. Creativity largely depends upon creative thinking which involves preparation, incubation, illumination, verification and elaboration². Modern Psychologists state that fantasies are creative only when they come up as products. This aspect has been considered in this paper as well. In this connection artistic personality needs to be included for elaborating the research purpose. Artistic personality starts to develop from early in life. Surroundings and persons in close contact stimulate this pattern in behavior. It reflects emotionality, sensitiveness, independence, impulsivity, socially withdrawn, introversion and non conformity³. Human sexual behavior and singing is both creative in nature. Human sexual activity implies bonding and has components of emotions just the same way music has. There is an intimate connection between vocalization and sexual activity. Copulatory vocalization occurs during sexual mating. It is a kind of voice production by females to build intimacy. Another sound is mating Call which is an auditory signal to call mates found in both male and females. In women, the Vagus nerve connects vagina and throat and affirms the vocal vaginal correlation hypothesis. Acoustic stimulation is suitable to regularize menstrual cycle as per the present research.

In one important study relation was noted among emotional responses and music⁴. Several mechanisms were emphasized namely. (1) brain stem reflexes, (2) evaluative conditioning, (3) emotional contagion, (4) visual imagery, (5) episodic memory, and (6) musical expectancy. Moreover, implications of attention in Sexual Arousal was noted which opened up the way to deal Sexual Dysfunction⁵. In a recent study, focus was on Misattribution of musical arousal for sexual attraction towards opposite-sex faces in females⁶. From the mixed sample, only women who had listened music gave significantly emphasis on facial attractiveness and dating desirability. It was not found in the silent control condition. High-arousing as well as complex music could contribute in the results. In another study

music listening was found to play a significant role in cognitive recovery and mood in patients of middle cerebral artery stroke⁷. Results revealed changes for verbal memory and focused attention in these patients. They were found in less depressed and less confused mood due to music. The music listening habit for preventing negative mood has been proved by these authors. The neural mechanisms were found contributory systems. The study showed a possibility of a presence of a suitable sound environment which contributes effectively in recovery from neural damage in human beings. In another significant research a relation was discovered between music and vocabulary⁸.

PCOS is Polycystic Ovary Syndrome found in women causing hormonal imbalance and problems in child birth. Irregular menstruation is developed by this medical condition. These female patients experience reproductive, metabolic, psychological and dermatological complications⁹. The condition is of a lifelong nature. From puberty to menopause it extends. The diagnosis is mainly medical. It is termed as an endocrinal disorder and now a days roles of Endocrinologists are found to be more apt than the Gynaecologists. It has a multifactorial etiology with combined effects of genetic and environmental factors. An excess production of androgen is the commonest feature of PCOS. The recent diagnostic criteria includes two features among the three namely Hyperandrogenism, Ovulatory Dysfunction, and Polycystic Ovarian Morphology in terms of 12 follicles of 2-9mm size in each ovary with volume of 10ml¹⁰. This illness is a reason of headache in young women. It has quite long lasting clinical manifestations as the Hypothalamic Pituitary Axis gets affected. Indeed, women start fearing heterosexual relationships and child bearing process.

Method

The present study is qualitative in approach.

- (a). song analysis by researchers
- (b). case analysis by researchers (or Clinicians)
- (c) Subject's own evaluation

Inductive analysis with creative synthesis has followed.

Objectives

To determine the creativity level in young adults

having sexual underachievement due to clinical condition PCOS.

Design

Single-case research design is context sensitive and shows individual differences. The subject serves the own control. Continuous assessment is done. In this assessment, the behavior of the individual is observed repeatedly over the course of the intervention. It involves two methods

Baseline assessment: the researcher has to look for behavioral trends.

Variability in data: Because behavior is assessed repeatedly, the single-subject design allows the researcher to see how consistently the treatment changes behavior over time.

Tools

1. Songs and background music in Indian and Western style were chosen
2. NEO FFI
3. Case History Form

Neo five factor inventory. The form S was taken. The authors of this inventory are Paul T. Costa, Jr, and Robert R. McCrae. The year of publication is 1991. It consists of five scales of 12 item. The domains are neuroticism, extraversion, openness to experience, agreeableness and conscientiousness.

Criteria for sample selection

- Songs sung in suppressed erotic connotation as subliminal stimulation
- Drumming present
- Songs sung in low to high through medium pitch
- Age and gender of singers along their secondary sexual characteristics (with or without mustache and beard, long and short hair) were evaluated by researchers to judge appropriateness to excite mildly the subject.
- Presence of sex noises and sex sounds in suppressed form
- Presentation of songs was from low exciting to highly exciting then reverse mode for six months

duration

- The subject was a female unmarried woman of 32 years under medical consultations. Individual consent was taken.
- The researchers were carefully matched for mood and musical preferences for rating the songs.
- Researchers and subject listened the songs, watched music video if available, watched the music posters.
- Listening was maintained on a recurring manner. Feelings, which come for actual human presence (real life partners), were redirected and generated by musical stimulations by a method of classical conditioning. Further, when the subject was listening the music, researchers (male and female) remain present online to provide the support as psychosexual figures. The subject indicated the specific music listening to the researchers.

Sample

Sampling Frame consists of 30 songs.

Final Sample 11 songs (drawn from sampling frame based on qualitative rating, Thurstone's Scale and mode values for the present subject)

- 1 .Ricky Martin - The Touch¹¹
- 2 Ricky Martin she bangs
- 3 Ricky Martin Mas
- 4 Ricky Martin Nada
- 5 Rihanna - We Found Love ft. Calvin Harris
- 6 Demi Lovato - Let It Go
- 7 . Sunidhi Chauhan sajna ve sajna
- 8 Alka Yagnik : Mehendi
- 9 surjo rongeen anupam roy
- 10 Justin Bieber – Baby¹²
- 11 James Bond Car chasing Spectre

Result and Discussion

Assessment of music in final sample was done by researchers. Each musical material has been assessed by two researchers in six domains. These are general

psychological aspect, sexual suggestiveness indicating trait, general feature in terms of pitch, biological feature such as voice type (arousing or calming). Other aspects are prominent instrument played and singer's personality. A consensus in judgment was incorporated. The general psychological aspects consisted of several important domains namely existential anxiety, need for self esteem, belongingness need. Songs were judged to have traits on sexual suggestiveness namely moving toward people, need for power and need for affiliation. Biological aspects identified are mild, moderate and high on masculine nature.

Another focused analysis of final study sample has been done. The analysis of music pieces in final study reveals three components. The core theme emerged is freedom while subject denoted them as having self expression. The researchers explained them as arousing. Here, frequency of judgments is considered.

Analysis of state of human subject (N=1) was done. Upon analyzing the condition of the human subject significant aspects emerged in the study. The pre music test cum therapy behavior includes depression, loneliness, low arousal, low masturbation. The post music test and therapy behaviors become vocabulary increase, improvement in creative expression, and different image selection. Positive result found through qualitative assessment of social media posts (profile picture, on time) and cheerful voice. Pre marital sexual life history was found to be enhanced, reported by regularized occurrence of self masturbation and menstrual cycle.

Case history of the subject reveals presence of PCOS with associated metabolic disorder (diagnosed by a trained and well qualified Physician). Significant medical features comprise of menstrual irregularities, hirsutism, thyroid dysfunction, and hypertension. She is under specific allopathic medication (protocol unrevealed).

The Personality assessment was done with the help of NEO FFI that showed significant shifts in results. During pre music test, scores were 28 in Neuroticism, 30 in extraversion, openness domain contains 24 score. Agreeableness domain contains 20 score and finally Conscientiousness domain reveals 30 score. Upon retesting with the same test material, during post music application scores were found different. Now the scores are 26(N), 35(E), 33(O), 32(A), and 23(C).

The present paper is based on main premises namely emergence of interpersonal need, identification of social cues and acquiring creative image. The songs reflect the following aspects.

1. Extremely high pitch (painful) singing with affirmative words is sung to alter negative thoughts.
2. Fast beat is used for opposing anxiety.
3. Voice in feminine and firm quality creates more arousal of positive thoughts.
4. Voice throw/stroke at high pitch is used for releasing tension
5. Drumming is used to combat anxiety.
6. Fear is expressed in low pitch
7. Difficult word sung in low pitch
8. Whispering voice making to provide silent cues
9. Wolf sound making and breaking of wolf sound at high pitch

Analysis of music videos of songs reveals important aspects for suggestiveness. These are darkness that stimulates the listener, open doors, seated position, and freedom that has expressed in body movements. Analysis of personal life of singers namely Ricky Martin, Taylor Swift, Demi Lovato, Justin Bieber, Sunidhi Chouhan, Alka Yagnik suggest projection of personal life in the music they created. The unresolved and unconsciously nurtured important needs are expressed through their voice and in presentation of lyrics.

The music selected for the present research has created subliminal stimulation in the subject. The thoughts, actions and feelings have been altered in the subject by the unaware and vague cues. A kind of conditioned response has been produced. The concepts such as D Love (deficiency need) and B Love (Being need) have been reflected in the responses of the subject. The lack of receiving of love (D Love) restricts the giving of love (B Love). Basic lower order needs namely biological need and safety needs are less gratified that create boundaries in achieving love and belongingness need in the subject. The result of case history analysis and personality test result (NEO5) further support this. Musical stimulation alters the mind of the subject in a positive direction. Subject's focus on aesthetic needs was redirected from materialistic needs. An atmosphere

of love created in imagination which motivated the subject. Music has given a sense of protection and a psychological concept of inside a ring (circle) in the thoughts of the subject. Masturbatory practice supports successful implication of music with subtle erotic sense in her. It actually diminishes sadistic sense and provides warmth and support. Music listening produces mild body movements which further help to develop mature sexual gestures. All the singers included in this research are psychologically retaining childlike innocence in their voice. This trait produced happiness in the behavior of the subject. Music produced mirror neuron activation and further strengthens the act of moving toward people for social bonding. Music actually helps her animus qualities to be expressed in reality along a guided imagination. The preliminary selection of music was done by the researchers based on her case history. The subject could able to reciprocate in revealing her experience as per the research plan. Raised scores in the areas such as extraversion and openness to experiences on personality assessment shows significant behavioral improvement after music listening.

Conclusion

The present research links aesthetic needs with biological domains. Because of the specific medical conditions, subject's spontaneous response to environmental stimuli delays. The association among cells fails to function in individuals. Through creativity training this delay could be handled. An appropriate level of biochemical elements namely hormones are required for sexual maturity. Music can promote sexual development for sexual maturity irrespective of chronological age. It has been assumed that making responses therapeutically for the sexual attractions is healthy and socially beneficial. However, it is the voice rather face that promotes heterosexuality.

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Serum Zinc Levels in Hospitalized Children with ARI aged 2 Months to 5 years: Association with Socioeconomic and Nutritional Status in a Tertiary Care Centre

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Abstract

Background: Acute respiratory infection (ARI) is a global health problem in children. Zinc stimulates immune responses and prevents infection. Multiple risk factors like low socioeconomic status and malnutrition are associated to be attributable to ARI. Aim of the study was to study the serum zinc levels in ARI children and its association with socioeconomic and nutritional status.

Material and Methods: Serum Zinc levels in 100 hospitalized children with ARI were assessed and its association with socioeconomic and nutritional status was made out.

Results: Mean serum zinc levels in 60% of ARI children were below normal. Mean serum zinc levels was 70.27 25.33 g/dL. Serum zinc levels were statistically low in ARI children of low socioeconomic status (P-value <0.04) and malnourished (P-value <0.05) children.

Conclusion: Serum zinc levels in children with ARI with low socioeconomic status and malnutrition were found to be low.

Key Words: ARI, Serum Zinc Level, Socioeconomic status, Malnutrition.

Introduction

Acute respiratory infection (ARI) is a global health problem in children.¹ An estimated 4 to 5 million children die from ARI every year in developing countries.² Multiple risk factors such as socioeconomic status, malnutrition, poverty, lack of awareness have been reported to be attributable to ARI morbidity.^{3,4} Zinc is a trace mineral and has a fundamental role in gene expression, cell development, and replication.⁵ Zinc is critical for the functioning of the biomembranes. Zinc protects from oxidative damage by competing for binding sites with redox metals. Zinc has both acute and

chronic antioxidant action. Zinc deficiency increasing the inflammatory pathology in the respiratory tract with increasing damage to the cells is a proposed mechanism.⁶

There are no body stores for Zinc, thus bioavailable Zinc from food or supplement must supply zinc regularly.⁷ The global prevalence of Zinc deficiency is approximately 17% and rates of deficiency approach 73% in some low to middle-income countries.⁸ Zinc deficiency is prevalent in developing countries either due to poor intake of zinc-rich food or due to the presence of phytates in food substances which decrease the absorption of zinc.⁹ The aim of the study was to estimate the serum zinc levels in hospitalized children with ARI age 2 months to 5 years and its association with socioeconomic and nutritional status.

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Material and Methods

100 Hospitalized children with ARI aged 2 months to 5 years admitted in the Department of Pediatrics at

Maharishi Markandeshwar Institute of Medical Sciences and Research, Mullana (Ambala) were enrolled in the study. This was an observational and prospective study done in 1 ½ years.

Inclusion criteria:

- Admitted children with age 2 months to 5 years suffering from ARI and of either sex.

Exclusion criteria:

- Patients with known Zinc Supplementation
- Patients who were suffering from chronic infection like pulmonary tuberculosis
- Children whose parents did not gave consent for study

Method: Serum Zinc Level estimation was done by colorimetric zinc kit using ERBA chem semi-auto

analyser. Proforma was duly filled by taking history about profession, Income, Living standards, Housing of the family.

Statistical Analysis

- During data collection, complete proforma was regularly checked to rectify any discrepancy, logical error or missing information.

- All statistical methods were performed through SPSS for windows version 25, the P-value < 0.05 was considered statistically significant. Microsoft word and excel was used to generate Graphs and Tables.

Results

Serum zinc levels between 60 g/dL – 120 g/dL were considered to be normal.

Table 1: Socio-Demographic Profile of Children with ARI

Variables	Characteristics	Percentage
Age distribution (Mean age 26.35± 17.36)	<12 months	26%
	>12 months	74%
Socioeconomic status (Modified Kuppaswamy socioeconomic statue scale)	Upper class	9%
	Upper Middle	21%
	Lower Middle	22%
	Upper lower	9%
	Lower	39%
Malnutrition Status (WHO criteria)	Absent	64%
	Present	36%

The majority of patients (74%) were > 12 months of age. The mean age was 26.35± 17.36 months. 48% of patients belonged to low socioeconomic status. Malnutrition was present in 36% patients.

Table 2: Distribution of patients according to Serum Zinc levels

Percentage of patients	Serum Zinc Levels	
	<59.99 g/dL	>60 g/dL
Total (100%)	60%	40%
Mean Serum zinc level: 70.27± 25.23 g/dL		

60% of patients suffering from ARI had a low serum zinc level. Mean Serum zinc level was 70.27± 25.23 g/dL.

Table 3: Socioeconomic status wise comparison of Serum Zinc Levels in ARI children.

Socioeconomic status	Zinc level (Mean value) g/dL	P value
Upper class	83.7 ± 27	<0.04
Upper Middle	74.5 ± 25	
lower middle	76.2 ± 30	
Upper Lower	54.1 ± 5	
Lower	65.2 ± 21	
Mean serum zinc level 70.2± 25 g/dL		

Serum zinc levels were statistically low (P-value <0.04) in low socioeconomic status.

Table 4: Comparison of Serum Zinc levels with or without Malnutrition

Malnutrition	Serum Zinc levels (Mean zinc level g/dL)	P-Value
No Malnutrition	77.1 ± 28.7	<0.05
Malnutrition	58.17 ± 9.05	

Serum zinc levels were statistically low P <0.05 in patients having malnutrition

Discussion

Serum zinc levels in 100 hospitalized ARI children aged 2 months to 5 years was estimated. The mean age was 26.35 ± 17.36 months. The mean serum zinc level was 70.27 ± 25.23 g/dL. 60% of ARI children had serum zinc levels below normal (Normal serum zinc level is 60-120 g/dL). In our study, the majority of the patients belonged to lower socioeconomic status (48%), only 9% belonged to the upper class. ARI was prevalent among lower socioeconomic status because of less awareness about cleanliness and their inability to afford proper

water, sanitation, and hygiene facilities. This socio-demographic data was comparable to study conducted by Fathima M. et.al (2017)¹⁰ Hussain A. M.et.al (2016)¹¹ and Savitha M.R el al (2007)¹² Our study is in contrast to Madhav S. M. et.al. (1990)¹³ and Monto A.S. et.al. (1974)¹⁴ who reported high incidence of ARI in higher socioeconomic status. The reason could be due to the early detection of ARI in economically well families. In our study malnutrition was present in 36% of patients. Same was observed by Panneersalem R et.al. (2016)⁶ and Kumar et al. (2004)¹⁵

In our study, mean serum zinc levels in upper class were 83.7 ± 27 g/dL, upper-middle-class 74.4 ± 25 g/dL, lower middle class 76.2 ± 30 g/dL, upper lower class 54.1 ± 5 g/dL, and lower class 65.21 ± 21 g/dL. The serum zinc levels in the lower class were statistically lower (p -value < 0.04). The same was observed by the study done by Islam S.N. et.al. (2018)¹⁶. We observed serum zinc levels with no malnutrition were 77.1 ± 28.7 g/dL and with malnutrition 58.15 ± 9.05 g/dL. The serum zinc levels were statistically low in malnourished children (P -value < 0.05). Our study is comparable to the study of Hussain A. M. et.al. (2010)¹¹ and Thakur S. et.al. (2004)¹⁷ whose study showed malnutrition was associated with significantly lower levels of zinc.

Conclusion

Serum Zinc levels were found to be significantly low (P -value < 0.05) in ARI children with risk factors like low socioeconomic status and poor nutritional status. Extensive studies are needed on a larger basis to evaluate Serum Zinc levels in acute respiratory infections and consideration of the use of Zinc supplementation in children less than five years of age as prophylaxis especially in low socioeconomic status and malnourished children.

Funding- self

Conflict of Interest- Nil

Ethical clearance- Taken from Institutional Ethics Committee, Maharishi Markandeshwar (Deemed to be) University, Mullana, Ambala, Haryana.

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Osteoprotegerin, C- Reactive protein and Fibroblast Growth Factor-23 in Stage (II-IV) CKD Patients and Their potential for Increased incidence of Cardiovascular Disorders

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Abstract

CKD is a public health problem and many studies had support the link between kidney dysfunction and cardiovascular risk. Whilst, Osteoprotegerin (OPG), after its capacity to protect bone , also serum OPG in patients with chronic kidney disease (CKD could predict the deterioration of kidney function, cardiovascular, vascular events and all-cause mortality. On the other hand, fibroblast growth factors (FGFs), in patients with CKD, seem to increase progressively as kidney function worsens. Furthermore, renal insufficiency was independently associated with an increased level of C-reactive protein (CRP), which indicates a vital pathway mediating the increased cardiovascular risk in those patients.

Our aim is to study the correlations between Osteoprotegerin, CRP and fibroblast growth factor-23 serum levels in patients with chronic kidney disease stage (II-IV) and its possible relation with cardiovascular events.

The study enrolled fifty-nine patients with chronic kidney disease and according to CKD-EPI Creatinine/ 2009 equation were allocated as stage (II-IV), those patients were divided into three groups: Group1 (29 patients) with chronic kidney disease stage (II-IV) with cardiovascular events. Group2 (30 patients) with chronic kidney disease stage (II-IV) without cardiovascular event, to be compared with Group 3 (23 apparently healthy subjects .Serum obtained from their blood specimens to estimate; glucose, urea, creatinine, calcium, phosphate, sodium, potassium, aldosterone, FGF-23, Osteoprotegerin & C-reactive protein.

Data analysis shows that OPG levels is significantly higher in patients at stage III from that of controls ,as well as from those in stage IV-CKD patients, While CRP levels were significantly elevated in stage III CKD patients with values by about 300% greater than that of controls.

Keywords: Cardiovascular Disorders; CKD Patients; C- Reactive protein

Introduction

CKD is a public health problem , that results from decrease in renal function represented by GFR for a period of three months or more which is associated with severe cardiac outcomes and high mortality rate [1]. Data on mortality for CKD adjusted for comorbidity, race, gender, age and previous hospitality for CKD patients indicate an obvious decline in rates since 1995 may reflect to some extent the increased recognition of CKD as this confirmed by increasing number of patients carrying the diagnosis. [2]

Osteoprotegerin (OPG) is a glycoprotein, after its capacity to protect bone. It is produced in many tissues including lung, bone, kidney, vasculature, heart and placenta. [3] It was shown that serum OPG is elevated in patients with non-diabetic and diabetic chronic kidney disease (CKD). [4]

On the other hand, fibroblast growth factors (FGFs) that signal through FGF receptors (FGFRs) can regulate a wide range of biological functions, including cell proliferation, survival, migration, and differentiation. Among the signal pathways, RAS/MAP kinase is known to be predominant in the case of FGFs. [5] As

the central target organ of FGF-23 appears to be the kidney, where tubular phosphate reabsorption and 1-alpha-hydroxylase expression are suppressed. These features raised the question which role FGF-23 might play in dialysis patients (CKD stage V), the CKD stage where end-stage kidney failure is firmly established and neither substantial phosphaturic effect can occur. [6] By the time patients reach end-stage renal disease, where FGF-23 concentrations are often increased 100-to 1000-fold above the normal range, whereas serum phosphate concentrations are only modestly increased or even normal. [7] Whist, CRP is an acute phase reactant [8] that is found in plasma in trace amounts, its concentrations rises quickly and markedly with tissue inflammation. [9] In the large Cardiovascular Health Study, renal insufficiency was independently associated with an increased level of CRP, which may indicate a vital pathway mediating the increased cardiovascular risk in persons with kidney disease. [10]

Epidemiological data show documented associations between C-reactive protein (CRP), and cardiovascular disease in the general population. [11] Our aim was to assess the associations between CRP, Osteoprotegerin and fibroblast growth factor -23 with the incidence of cardiovascular disorders in CKD (stages II-IV) patients.

Subjects and Methods

This study was carried out at Baghdad teaching hospital at Baghdad Medical city, for the period from October 2017 to February 2018, which enrolled fifty-nine patients with chronic kidney disease from stage II-IV, under supervision of a specialized physician and the diagnosis was based on serum creatinine, according to CKD-EPI Creatinine/ 2009 equation [12]. Those patients were divided into three groups:

- Group1: 29 patients with chronic kidney disease stage (II-IV) with cardiovascular events.
- Group2: 30 patients with chronic kidney disease stage (II-IV) without cardiovascular event.
- Group 3: 23 apparently healthy subjects (age and sex matched to that of patients).

Subjects were enrolled in this study after excluding CKD patients with a chronic liver disease, or a thyroid disorder, or having a history of endocrinopathy, or patient on dialysis or had at least one session of dialysis. Baseline characteristics of subjects are illustrated in table

-1. The study was confirmed by The Local Research Ethics Committee and all subjects were provided with a written informed consent to participate in this study.

Analysis of serum creatinine, urea, calcium, phosphate and alkaline phosphatase were performed using the specific Flex[®] reagent cartridge /Dimension (RxL Max) / SIEMENS (USA). Whereas, human fibroblast growth factor-23 ELISA kit [13] and human osteoprotegerin ELISA Kit were purchased by Cusabio Biotech Co.,LTD (China) [14], while CRP we used turbilatex by Accent 200, Poland [15]. Statistical analysis of data is presented as means \pm SD. Significance was set at $p < 0.05$. Cases and controls were compared using either the t-test for independent samples, and Pearson's coefficient for correlations among normally distributed variables.

Results

According to serum Ca levels, patients with CKD were presented with significantly lowered values of serum Ca levels (table -1) Data analysis according to the presence or CV disorders in patients compared to that of controls showed that fasting serum glucose levels of CKD patients (with and without CV disorder) had significantly higher values as compared to the controls (76.5% and 29% respectively). Furthermore, patients with CV disease were even presented with greater fasting serum glucose as compared to those without CV disorder (Table -2). GFR values of CKD- patients were significantly lower than that of the control subjects considering both with and without CV disorders. Meanwhile, serum urea levels were significantly elevated as compared to the controls, irrespective to the presence or not of CV disease. But serum creatinine concentrations showed no significant variation between patients with CV disorder than those without CV disorder. Serum Aldosterone, FGF-23, OPG levels were presented with no significant variation among studied patient groups comparing patient with or without CV disorder (Table -2). Serum CRP levels were significantly elevated in stage III CKD patients with values by about 300% greater than that of controls (figure-1), but no difference between patients with or without cardiovascular events. While serum ALP levels is positively ($r=0.409$) correlated with serum CRP level at significant level of ($p=0.002$), but, serum CRP levels is negatively ($r=0.428$) correlated with serum calcium level in CKD patients at significant level of ($p=0.001$) in CKD patients [not shown]. While, serum FGF-23 levels

according to CKD stages (figure-2) showed no significantly variations among different CKD stages, nor from that of the control group.

Table (1) Basic Criteria for Participant in the study

Parameter	Group				P-value
	Patient(59)		Control(23)		
	Mean	SD	Mean	SD	
Age* (years)	60.54	12.49	50.70	16.21	P=0.013
Gender	37/22	-	17/6	-	P=0.337
Weight (Kg)	80.56	16.42	83.85	13.31	P=0.466
Height* (Meter)	167.33	5.94	171.75	7.84	P=0.033
BMI	28.66	5.18	28.37	3.72	P=0.835
FSG* (mg/dl)	157.50	68.49	99.83	23.54	P=0.005
Urea* (mg/dl)	72.52	29.25	28.70	9.54	P=0.005
Creatinine* (mg/dl)	1.98	1.81	0.66	0.16	P=0.001
GFR* (ml/min)	42.83	16.28	111.26	13.69	P=0.005
Hypertension*	26	-	-	-	P=0.015
Phosphate (mg/dl)	4.20	0.79	4.32	0.55	P=0.513
Calcium* (mg/dl)	8.64	1.03	9.31	0.52	P=0.005
Potassium	4.32	0.86	4.53	0.75	P=0.231
Sodium	140.72	6.31	142.08	4.29	P=0.293
Cardiovascular disorder (No.21)	21	-	-	-	P=0.005
Smoker (No.12)	7	-	5	-	P=0.979

*=Significantly different from control

Table-2 Variation in Some Studied Parameters in Patients Compared to the Control Subjects According to Presence of CV Disorder or Not

Parameters	Patient				Control		P value
	Cardiovascular event				No Cardiovascular event		
	Yes(No.29)		No(No.30)		No. 23		
	Mean	SD	Mean	SD	Mean	SD	
Glucose (mg/dl)	176.29 ab	59.09	128.81 a	47.09	99.83	23.54	0.005
ALP (µkat/l)	115.21	42.30	129.33	70.91	82.70	44.74	0.444
CRP (mg/dl)	15.56	11.80	16.91	13.63	3.91	11.43	0.748
GFR (ml/min)	41.62 a	13.79	48.19 a	18.98	111.26	13.69	0.005
Urea (mg/dl)	78.64 ab	26.11	63.16 a	23.93	28.70	9.54	0.005
Creatinine (mg/dl)	1.76	0.49	1.65	0.62	0.66	0.16	0.359
OPG (pg/ml)	105.65	122.66	93.39	118.90	22.79	46.37	0.233
FGF-23 (pg/ml)	50.7	165	105	408	7.8	3.9	0.613
Aldosterone (pg/ml)	44.80	3.87	53.95	32.42	48.09	20.63	0.317
Calcium (mg/dl)	8.60 a	0.83	8.49 a	1.03	9.31	0.52	0.005
Phosphate (mg/dl)	4.20	0.86	4.12	0.79	4.31	0.55	0.697
Sodium	140.60	6.89	142.38	6.98	142.07	4.28	0.655
Potassium	4.35	0.44	4.03	0.73	4.53	0.74	0.077

a: significantly different from control, b: significantly different from patient with no CVD,

N: Number of subjects

Table (3) Serum level of Osteoprotegerin in of CKD Patients Compared to The Control

Groups Parameters	Stage								P-value
	II(N=11)		III(N=36)		IV(N=12)		Control(N=23)		
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
OPG* pg/ml	77.11	94.40	112.07 ab	121.52	107.97	130.69	22.79	46.37	0.006

a: significantly different from control, b: significantly different from stage IV

c: significantly different from stage III

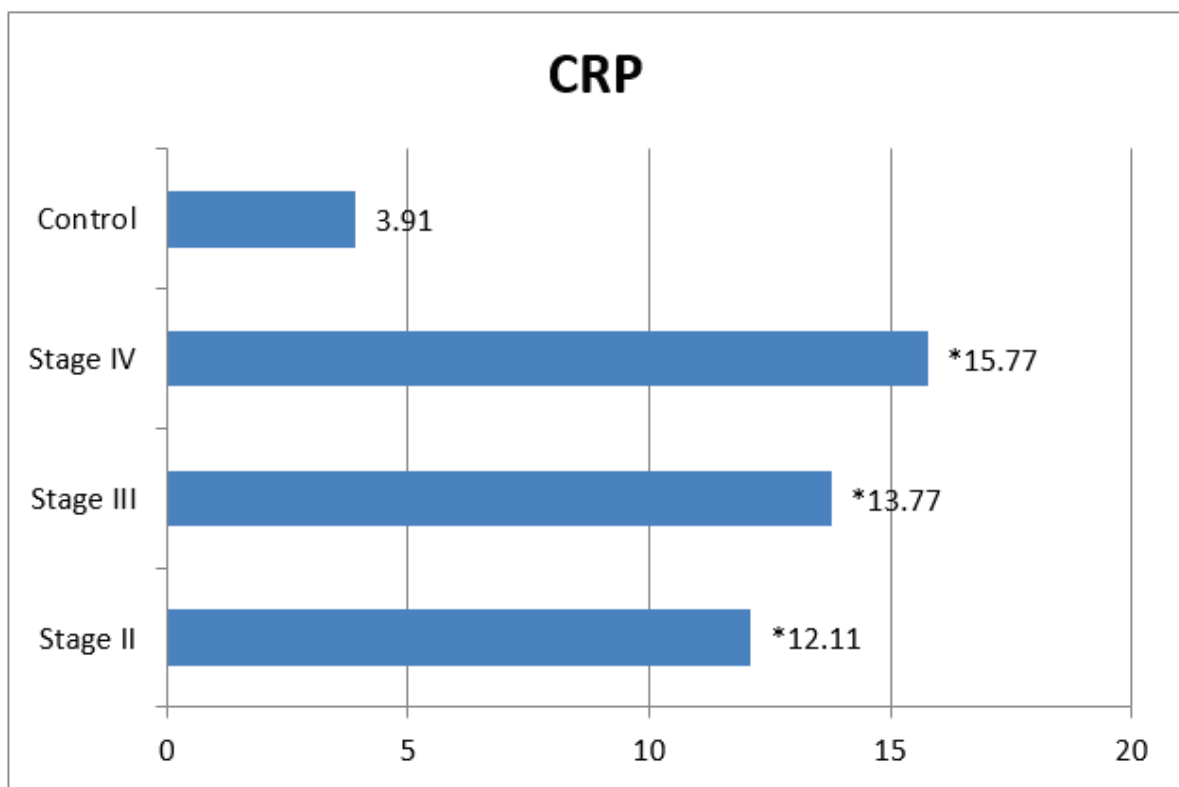


Figure (1) Serum C - Reactive Protein Mean Levels(mg/dl)

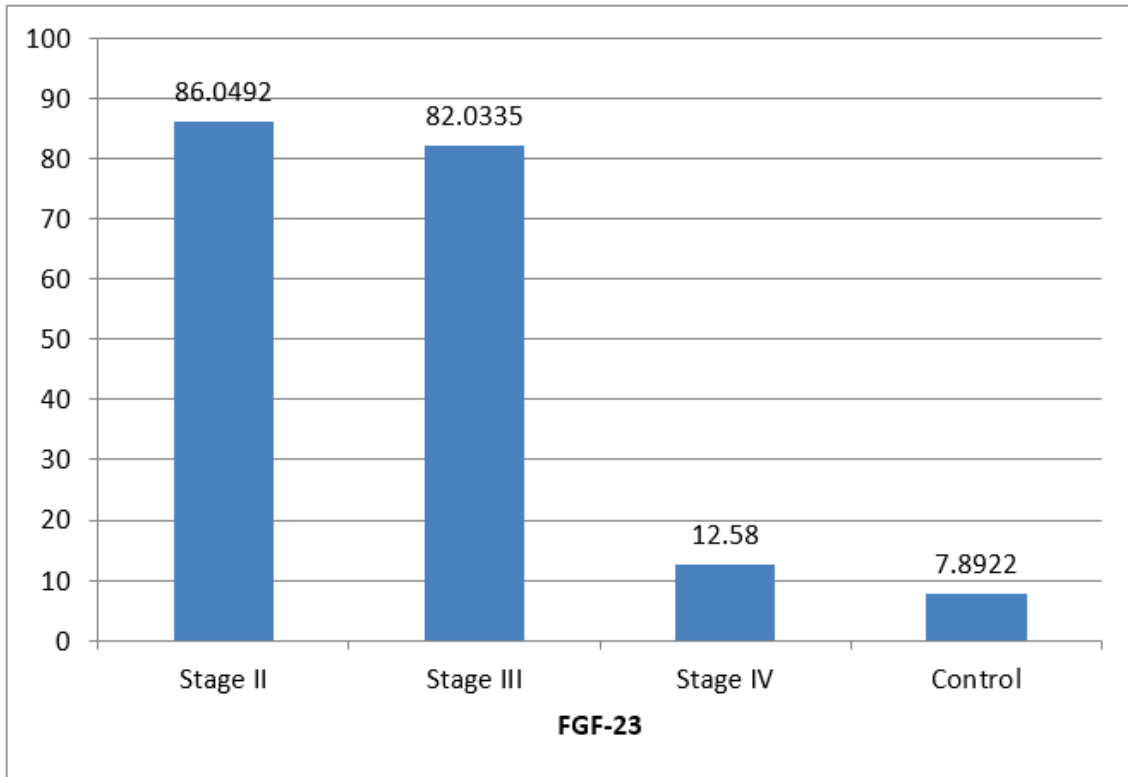


Figure (2) Serum FGF-23 Mean levels Among Various Stages of CKD Patients Compared to The Control Group

Discussion

Considering OPG levels only patients in stage III showed significantly higher levels from controls as well as from those in stage IV as shown in Table 3, and this is consistent with what was shown in studies as serum OPG is elevated in patients with chronic kidney disease where it could predicts the deterioration of kidney function, despite the fact that direct effects of OPG on kidneys are still largely not discovered. [4].Serum OPG activity levels were presented with no significant variation between studied groups (table -2); those results were not in agreement with a study referenced and say that in patients with chronic kidney disease, vascular calcification contributes to increased cardiovascular (CV) morbidity and mortality, [16] this results may be contributed to the small number of patients present in each group.

Whereas, serum CRP levels were significantly elevated in stage III CKD patients with values by about 300% greater than that of controls (figure- 1)

and this is consistent the large Cardiovascular Health Study, as it demonstrates that renal insufficiency was independently associated with elevation of CRP, which may indicate an important pathway mediating the increased cardiovascular risk in persons with kidney disease[10], and this lead to improving the opinion says that inflammation is an essential part of chronic kidney disease (CKD), there has been an exponential growth of interest in inflammation in CKD and end-stage renal disease (ESRD), which led to the evolution in our perception of inflammation as not any longer a novel but rather a well-established, if not traditional risk factor of morbidity and mortality in CKD. [17,18]

The negative correlates serum CRP levels with serum calcium level in CKD patients at significant level, indicates that serum calcium level decreases in CKD patient and this comply with the fact that in patients with CKD there have marked disruption lead to decrease in calcium level called CKD-mineral bone disorder [19], CRP serum levels were significantly elevated in stage III CKD patients [10] but in studies another kind of relation

was found, atherosclerosis considered as inflammatory disease and the amount of coronary Calcium is thought to be an indicator atherosclerosis in uremic and non-uremic patients, so a positive correlation between CRP and vascular calcification can be hypothesized, if this will be a true fact that means inflammation might be considered as a trigger for calcium deposition in the arteries of dialysis patient, in addition we can find that increased body burden of Calcium may or may not be reflected in elevated serum calcium level as normal serum calcium can be maintained in many cases despite a considerable increase in total body burden of calcium due to calcium deposition in the blood vessels and other extra skeletal tissues. [20]

Our result did not show significant variations among studied groups for serum FGF-23 levels, which may be elaborated by the fact that there was a wide difference between minimum and maximum readings that affect statistics significance despite the fact that when we consider figure -2, for the 1st time you will have an impression of confirmed significant difference between patients and controls data, the reason for that wide difference between minimum and maximum reading can be explained by adopting “In patients with CKD, FGF-23 concentrations are constitutively elevated and increase progressively as kidney function worsens, likely as an appropriate compensation to help maintain normal serum phosphate concentrations in the face of declining nephron mass. By the time patients reach end-stage renal disease, where FGF-23 concentrations are often increased 100-to 1000-fold above the normal range, whereas serum phosphate concentrations are only modestly increased or even normal.” [7] Several FGF-23 studies found that increased FGF-23 level is associated with left ventricular hypertrophy, fat mass, and dyslipidemia in elderly patients [21]. This positive correlation between FGF-23 and mortality also is found in the general population with coronary artery disease. [22] FGF-23 is regulated by phosphate (albeit in an indirect manner) and phosphate is correlated with mortality and heart failure, it is possible that this association is not causative. [23]

Conclusion

Serum FGF-23, Aldosterone, Phosphate, Na, K, levels were presented with no significant variation between studied groups. By, considering OPG levels only patients in stage III showed significantly higher levels from controls as well as from CKD patients at stage

IV. Meanwhile, serum CRP levels were significantly elevated in stage III CKD patients with values of about 300% greater than that of controls.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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Description of Risky Sex Practice of Customer Teluk Bayur Brothel (Sex Localization) in Bangka Belitung Province in 2019

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Abstract

A sexual practice that has a high risk occurs in prostitution activity, which results in sexually transmitted diseases. Female sex workers often have no other choice if their customers ask for services that can result in the risk of transmitting sexual diseases such as requests from customers who are refusing to use condoms. The design of this study is descriptive qualitative, and data collected by in-depth semi-structured interviews with three female sex worker and a pimp. Informants were chosen randomly. Data is processed by categorizing or grouping the results of interviews and presented in narrative form. The results showed that sexual practice risked customers Teluk Bayur Brothel occurred in oral sexual services by not using condoms, which were at high risk of gonorrhea. Even though Female CSWs (Commercial Sex Workers) have low education, they have good knowledge about the risk of sexually transmitted diseases, especially HIV/AIDS.

Keywords: *risky sex practice, commercial sex workers, sexually transmitted diseases*

Introduction

Official Sex Localization or commonly known among the people as a brothel is a word that has taboo meaning when we listen, or we read. An official brothel is a place where the practice of trading transactions between commercial sex workers (CSWs) and people who need services from these CSWs. This place is a choice for men who usually have a strong sexual desire that has not been appropriately channeled. The establishment of an official brothel in an official area always interfered with the local government, and it is not free from taxes that must be paid to the government to carry out these activities. Sexual behavior is any behavior that is driven by sexual desire, either with the opposite or the same sex. This type of behavior is diverse, ranging from feelings of attraction to dating behavior, making out, and having sex¹. Safe sexual practice is a way of engaging in sexual activity to avoid contracting sexually transmitted diseases by using condoms and not changing partners. Some define safe sex as sexual behavior without causing

penetration of the penis into the vagina or anus, for example, by holding hands, hugging, kissing.

If one wants to be safe, stay sexually inactive, but if someone is already active, be loyal to just one partner or use condoms of good quality and correct so it can reduce the risk of getting sexually transmitted diseases, HIV and AIDS, and unwanted pregnancy. The types of safe sex are using condoms, using water-based lubricants, having sex without penetration (e.g., kiss), and having sex with a partner who is faithful to each other. While risky sexual behavior is the opposite, where we can have the risk of being transmitted from sexually transmitted infections and HIV and AIDS, such as having sex without wearing a condom². Sexual behavior is divided into two types, namely risky sexual behavior including kissing the lips, made out, groping genitals (masturbating), rubbing genitals and engaging in sex (intercourse) and sexual behavior that does not cause risks including dating, holding hands and hugging, hugging and kissing cheeks³.

The Directorate General of PPM & PL in the IMS PocketBook is that STIs can be transmitted through unsafe sexual intercourse, including sex through unprotected sexual intercourse, condom sex, and oral sex. Also,

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STIs can be transmitted through blood transfusions, exchanging needles, and other sharp objects in the use of drugs, ear piercing, or tattoos. Transmission of STIs can also occur from pregnant women to the fetus during pregnancy, childbirth, or breastfeeding⁴. STIs are not transmitted through skin contact, sweat, saliva, and air. IMS seedlings are mainly present in genital fluids and blood. STIs are contagious, especially when someone's genital fluid or blood that has been infected by STIs enters the body of another person⁴. Behaviors that are at risk for STIs include sexual intercourse without using a condom⁵.

The Teluk Bayur official brothel has existed since the 1980s. Initially, it was a recreation area but turned into an official brothel after commercial sex workers (CSWs) at the Pasir Putih brothel moved to Teluk Bayur a few years ago. In the Teluk Bayur Pangkalpinang localization, there are six guesthouses with around 74 commercial sex workers (CSWs). Most of the guesthouses in this brothel are in permanent form⁶.

Method

The design of this study is descriptive qualitative, data collected by in-depth semi-structured interviews with three female sex workers, and a pimp. Informants were chosen randomly. Data is processed by categorizing or grouping the results of interviews and presented in narrative form.

Results

The research shows that two informants used injection contraception while one informant used implantable contraception. Informants from pimp obtained information that there were no facilities or appeals to use contraception in commercial sex workers. For initiatives in using condoms, the research shows that all informants have initiatives that precede customers in using condom contraception. Informant pimps stated a firm appeal to CSWs to use condoms, but pimps did not provide contraception. In the case of customers who are reluctant or refuse to use condoms, this is rarely the case. Most customers are willing to use condoms. Several times customers are reluctant to use condoms for the same reason that they feel uncomfortable. However, all informants still recommend using it, when researchers ask deeper if given additional money or the customers

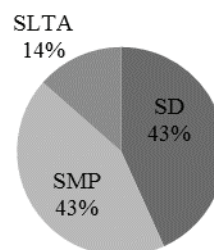
look clean and not diseased, all informants insist that they do not serve unprotected sex.

When the researchers asked what about the other friends, they answered that in this brothel, every time they had to use a condom, because a few years ago, there was a story that a case of HIV/AIDS had been found in some sex workers. Two informants said that they had worked in other regions before and said they were happy to work here because they felt safer, and from the local government, many gave guidance, for example, through counseling and health checks. All CSW informants said that some customers wanted the sensation of oral sex services without using condoms, and the CSWs stated that they did not mind doing it. The CSW Informants stated that they had never met a customer who wanted anal sex services. All CSW informants also stated that they had never suffered from a sexually transmitted disease.

Discussion

The majority of CSW were of elementary and junior high school education, amounting to 86% (Figure 1 and Table 1). Characteristics of CSW based on elementary and junior high school education is equivalent to the initial basic education level. At this level, a person has not been able to understand the information provided optimally. Education will affect a person's absorption of the information he receives. With a good education, the process of growth, development, and change towards more mature, better, and more mature individuals, groups, or communities⁷. In the research, it seems that the understanding of the CSW informants is quite good. Even though their educational background is low, but through socialization and counseling, risk behaviors from customers can be anticipated by CSWs.

Frequency Distribution of Respondents based on Education



Frequency Distribution of Respondents by Age (Years)

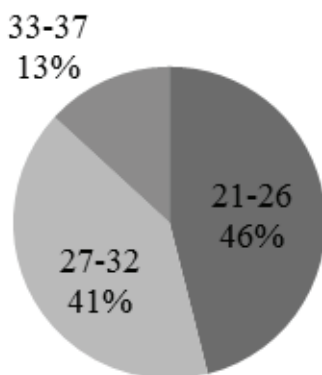


Figure 1. Frequency distribution of respondents based on: (left) education, and (right) age from 74 commercial sex workers. Additional information: SD is equivalent to elementary school, SMP is junior high school, and SLTA is senior high school.

Table 1. Characteristics of Informants

No	Name	Info	Sex	Age (years)	Education	Length of work
1	L	CSW	F	23	SD	2 Years
2	E	CSW	F	28	SLTA	1 Years
3	V	CSW	F	37	SMP	1 Years
4	H	Pimp	F	42	SMP	3 Years

Initiatives in the use of condoms were carried out by all CSW informants. Motives or motivations are stimuli, encouragement, or strength for the occurrence of an action or behavior⁸. The awareness and fear of sex workers will be infected with infectious diseases makes them active to ask their customers first to use condoms before intercourse. The informant revealed that they do not use condoms because the motivation is that customers offer them at more than usual rates, the important thing is not to use condoms. It is in line with research conducted by Oppong et al.⁹, which causes CSW to comply with the desire of their intimate partners not to use condoms because these CSWs are financially unstable or for financial reasons.

One that can directly influence the behavior of condom use on informants is an intimate partner. It is

because the use of condoms always involves two parties, namely CSW and customers. Therefore, the role of the client is enormous in terms of condom use for CSW as well as a party that inhibits condom use. CSW customers do not want to use condoms for several reasons; the first reason is that if they use a condom, they feel uncomfortable, tasteless. In line with research conducted by Zhang et al.¹⁰, that intimate partners always refuse to use condoms when having sex because condoms reduce pleasure. Almost all CSW revealed that clients refused to use condoms for reasons of reducing pleasure. CSW uses condoms only if their clients demand that they use them; clients generally do not demand that condoms be used. In the case of client rejection, CSW does not agree or try to force the client because they are afraid that they will lose the client if they do not agree to have sex.

Another reason why CSW intimate partners do not want to use condoms is that partners want to use condoms unless they believe in their CSW regarding cleanliness and disease, but according to CSW so far, many of their intimate partners do not want to use condoms means they trust us. It is in line with research conducted by Zhang et al.¹⁰ that customers always refuse to use condoms when having sex because of a sign of trust. The inability of CSW in terms of communicating the use of condoms to clients is a very thing that affects CSW in safe sex practices by using condoms. As research conducted by Wojcicki and Malala¹¹, that men have power and women are helpless. It means that there is the powerlessness of CSW in terms of sexual negotiations with clients.

In this study, pimps are one of the parties that have a considerable role related to the use of condoms for CSW. Pimps have a dominant role and are directly related to the practice of using condoms in CSWs. However, the availability of condoms in this study was not facilitated directly by pimps, CSW provided condoms were the prostitutes themselves. Informants provide their condoms by buying at a pharmacy. In general, most of the informants had no difficulty in getting condoms. The availability of condoms can contribute to condom use. The informant revealed that they obtained a condom by buying it at a pharmacy because it was because pimps did not provide condoms

Based on the information from the informant, several customers want unprotected oral sex services. The oral sex causes dangerous gonorrhea and avoids the use of condoms to help spread it¹². The UN agency warned that if someone has contracted gonorrhea, it will now be more challenging to treat and, in some cases, impossible to cure. Sexually transmitted infections quickly develop resistance to antibiotics. Experts say the situation is “quite worrying” because new medicines are available in small quantities. Around 78 million people contract sexually transmitted infections (STI) every year and can cause infertility or infertility. The World Health Organization analyzes data from 77 countries and shows gonorrhea immunity to antibiotics is widespread. Teodora Wi, from WHO, said that there were three cases—in Japan, France, and Spain—where the infection was completely untreatable. He said: “Gonorrhea is a very intelligent bacterium; every time you introduce a new class of antibiotics to treat

gonorrhea, the bacteria become resistant.” Alarmingly, most gonorrhea infections are in developing countries where immunity is more challenging to detect.

Conclusion

Risky sex practices by customers of Teluk Bayur Brothel occur in oral sexual services by not using condoms, which are at a significant risk of the incidence of gonorrhea. The risk of other diseases can be minimized by the unavailability of CSWs to serve customers without using condoms, even if the customer wants it. Even though CSWs have low education, they have good knowledge about the risk of sexually transmitted diseases, especially HIV/AIDS. Their knowledge is through counseling and the Regional Government and experience where HIV/AIDS cases in this place have been known in a few years ago. It is recommended that the official brothel program be continued so that the Regional Government can control the transmission of sexually transmitted diseases.

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Knowledge and Attitudes of Health Workers for the Care of Patients COVID-19 in some cities of the Colombian Caribbean

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Abstract

The objective of this work was to evaluate the knowledge and attitudes of health workers in the Colombian Caribbean for the care of COVID-19. The study is inferential, cross-sectional, quantitative; who used an instrument previously validated and used by Shi et al. The population was made up of healthcare workers who work in the health sector of the cities of Cartagena de Indias and Barranquilla. A high percentage indicates that they do have the knowledge to care for infected patients (80.21%). The main reasons for not having care provision is not having adequate protection elements (66.09%) and fear of contagion or infecting their family (33.91%). In conclusion, greater attention should be paid to the knowledge and activities of healthcare personnel in the Colombian Caribbean health sector for the care of patients infected with COVID-19.

Keywords: COVID-19, Hospital sector, Occupational health. World pandemic.

Introduction

The World Health Organization (WHO) declared the outbreak of COVID-19 as a pandemic in March 2020¹, but in Colombia the State declared itself in the preparatory phase since the WHO exposed the first

case of coronavirus, noting that the entities Ministerial officials were preparing to face their impact in the country². Thus, since January 22, 2020, the community was informed that the Ministry of Health (MinSalud) was updating the detection and treatment protocols for infected patients. However, despite the contingency and mitigation measures that the country has adopted, to date Colombia reports 3105 confirmed cases, 131 deaths and 452 recovered patients³. Although the policies and interventions seek to curb the epidemic outbreak by reducing the demand on hospitals to avoid the collapse of the health system and to stop the growth of the epidemic by preventing healthy personnel from contagion, the epidemiological curve continues to increase, testing the system since it exposes the weaknesses that are

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possessed, such as the insufficiency of hospital beds and ICUs, deficiencies in infrastructure and lack of resources for patient care and personal protection elements (PPE) for health workers, who play a fundamental role in these cases and are study subjects of the present investigation^{4,5,6,7}. The attitude presented by medical personnel is important to face the epidemic, in the same way, they feel safe having government support and resources for patient care^{8,9,10}.

Various studies have investigated the knowledge and attitudes of health workers in epidemic situations, working conditions and their willingness to care for infected patients, obtaining as a result psychosocial repercussions related to the concern about contagion, which generates an increased burden. stress, discomfort from the use of PPE and disagreements to comply with quarantine measures when they had low knowledge about SARS, when they feel less fear and when health centers did not work well^{11,12} and indicating that it is necessary to encourage adherence to the use of preventive measures, psychological support, and continuing education to prevent uncomfortable attitudes in care^{13,14}.

There are patients in hospitals in the Colombian Caribbean who have been infected with COVID-19, however, the knowledge and attitudes of health personnel

towards infectious diseases and their willingness to work during the COVID-19 outbreak has not yet been investigated, For all of the above, the objective of this study was to assess the knowledge and attitudes of health workers in the Colombian Caribbean for the care of COVID-19, using the instrument developed by Shi et al.¹⁵ and following the structure of the study by Daugherty et al.¹⁶.

Materials and Methods

An inferential, analytical, cross-sectional, quantitative study was carried out. The population was made up of healthcare workers who work in the health sector of the cities of Cartagena de Indias and Barranquilla. Given the conditions of confinement due to the current pandemic and because there is no database with professionals associated with this sector in the cities considered, a non-probability sampling was carried out for convenience¹⁷. To determine the sample size, the formula for proportions with infinite population is used, according to García et al.¹⁸ the minimum required sample value is given by:

$$n \geq \frac{Z_{1-\alpha/2}^2 \hat{p}(1 - \hat{p})}{\varepsilon}$$

n is the sample size

$Z_{1-\alpha/2}^2$ is the value of the normal distribution when you have a confidence level of $(1 - \alpha) \times 100\%$

\hat{p} is the estimated proportion of the population parameter.

ε is the maximum permissible error when moving away from the true value of the proportion.

This study had a 95% confidence level, a maximum error of estimation of less than 5% (4.16%) and given the absence of a pilot study that allows an approximation of it, it is assumed $p = 0.5$, since said value maximizes the value of n. Under the above considerations, a minimum sample size of 283 workers dedicated to the trade was obtained, among which are the professions of: Doctors, Nurses, Surgical Instructors, Nursing Assistants, Bacteriologists, Physiotherapists, Pharmacists and Technicians or Technologists in Care Prehospital.

Instrument: For the evaluation of knowledge and attitudes of health personnel regarding COVID-19, the questionnaire developed by Shi et al.¹⁵, which was based on the guidelines of the study by Daugherty et al.¹⁶. The data was collected through the Google Forms online survey tool, which allows the design of questionnaires, data collection and personalized reports. Within the instrument, the respondents were asked for information related to their sociodemographic conditions, such as: age, gender, marital status, profession and

complementary training studies; as well as information associated with the level of knowledge, experience and preparation in COVID-19, among these are: Previous training, sources of information to acquire knowledge, experience in caring for and caring for patients, adequate knowledge and protection measures, understanding of the risks of any epidemic for both patients and workers, knowledge in the care of patients and other staff during an epidemic and provision of patient care.

Process: Once the questions of the instrument were included in Google Forms, we proceeded to send the link through the WhatsApp application to different health care workers, who could be located by this means; likewise, informed consent was sent, with the explanation of the study conditions. Requests for completing the survey were made until the 283 responses required in the study were obtained. The information was collected during the first three weeks of April 2020.

Analysis of data: Initially, they are statistically described (totals and percentages) for both the sociodemographic variables and the variables associated with the knowledge and experience of the workers, later chi-square tests are performed to determine the variables that are related to the will and disposition to care for patients with COVID-19; Subsequently, graphs are obtained for the variables that result with a significant relationship in order to identify the meaning of said association. Finally, a logistic regression model is obtained to make predictions for workers who are willing to care for patients with COVID-19, based on their sociodemographic characteristics and the experience and knowledge they have of the pandemic. For carrying out the analyzes. Excel version 10 and the statistical software SPSS version 24 were used.

Ethical approval: All research was conducted with integrity and in line with generally accepted ethical principles. The survey was carried out in agreement with health personnel. All the personal information of the personnel involved is kept confidential, the informed consent and the protocol were in accordance with the ethical standards of the Declaration of Helsinki ¹⁹.

Results

Description of the variables: Statistics on the availability and willingness of employees to serve patients with COVID-19 show that 204 employees are willing to provide care, which corresponds to 72%; while the remaining 28% do not have the will to care for patients with the virus.

According to Table 1, it is observed that more than 50% of the employees are under 30 years old (53.7%); while only 4.6% are over 50 years old. Regarding gender, very similar proportions are shown for males and females (40.99% and 59.01% respectively). For marital status, 44.17% are single and 55.83% live with someone or have previously had a conjugal marital relationship. The information collected shows that the highest proportions in the profession are found in nurses, nursing assistants and doctors (28.98%, 21.91% and 19.43%, respectively.); Among the less frequent professions are Bacteriologists, Physiotherapists and Pharmaceutical Chemists (2.12%, 2.83% and 0.71%, respectively). In relation to complementary training, it is observed that the majority of workers have completed courses for complementary (59.01%); while only 13.07% and 2.83% correspond to people who have completed specialization and master's degrees, respectively, as complementary preparation.

Table 1: Description for the sociodemographic variables.

Variable	Modality	Total	Percentage
Age	20 to 25 years	68	24.03
	26 to 30 years	84	29.68
	31 to 35 years	44	15.55
	36 to 40 years	37	13.07
	41 to 45 years	24	8.48
	46 to 50 years	13	4.5
	51 to 55 years	7	2.47
	56 to 60 years	4	1.41
	<60 years	2	0.71
Gender	Male	116	40.99
	Female	167	59.01
Marital status	Married	76	26.86
	Separated	3	1.06
	Single	125	44.17
	Free Union	79	27.92
Profession	Nursing Assistant	62	21.91
	Bacteriologist	6	2.12
	Nurse	82	28.98
	Physiotherapist	8	2.83
	Surgical Instrumenter	27	9.54
	Doctor	55	19.43
	Pharmaceutical chemist	2	0.71
	Technician / Technologist in Pre-hospital Care	41	14.49
Complementary training studies	courses	167	59.01
	Graduates	71	25.09
	Specialization	37	13.07
	master's degree	8	2.83

Table 1 shows the descriptive statistics for the variables associated with workers’ knowledge and experience of the disease, showing that a significant percentage (56.18%) stated that they had completed previous training on COVID-19. The most frequent source of information used by workers is the internet (59.36%), followed by scientific journals (23.67%); while newspapers and radio are the least used for information (0.35%, each). With regard to experience, it is observed that only 37.87% of health personnel state that they have the necessary experience to care for patients with COVID-19. With regard to knowledge about the virus, understanding of the risks associated with it and knowledge about personal and patient care, it is observed that a high percentage of employees indicates that if they present such knowledge (80.21%, 92.23% and 85.16%, respectively).

Table 2: Description for the variables associated with knowledge, experience and preparation in COVID-19.

Variable	Modality	Total	Percentage
You have completed a COVID-19 Pre-Training program	No	159	56.18
	Yes	124	43.82
Information sources were important to acquire knowledge about COVID-19	Internet	168	59.36
	Newspapers	1	0.35
	Radio	1	0.35
	Scientific Journals	67	23.67
	Television	46	16.25
Has gained experience in treating and caring for patients with COVID-19	No	176	62.19
	Yes	107	37.81
Has adequate knowledge of COVID-19 and protective measures	No	56	19.79
	Yes	227	80.21
You are sure you understand the risks of any epidemic for both patients and medical staff	No	22	7.77
	Yes	261	92.23
You are sure you know how to take care of yourself, your patients, and other staff during an epidemic	No	42	14.84
	Yes	241	85.16

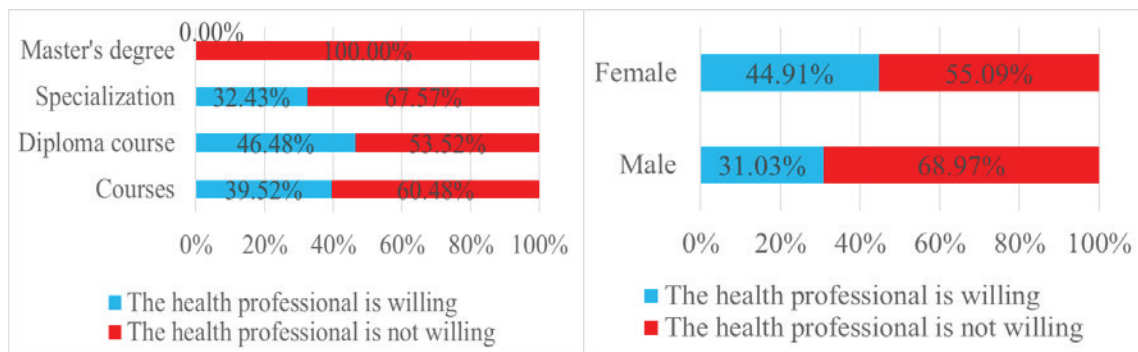
Chi-square test: Table 3 shows the results of the Chi-square test between the sociodemographic variables and the willingness to care for patients with COVID-19. These results show that the variables: Gender and complementary training studies show a significant relationship with the willingness and willingness to care for patients with COVID-19 (p-value <0.05); while the profession shows a highly significant relationship (p-value <0.01).

Table 3: Chi-square test between sociodemographic variables and willingness to care for patients with COVID-19.

Variable	Chi-square value	Degrees of freedom	p-Value
Age	9.866	8	0.275
Gender	5.529	1	0.019**
Marital status	2.014	3	0.569
Profession	24.671	8	0.002**
Complementary studies	7.859	3	0.049*

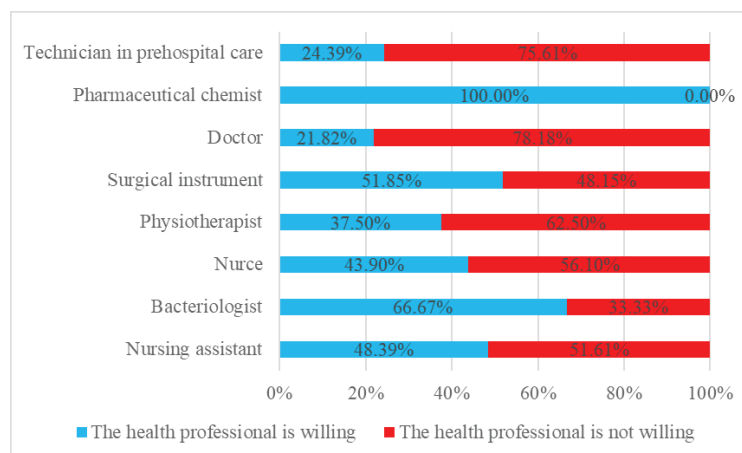
*: Significant relationship (p <0.05). **: Highly significant relationship (p <0.01)

Next, the mosaic graphs are shown in Figure 1 to observe the behavior of these relationships.



(a) Further training

(b) Gender



(c) Profession

Figure 1: Mosaic charts for the relationship between sociodemographic variables and the willingness and willingness to care for patients with COVID-19.

The mosaic charts show that men show a higher percentage of workers willing to care for patients with COVID-19 compared to women; while workers with master’s degrees and graduates are the most willing to care for patients with the virus. Regarding the profession, it is observed that pre-hospital care technicians, doctors and physical

therapists show a greater willingness to care for patients, the opposite occurs with pharmaceutical chemists, surgical instructors and bacteriologists showing a higher proportion of people who indicate that they are not willing to attend patients with COVID-19; while nurses and nursing aides do not show a determining profile.

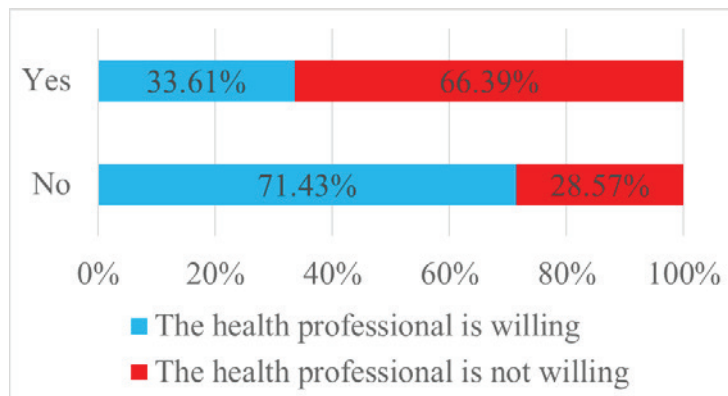
Table 4: Chi-square test between the variables associated with knowledge, experience and preparation and the willingness to care for patients with COVID-19.

Variable	Chi-square value	Degrees of freedom	p-Value
You have completed a COVID 19 Pre-Training program	16.664	1	0.000**
Information sources were important to acquire knowledge about COVID 19	13.615	4	0.009**
Has gained experience in treating and caring for patients with COVID19	20.353	1	0.000**
Possesses adequate knowledge of COVID 19 and protection measures	21.112	1	0.000**
You are sure you understand the risks of any epidemic for both patients and medical staff	11.233	1	0.001**
You are sure you know how to take care of yourself, your patients, and other staff during an epidemic	21.459	1	0.00**

*: Significant relationship (p <0.05). **: Highly significant relationship (p <0.01)

The Chi-square test given in Table 4 shows that all the variables associated with training, knowledge and experience about COVID-19 show a highly significant relationship with the willingness to care for patients with said virus (p values less than 0.01).

In Figure 2, the mosaic graphs for the associations between the variables related to knowledge and experience and the willingness to care presented by health workers are shown. The results



show that those who have completed training, have acquired experience in the care of COVID-19, have knowledge on the subject, understand the risks and know the proper care that must be taken, are characterized by showing a willingness to care for patients with COVID -19, like professionals who use scientific journals as an

information medium; while those who have reported COVID-19 in newspapers and radio tend to be unwilling to care for patients with the virus.

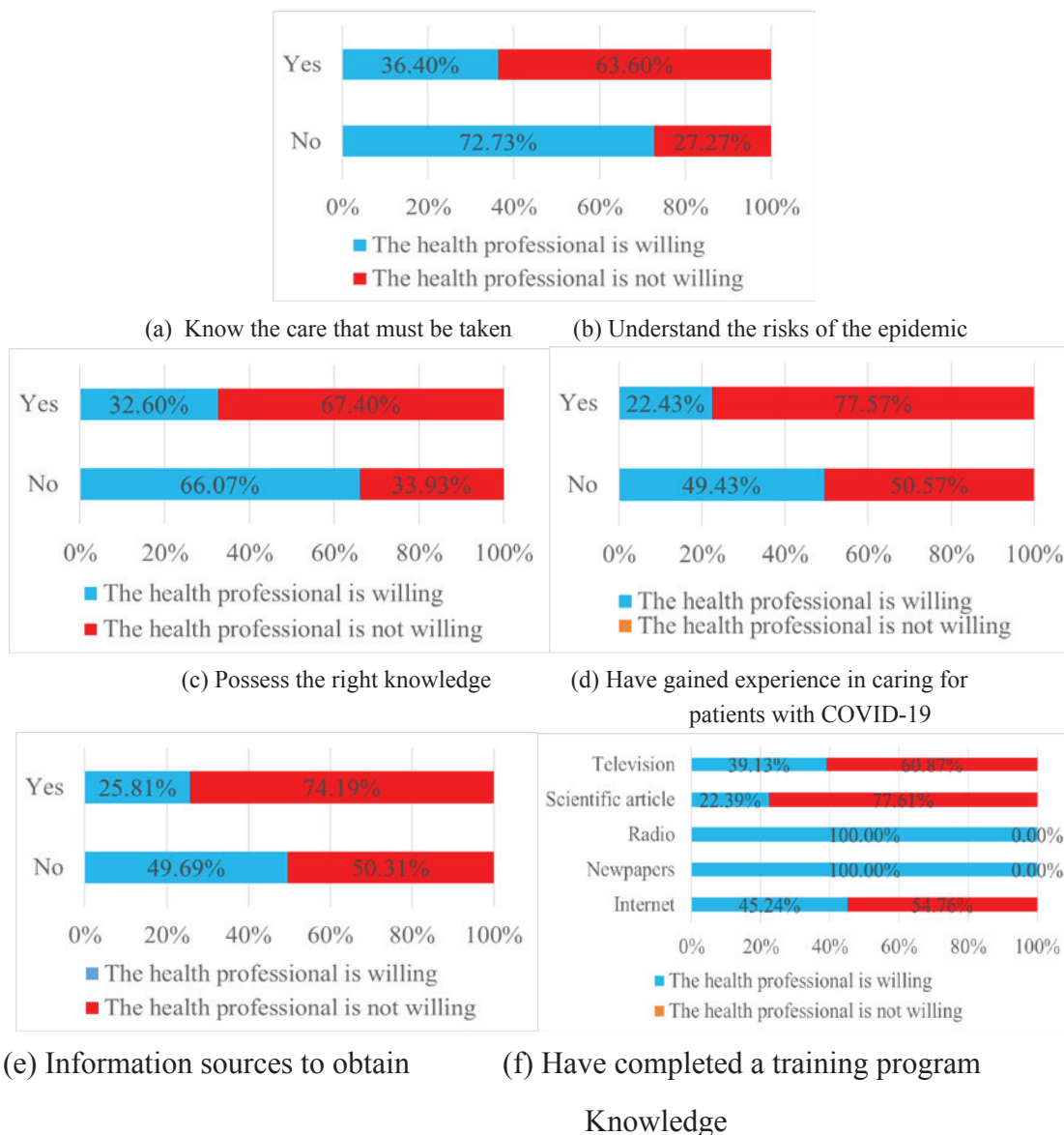


Figure 2: Mosaic graphs for the relationship between variables associated with knowledge, experience and preparation and the willingness to care for patients with COVID-19.

Logistic Model: Initially, a model was carried out where all the variables that were significantly related in the Chi-square test were considered with the variable “willingness and willingness to care for patients with COVID-19” and with the variables that were influential

in this first model, a second model fits.

Table 5 shows the Logistic regression model to identify the conditions of the sociodemographic variables and of knowledge and experience that can influence the behavior of the disposition of employees in care during the emergency.

Table 5: Logistic regression model for prognosis of willingness and willingness to care for patients with COVID-19.

	B	p-Value	Exp(B)	90% C.I. for EXP(B)	
				Lower	Upper
Position					
Nursing Assistant	-2.628	0.025*	0.072	0.007	0.725
Bacteriologist	-0.669	0.159	0.1512	0.202	1.298
Nurse	-1.994	0.043*	0.136	0.02	0.943
Physiotherapist	-0.651	0.15	0.522	0.215	0.264
Surgical Instrumenter	-0.815	0.364	0.443	0.076	2.574
Doctor	0.425	0.421	1.53	0.543	4.315
Pharmaceutical chemist	-20.696	0.999	0	0	0
Has not gained experience in treating and caring for patients with COVID-19	-0.959	0.002**	0.383	0.212	0.694
Does not have adequate knowledge of COVID-19 and protection measures	0.992	0.005**	2.697	1.35	5.39
Not sure you understand the risks of any epidemic for both patients and medical staff	-0.948	0.048*	0.388	0.134	1.123
Constant	0.858	0.124	2.359	1.234	23.451

*: Significant relationship (p <0.05). **: Highly significant relationship (p <0.01)

Discussion

The chi-square test shows that all the variables considered in knowledge and experience of care, are significantly related to the willingness to care for patients with the virus, showing that the lack of knowledge, preparation and experience definitely influences that workers show little will in providing the necessary accompaniment to infected patients. Previous studies have shown that the training of hospitals and related organizations plays a vital role in the prevention of infectious diseases²⁰. Furthermore, it is important to empower health workers by supporting their ability to acquire and use evidence-based information²¹. Other studies have suggested that the implementation of appropriate education and protection measures improved

the willingness of staff members to work²².

Finally, within the limitations of the study, we have that we could not exclude the possible impact of selection bias. However, we registered the participants through WhatsApp, the most used social tool in Colombia, which has a powerful network of friends. This allows questionnaires to be administered through WhatsApp using a convenient sampling method²³. Similarly, the results of this study are based on a self-reported questionnaire. Previous studies have suggested that self-reported practice may not represent actual practice²⁰. Therefore, more research is needed to confirm the findings of this study.

Conclusions

With this work it can be concluded that a trained and prepared staff is required to face the pandemic in health institutions. This preparation must be in the mental, knowledge and physical spheres, equipping health personnel with the necessary tools to face the health situation; with an institutional and individual co-responsibility of each professional. The lack of security and knowledge of the disease leads to the personnel who maintain direct contact with patients, expressing fear of being infected during their performance (nursing assistants and professional nurses); in addition, because they are not provided with adequate PPE for care. The results of this study reveal that training, information and practice to gain experience are essential in the different health professions; but that the disposition, the will and the vocation to the service, are not sufficient when the security measures are not guaranteed and affect the quality of care for patients diagnosed positive with COVID-19.

Conflict of Interest: Nil

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Ethical Clearance: Obtained from the Declaration of Helsinki

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Environmental Factors Associated with the Incidence of Dengue Hemorrhagic Fever (DHF) In Purbalingga Regency, Central Java Province, Indonesia in 2019

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Abstract

Background: DHF is one of the contagious diseases that remains a major problem both in the world and in Indonesia. Purbalingga Regency is one of the regencies in Central Java that constantly reports DHF cases every year. The increase of DHF cases in Purbalingga Regency in January-June 2019 almost tripled compared to the number of cases in 2018. The residential environment plays a significant role in the transmission of DHF. Therefore, it is necessary to conduct research on environmental factors associated with the incidence of DHF in Purbalingga Regency.

Method: This study used a case-control study design. The data were collected using questionnaires through interviews and observations. The total sample of 408 respondents was taken from two subdistricts with the highest cases. Univariate, bivariate (chi-square), and multivariate (Logistic Regression) analysis were employed in this study to analyze the relationship between environmental factors with the incidence of DHF.

Result: The results of the study indicate that environmental factors associated with the incidence of DHF in Purbalingga Regency in 2019 were the availability of mosquito gauze (OR: 2.30; 95% CI: 1.379-3.829) and the presence of discarded trash (OR: 1.91; 95% CI: 1.249-2.933).

Conclusion: The availability of mosquito gauze and the presence of discarded trash were environmental factors associated with the incidence of DHF in Purbalingga Regency. Therefore, efforts are required to promote health regarding the mosquito nest eradication (PSN) 3M plus and sustainable waste management among the inter-related sectors in the context of controlling DHF in Purbalingga Regency.

Keywords: DHF, mosquito gauze, discarded trash, Purbalingga Regency

Introduction

DHF is one of the contagious diseases that remains a major problem both in the world and in Indonesia. Based on WHO data, 2.5 billion people worldwide live in endemic dengue countries and are at risk for suffering from Dengue Fever/Dengue Hemorrhagic Fever (DF/DHF)⁽¹⁾. In Indonesia, the Incidence Rate (IR) for 3 consecutive years, in 2016 was 78.85 per 100,000 population, in 2017 was 26.10 per 100,000 population,

while in 2018 was 24.75 per 100,000 population⁽²⁾.

DHF control is focused on breaking the chain of transmission by carrying out vector control. One of the vector controls is by managing the environment to reduce vector population density and to reduce human-vector-virus contact⁽³⁾. The residential environment has a major role in the incidence of DHF because it is closely related to breeding sites and vector resting sites that can affect vector density⁽⁴⁾⁽⁵⁾⁽⁶⁾⁽⁷⁾.

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Purbalingga Regency is one of the regencies in Central Java that constantly reports DHF cases every year. In 2018, Purbalingga Regency was ranked fifth

with the most cases out of 35 Regencies reporting DHF cases. The number of DHF cases was 190 cases (IR: 20.54 per 100,000 population) and the number of deaths was 3 cases (1.58%)⁽⁸⁾. Based on data from the Infectious Disease Prevention and Control Section (P2PM) there was a significant increase in cases in January-June 2019 with 492 cases (IR: 53.69 per 100,000 population) and the number of deaths was 3 cases (CFR: 0.61%). Of the 18 subdistricts, two subdistricts with the highest number of cases are Kalimanah and Purbalingga Subdistricts⁽⁹⁾.

Based on these problems, it is necessary to conduct research on environmental factors (occupancy density, house wall, availability of mosquito gauze, availability of ornamental plants, availability of plants surrounding the house, lighting, presence of discarded trash and presence of dengue larva) associated with the incidence of DHF in Purbalingga Regency to provide valuable information to the community and related agencies.

Methods

This research was a case-control analytic study. The data source was from a study entitled "Factors Associated with the Incidence of Dengue Hemorrhagic Fever (DHF) in Two Subdistricts of Purbalingga Regency in 2019". The population in this study was the entire population of Purbalingga Regency, while the sample was the population of two subdistricts with the highest number of DHF cases in January-June 2019, namely Kalimanah Subdistrict and Purbalingga Subdistrict, who have settled more than 1 year at the time of data collection.

The case group was residents who lived in two subdistricts and have been treated in a Public Health Center/Hospital with DHF diagnosis and symptoms in January-June 2019. The criteria for inclusion in the case group were the population who has been recorded as DHF sufferers through platelet count examination results ≤ 100.000 cells/mm³ in the DHF Infectious Disease Prevention and Control Section (P2PM) report in January-June 2019 and was willing to become

respondents. The exclusion criteria of the case group were the population who did not live permanently in the two subdistricts and those who have passed away.

The control group was residents who lived in two subdistricts and have never been treated at the Public Health Center/Hospital with a diagnosis of DHF and have no symptoms of DHF. The criteria for inclusion in the control group were residents who have never been treated at the Public Health Center/Hospital with a diagnosis of DHF without platelet count examination and have no symptoms of DHF, residents were the case's neighbors who lived in the 10 nearest houses from the case's house, and were willing to be respondents. The exclusion criteria for the control group were the population who did not live permanently in the two subdistricts and had family members living in the same house who were diagnosed with DHF. For the respondents in the case and control groups who were under 12 years old, then the interviewee was the respondent's parents or family members who understand the respondent's condition.

The number of samples in this study was 408 respondents consisting of 136 cases and 272 controls. The case group was the total cases, while the control group was taken from the 10 nearest houses from the case's house selected by simple random sampling. This research was conducted in January 8-February 10, 2020, through interviews and observations using a questionnaire. The interviews were conducted by health cadres who were trained in advance. The data that have been collected were edited by checking the questionnaire filling, coding the data, entering the data into the processing system, and checking the completeness and correctness of the data. Data analysis was performed using the SPSS v.21 program (univariate, bivariate (Chi-Square), and multivariate (Logistic Regression)). The association was assessed by Odds Ratio (OR) and Confidence Interval (CI) of 95%.

Result

Table 1. Frequency distribution and the relationship between environmental factors and the Incidence of DHF

Variable	Case (n = 134)		Control (n=272)		OR	95% CI	P-value
	n	%	n	%			
Occupancy Density							
Density	7	5.22	11	4.04	1,31	0.495-3.454	0.774
Non-Density	127	94.78	261	95.96	1		
House Wall							
Semi Permanent	9	6.72	8	2.94	2,38	0.895-6.305	0.128
Permanent	125	93.28	264	97.06	1		
Availability of Mosquito Gauze							
No	109	81.34	182	66.91	2,16	1.304-3.564	0.004
Yes	25	18.66	90	33.09	1		
Availability of Ornamental Plants							
Yes	35	26.12	63	23.16	1,17	0.728-1.890	0.595
No	99	73.88	209	76.84	1		
Availability of Plants Surrounding the House							
Yes	59	44.03	106	38.97	1,23	0.810-1.873	0.385
No	75	55.97	166	61.03	1		
Lighting							
No	52	38.81	74	27.21	1,70	1.095-2.630	0.024
Yes	82	61.19	198	72.79	1		
Presence of discarded trash							
Yes	69	51.49	101	37.13	1,80	1.182-2.732	0.008
No	65	48.51	171	62.87	1		
Presence of dengue larva							
Yes	31	23.13	44	16.18	1,56	0.932-2.611	0.118
No	103	76.87	228	83.82	1		

Based on the results of the univariate analysis in Table 1, it appears that the number of samples analyzed is 406 respondents. This is due to two respondents of the case group have passed away. The highest proportion of occupancy density was in the non-density category in the case group (94.78%) and in the control group (95.96%). The highest proportion of house wall condition variable was in the permanent category in the case group (93.28%) and in the control group (97.06%). The highest proportion of the availability of mosquito gauze was in the category of not using mosquito gauze in the case group (81.34%) and in the control group (66.91%). The highest proportion of the availability of ornamental plants was in the category of no ornamental plants in the case group (73.88%) and in the control group (76.84%). The highest proportion of the availability of plants surrounding the house was in the category of no plants surrounding the house in the case group (55.97%) and

in the control group (61.03%). The highest proportion of lighting was in the category of light can access the entire rooms of the house in the case group (61.19%) and in the control group (72.79%). The highest proportion of the presence of discarded trash in the case group was in the category of the presence of discarded trash (51.49%) while in the control group was in the category of no presence of discarded trash (62.87%). The highest proportion of the presence of dengue larva was in the category of no presence of dengue larva in the case group (76.87%) and in the control group (83.82%).

The results of the bivariate analysis (Table 1) showed that statistically significant variables (p-value<0.05) related to the incidence of DHF were the availability of mosquito gauze (OR: 2.16; 95% CI: 1.304-3.564), lighting (OR: 1.70; 95% CI: 1.095-2.630) and the presence of discarded trash (OR: 1.80; 95% CI: 1.182-2.732).

Table 2. Full Model of Environmental Risk Factors for Incidence of DHF

Variable	OR	95% CI	P-value
House Wall	2.28	0.823-6.290	0.113
Availability of mosquito gauze	2.20	1.308-3.706	0.003
Lighting	1.41	0.886-2.247	0.146
Presence of discarded trash	1.86	1.209-2.870	0.005
Presence of dengue larva	1.23	0.711-2.112	0.465

Table 2 shows a full model of the result of bivariate analysis. House wall and the presence of dengue larva variables were included in the multivariate analysis because of the p-value <0.25.

Table 3. Final Model of Environmental Risk Factors for Incidence of DHF

Variable	OR	95% CI	P-value
Availability of mosquito gauze	2.30	1.379-3.829	0.001
Presence of discarded trash	1.91	1.249-2.933	0.003

Table 3 is the fittest model of multivariate analysis. Based on multivariate analysis, it appears that environmental factors related to the incidence of DHF in Purbalingga Regency in 2019 were the availability of mosquito gauze and the presence of discarded trash.

Discussion

From this case-control study, it is identified that environmental risk factors associated with the incidence of DHF in Purbalingga Regency in 2019 were the availability of mosquito gauze (OR: 2.30; 95% CI: 1.379-3.829) and the presence of discarded trash (OR: 1.91; 95% CI: 1.249-2.933).

The availability of mosquito gauze in ventilation was the most dominant environmental factor associated with the incidence of DHF in Purbalingga Regency. The results show that houses that did not use mosquito gauze had 2.30 times higher risk compared to houses that used mosquito gauze. These results are consistent with the results of the study by Ekel et al (2017) in Manado, which showed that the use of mosquito gauze was a risk factor for DHF (OR: 2.37; 95% CI: 1.14-2.99)⁽¹⁰⁾. This study is also in line with research conducted by Tamza et al (2013) in Lampung⁽⁵⁾.

Based on Table 1, the highest proportion in the case and control group was in the category of not using mosquito gauze, which means that the community did not have an adequate understanding of the benefits of installing mosquito gauze against vector control. Whereas the use of mosquito gauze is physical vector control which is one of the mosquito nest eradication (PSN) 3M plus activities⁽¹¹⁾. The availability of mosquito gauze can reduce the risk of contact between humans and mosquitoes to reduce the transmission of dengue virus⁽¹²⁾⁽¹³⁾. In addition, the availability of mosquito gauze can prevent mosquitoes from entering the house, prevent mosquitoes from resting inside the house and prevent mosquitoes from biting people inside the house⁽¹⁴⁾.

The other environmental factor related to the incidence of DHF in Purbalingga Regency was the presence of discarded trash. Discarded trash is one of the water reservoirs that potentially become a breeding site for *Aedes* mosquitoes⁽¹¹⁾. The results show that residents' houses surrounded with discarded trash had

1.91 times higher risk of getting DHF compared to those without discarded trash. This result is in accordance with the study of Swain et al (2019) in Odisha, India, which showed that mosquito breeding sites which one of them was the presence of discarded trash, was a risk factor for DHF (OR: 1.7; 95% CI: 1.2-2.6)⁽¹⁵⁾. In addition, this study is in line with research conducted by Sulaiman et al (2015) in Pasir Mas, Kelantan, Malaysia⁽¹⁶⁾.

The presence of discarded trash significantly contributed to the *Aedes aegypti* mosquito population density⁽¹⁷⁾. According to the research of Hayes et al (2003) in El Salvador, used cans, used plastic containers, and used tires were associated with the incidence of DHF⁽¹⁸⁾. One of the causes of the presence of discarded trash surrounding the respondent's house was because of the community behavior to sell discarded trash to a rubbish collector. The community was not yet aware of the importance of disposing of/reusing discarded trash to prevent them from potentially become mosquito breeding sites⁽¹¹⁾⁽¹⁹⁾. In addition, the existing waste management has not yet been implemented sustainably even though in several villages have been established the Waste Bank.

Conclusion

The availability of mosquito gauze and the presence of discarded trash were environmental factors associated with the incidence of DHF in Purbalingga Regency. This implies that it requires health promotion about the mosquito nest eradication (PSN) 3M plus to increase public awareness and participation to break the chain of DHF transmission. In addition, there is a need for sustainable waste management among the inter-related sectors such as Public Health Center, Village Government, and the Environmental Services. DHF control measures in Purbalingga Regency can only be implemented through the participation of community and inter-related sectors. In addition, the limitation of this study is that there are no measurements/calculations on several variables. Therefore, for future research, it is recommended to examine more variables related to environmental factors as input in controlling DHF, especially in Purbalingga Regency.

Ethical Consideration

The data source was from a study entitled "Factors

Associated with the Incidence of Dengue Hemorrhagic Fever (DHF) in Two Subdistricts of Purbalingga Regency in 2019” which was approved by The Research and Community Engagement Ethical Committee of the Faculty of Public Health at the University of Indonesia (Number:Ket-58/UN2.F10/PPM.00.02/2020)

Competing Interests: The authors have declared that no competing interest exists.

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Biotin-Responsive Basal Ganglia Disease: EEG Characteristics and Seizure Phenotypes

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Abstract

Objective: To discuss EEG findings and seizure phenotypes in “biotin-responsive basal ganglia disease” (BRBGD), a rare, autosomal recessive, life-threatening, but potentially reversible encephalopathy with characteristic MRI findings.

Methods: We report on two patients with BRBGD in whom we correlated the EEG findings with MRI abnormalities. We also review the literature on EEG and seizure types in this syndrome.

Results: Our patient 1 had a focal electrographic seizure corresponding to a homotopic focal MRI pathology. Patient 2 had a normal EEG. The literature review showed both partial and generalized convulsive seizures with occasional occurrence of infantile spasms.

Conclusion: 1- The data suggest both electro-clinical and electro-anatomical dissociation in BRBGD. 2-Seizures in BRBGD are primarily caused by the underlying metabolic encephalopathy, although focal epileptiform discharges may signify a homotopic focal cerebral pathology caused by BRBGD.

Keywords: Biotin, Thiamine, Seizure, Electroencephalography.

Introduction

In 1998, Ozand et al.¹ described 10 patients, mostly from the Arabian Peninsula, who presented with episodic subacute encephalopathy manifested by confusion, bulbar symptoms, quadriparesis or quadriplegia, extrapyramidal symptoms, and occasional central facial weakness, external ophthalmoplegia, and seizures. The patients rapidly responded to biotin, hence, biotin-

responsive basal ganglia disease (BRBGD). It was hypothesized that the pathogenesis of this autosomal recessive syndrome was “a defect in the transportation of biotin across the blood-brain barrier”. Later, it was discovered that availability of biotin is a sine qua non in the expression of the gene SLC19A3²⁻⁴. Accordingly, the mutation of this gene (due to biotin deficiency) is primarily responsible for the symptomatology described above. The diagnosis of this syndrome is underpinned by the characteristic MRI findings⁵⁻⁷.

Various investigators have reported seizures and EEG abnormalities in BRBGD, which we will review in this paper. Moreover, we report, for the first time, on a patient with BRBGD whose EEG showed focal

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electrographic seizures during sleep, corresponding to a focal, homotopic subcortical MRI pathology. We will also discuss a second case with a normal EEG.

Case 1

The patient was a 9-year-old Saudi male who was admitted to the hospital with a rapid onset of difficulty speaking and difficulty walking without antecedents. Two years earlier, the patient had a similar episode along with a seizure episode prompting his evaluation at a local clinic where he was placed on levetiracetam. Within 2 months the patient completely recovered from his symptoms. His family then discontinued seizure therapy.

The patient’s birth history and developmental milestones were unremarkable. His family history was significant in that the parents were consanguineous.

The neurological examination showed the patient to be awake and alert. He had severe dysarthria, but a full comprehension of the spoken language. Cranial nerves were intact. There was weakness and increased tone in all extremities. A conspicuous feature was a marked orofacial dyskinesia and dystonia of the extremities. There was moderate generalized hyperreflexia. No Hoffmann’s or Babinski’s. Sensation and cerebellar functions were normal. There were no meningeal signs.

General physical examination and vital signs were normal. CBC and routine chemistry profile were normal. A CSF study was also normal.

The EEG showed an electrographic seizure in the right temporal region during sleep (Fig. 1), which corresponded to an isolated MRI lesion in the deep white matter of the right temporal region (Fig. 2). In addition, the MRI showed abnormalities consistent with BRBGD (Fig.2).

Based on the available data, we made the diagnosis of BRBGD and successfully treated the patient with a combination of biotin and thiamine.

Case 2

The patient is a 3-year-old Saudi male who was admitted to the hospital with a rapid onset of weakness of the lower extremities followed by weakness of the upper extremities. The symptoms started 3 days prior to admission following a mild back injury. There was no sphincter dysfunction. The patient had a history of non-progressive speech delay.

Family history was significant in that the parents were consanguineous. The neurological examination showed normal cognitive development for age except for a mild speech delay. Cranial nerves were intact. Initially, he had weakness, hypotonia, and hyporeflexia in all extremities, and which in a few days evolved into increased weakness and tone along with hyperreflexia. General physical examination and vital signs were normal. Systemic metabolic work up and CBC were normal. An EEG (awake and sleep) was within the range of normal variation for the patient’s age. An MRI study was consistent with BRBGD (Fig.3).

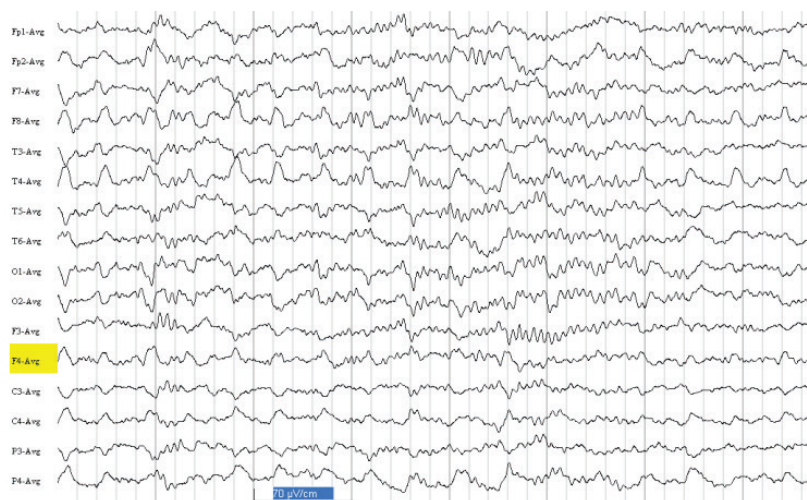


Figure 1: The EEG showed an electrographic seizure in the right temporal region during sleep.

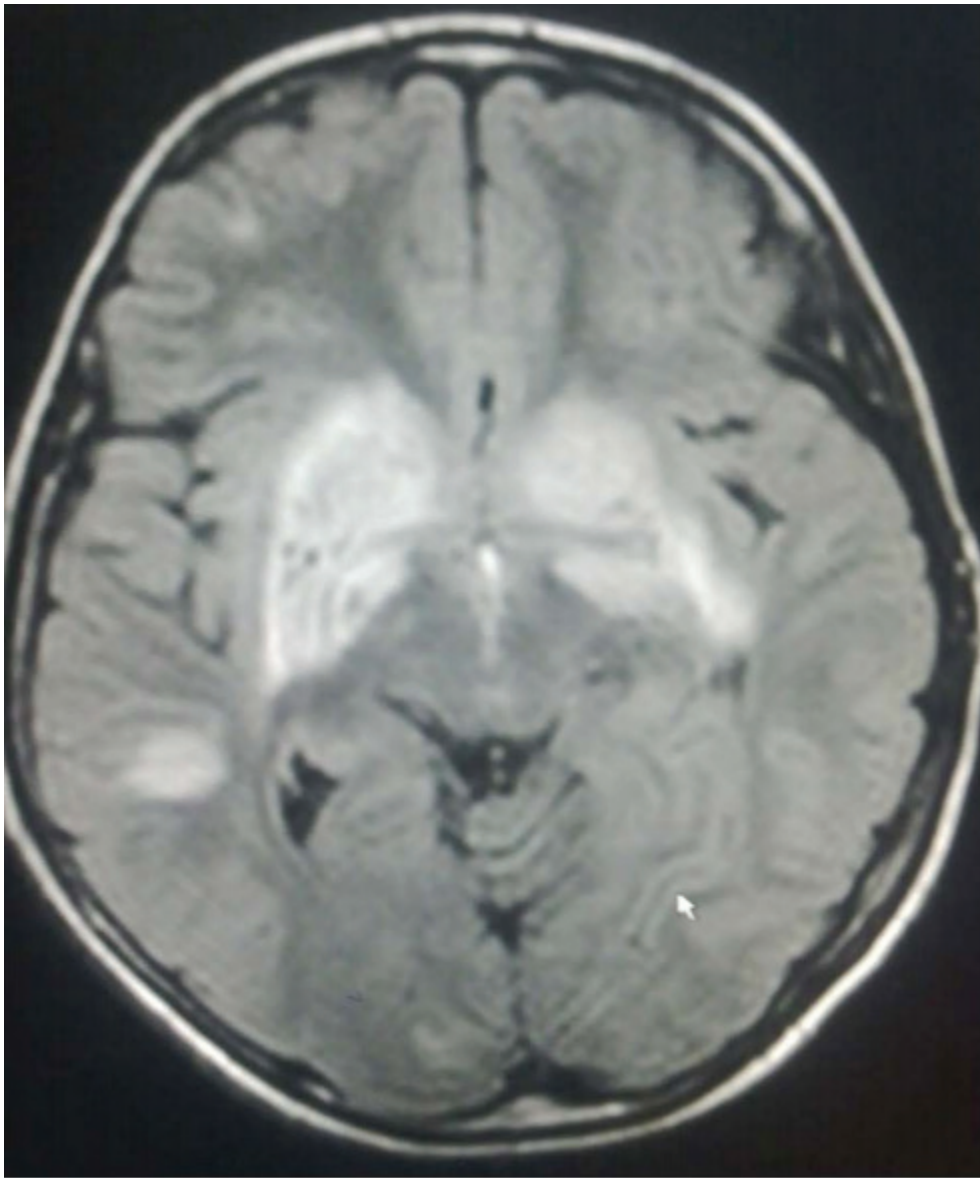


Figure 2: MRI T2 image: Bilateral hyper-intense signals involving the basal ganglia and the thalamus. Additionally, multiple cortical-sub-cortical hyper-intense lesions are present in the frontal and parietal lobes bilaterally. Note the focal hyper-intense

Table 1: EEG findings and seizure types in BRBGD (literature review)

Author	Patient	EEG	Seizure Type
Ozand et al. 1998	12	Normal background (2 patients) Diffuse background slowing (1 patient) Regional (anterior) slowing (1 patient)	Generalized convulsive (4 patients)
Debs et al. 2009	2	Diffuse background slowing (1 patient)	Simple partial with secondary generalization (1 patient) Generalized convulsive (1 patient)

Cont... Table 1: EEG findings and seizure types in BRBGD (literature review)

Yamada et al. 2010	4	Anterior-dominant spike-wave and polyspike-wave complexes (1patient) Multifocal spikes (1 patient)	Atypical infantile spasms
Alfadhel et al.2013	18	Not available	Partial or generalized (13 patients)
Stremba et al.2014	1	Burst-suppression + multifocalepileptiform discharges (1 patient); evolved into hypsarrhythmia with further evolution into LGS	Atypical infantile spasms

Discussion

In this article, we describe two children who presented with a sub-acute onset of weakness of extremities, dysarthria, and in one case extra-pyramidal symptomatology. The MRI of the brain was consistent with BRBGD. Although, we have no genetic confirmation of this diagnosis, we excluded BRBGD mimics. Among those, Leigh syndrome, a mitochondrial disorder primarily affecting infants, which is a progressive and eventually fatal disease. Similarly, organic acid disorders occur in infancy, and not in older children. Toxic encephalopathy was ruled out by the absence of a history of exposure to environmental hazards. Moreover, urine screening for heavy metals was negative. We ruled out CNS vasculitis by the absence of fever and headaches, unremarkable systemic examination, a normal ESR, a negative CRP, and a non-focal MRI. The mode of onset and the course of illness were inconsistent with Wilson's disease. Intact sensorium and normal extra-ocular muscles are incompatible with Wernicke's encephalopathy. Acute demyelinating encephalomyelitis (ADEM) was deemed unlikely because of a lack of antecedents (I.e. infections), and a paucity of white matter abnormalities on the MRI along with a preponderance of gray matter involvement. Finally, the MRI was inconsistent with childhood multiple sclerosis. The dramatic and sustained response of our patients to a combination of biotin and thiamin is the best evidence that the diagnosis was indeed BRBGD.

Since the original description of BRBGD by Ozand et al.¹, there have been several studies of this syndrome, some of which reported EEG findings and seizure types

in their cohorts (Table1). The EEG background activity has reportedly ranged from normal to diffusely slow, with occasional regional slowing or suppression-burst pattern. The reason for such variations is not immediately apparent, although it is conceivable that each variation may represent a specific phase of cerebral involvement within the spectrum of BRBGD. Similar "variations" have been reported in other encephalopathies, and where they have served as the cornerstone of EEG classification systems designed for therapeutic monitoring and prognostication⁸⁻⁹. Our patient 2 had a normal background activity despite severe neurological and MRI abnormalities, indicating a lack of concordance between the EEG and MRI in this syndrome (electro-anatomical dissociation).

Similar to some unrelated encephalopathies¹⁰, an "electro-clinical" dissociation exists in BRBGD, including in the group with seizures. For example, the EEG of our patient 1 showed a focal electrographic seizure in the right temporal region (corresponding to a deep right temporal lobe lesion on the MRI) without discernible peripheral manifestations. Conversely, some of the patients reported in the literature had clinical seizures without documented epileptiform discharges in the EEG, with the exception of patients with BRBGD-induced infantile spasms. It is notable that in one previous case report⁴, the patient developed infantile spasms, which later evolved into Lennox-Gastaut syndrome. Thus, BRBGD should be considered as a potential etiology for West's syndrome and Lennox-Gastaut syndrome.

The electrographic seizure in patient 1 occurred only during sleep, signifying the importance of sleep EEG in patients with BRBGD. A review of the literature reveals the occurrence of several seizure types in BRBGD including focal and generalized convulsive seizures. In the patients with infantile spasms (4, 7) myoclonic seizures as well as axial tonic spasms were described. By-and-large, seizures are triggered by the underlying metabolic disease, however, when associated with focal EEG discharges (vide supra), they may raise the possibility of focal pathology.

At this time, it is not clear whether in the event of a seizure activity complicating BRBGD, anticonvulsants (AEDs) should be prescribed and if so, for how long. Is it necessary to prescribe AEDs prophylactically in cases where focal or generalized epileptiform discharges persist in the EEG? Importantly, these issues are confounded by the fact that pathological findings on the MRI usually persist well beyond clinical recovery. These questions remain to be answered until more data become available.

It should be noted that we did not obtain serial EEGs in our patients to assess the evolution of the encephalopathy, primarily because of the patients' rapid response to vitamin therapy.

In summary, further investigations are necessary to determine the significance of the EEG, in particular, serial EEGs in the diagnosis and prognostication of BRBGD. Perhaps, on a larger scale an EEG classification system could be developed to optimize care in this rare, life-threatening, yet reversible condition. Such a study would, of course, require an international, multi-center, collaborative effort to address this manifold topic.

Conclusion

1- The data suggest both electro-clinical and electro-anatomical dissociation in BRBGD. 2-Seizures in BRBGD are primarily caused by the underlying metabolic encephalopathy, although focal epileptiform discharges may signify a homotopic focal cerebral pathology caused by BRBGD.

Ethical Clearance: Taken from Continuing Medical Education & Research Center.

Source of Funding: Self, This work was not supported by any grant or funding source.

Conflict of Interest: Nil

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The Effect of Early Mobilization with Elastic Band Exercise on the Duration of Mechanical Ventilator Weaning of Critically Ill Patients.

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Abstract

Objective The purpose of this study was to investigate the effect of early mobilization with elastic band exercise on the duration of mechanical ventilator weaning in the patient in intensive care unit (ICU).

Methods: Seventy-five ICU and Sub ICU patients were recruited and randomly assigned to a control group (C) and an intervention group including early mobilization (EM) for control group and early mobilization with elastic band exercise (EMEB) for intervention group. The primary outcome was the duration of mechanical ventilator weaning in ICU. The secondary outcomes were the strength of the arm muscle measuring by the handgrip strength, and functional class level.

Results The all groups were not significant in a severity-of-disease classification system of ICU-scores. EM and EMEB were significantly reduced the ventilation duration and functional class level in ICU. Nevertheless, EMEB was significantly increased the strength of the arm muscle with a hand grip dynamometer compares with EM group ($p < 0.05$). EMBM was significantly decreased the ventilation duration in ICU and increased handgrip strength, and level of physical activity ($p < 0.05$). Thus, EMBM may be applied using treatment in ICU.

Key words: Early mobilization, ICU, elastic band exercise, weaning, mechanical ventilator

Introduction

The illness patient who have breathing problems such as the Acute Respiratory Distress Syndrome (ARDS), heart disease, lung disease and other diseases such as pneumothorax, pneumonia, etc. Patients with breathing problems require necessary on ventilator. The immobility leads to a number of complications including pneumonia, joint stiffness, neuromuscular weakness and muscle weakness which lead to difficulty weaning¹⁾²⁾,

increased duration of mechanical ventilation and length stay in hospital³⁾. These lead to poor the quality of life⁴⁾, thus there should shorter duration on ventilator. In some cases, there would some complications in treatment. Some studies reported that 12.5%—patients with polyneuropathy and/or myopathy require prolonged immobilization⁵⁾. Two weeks later immobilization, the muscles are weakness about 20-27% lead to difficult weaning and loss function. Therefore, the team of doctors, nurses and physiotherapists are necessary to cooperate in the treatment of patients so that they were extubation the ventilator as soon as possible in order to return in order to divorce the device more quickly to be restored the physical ability of patients to return to

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normal daily life activity. In the field of physical therapy it is necessary to take other approaches for preventing complications, improving lung rehabilitation and circulatory system. There are traditional therapeutics or conventional program including, lung therapy techniques, pulmonary shaking, breathing exercises, coughing training, active exercise, chest mobilization etc. There are many studies about the effects of pulmonary physiotherapy on ventilating weaning⁽⁶⁾⁷⁾⁸⁾. In addition, other treatments, such as early mobilization (EM), have reported studies that can reduce the weaning time of patients⁽⁹⁾¹⁰⁾. Elastic band exercise⁽¹¹⁾ is an interesting method because it is beneficial to exercise in many of patients condition for improving muscle strength and exercise is beneficial to maintain muscle mass⁽¹²⁾. However there was no evidence conducting the combine EM and elastic band exercise in ICU. Thus, this research was interested to study the effect of early mobilization (EM) in combination with elastic band exercise on the duration of ventilator weaning in hospital.

Methods

Participants

A total of 75 ventilator-dependent patients were randomly assigned and divided into 3 groups, based on the sample size calculation of Schweickert *et al.*⁽¹³⁾ with G-power program to achieve statistical significance at $p < 0.05$ and power $> 80\%$. Twenty Five patients in each groups including, the first group was considered as control group (C group) that received conventional treatment, the second group received—EM protocol treatment (EM group) and the third group received EM protocol treatment with elastic band exercise (EMEB). The inclusion criteria⁽¹⁴⁾¹⁵⁾, for 75 patients—considered those who were on ventilation for at least 72 hours and had a hemodynamic stable, regardless of gender, aged over 18 years and physicians consult with physical therapy. The communicators understood Thai and cooperated in providing treatment. Physiologically stable were with $< 50\%$ variation in resting heart rate (HR), systolic blood pressure (SBP) < 200 mmHg or > 90 mmHg, peripheral oxygen saturation (SpO_2) $> 90\%$, fraction of inspired oxygen (FiO_2) $< 60\%$, respiratory rate (RR) < 25 breaths per minute. In addition, the patients didn't have invasive femoral arterial lines and were not receiving treatment with a no physical exercise program were included in

this study. The exclusion criteria were a pregnancy, obesity ($BMI > 40$ kg/m²), musculoskeletal diseases such as myasthenia gravis, Guillain-Barré syndrome, vascular diseases such as lupus erythematosus, broken bones or skin ulcers (such as burns) and metastatic lung disease, acute traumatic brain injuries, the neuro-deficit condition, cognitive dysfunction and coma, and on pacemakers. The data were collected at Maharaj Nakorn Chiang Mai hospital before and after treatment and evaluated the parameters as follows; assess the severity of the disease with the Sequential Organ Failure Assessment (SOFA) Score, the strength of the arm muscle with a hand grip dynamometer and the levels of physical activity.

Assessed the severity of disease classification in patients with SOFA

The score is presented in the estimate mortality (%)⁽¹⁶⁾. Discussion with results included drugs, electrolytes, physiological profiles etc. The SOFA Score were calculated as described previously⁽¹⁷⁾¹⁸⁾¹⁹⁾.

Assessed the strength of the arm muscle with a hand grip dynamometer

A hand grip dynamometer was measured in kilograms. The hand-grip dynamometry is a standard device that measures and indicates the strength of the arm muscles as a whole, which has been high reliability and validity⁽²⁰⁾²¹⁾. The patients were undertaken the maximally squeeze, hard the handle of the dynamometer with their dominant hand for 3 seconds and then relax. They were performed three trials and record as the mean.

Assessed the level of physical activity followed as the EM treatment protocol

The level of physical activity has 4 levels as the EM protocol standard care⁽²²⁾. The level 1 is passive ROM. The level 2 is passive ROM, active ROM, and sitting position minimum 20 minutes. The level 3 is passive ROM, active ROM, sitting position minimum 20 minutes and sitting on edge of bed. The Level 4; Passive ROM, active ROM, sitting position minimum 20 minutes, sitting on edge of bed, active transfer to chair minimum 20 minutes.

Treatment program

A total of 75 patients were randomized into 3 groups. The first group was treated with traditional therapy. Conventional physical therapy groups included passive and active range-of-motion exercise (ROM), breathing exercise, 5 times in a week. The second group is treated with traditional therapy and receiving EM protocol. The third group receiving treated with traditional therapy and receiving EM protocol together with elastic exercise²³⁾ in diagonal pull, shoulder flexion, flyer and reverse flyer postures, 10 times 3 sets, once a day, 5 times a week, each. The group took about 30 minutes to treat each time and provided treatment 5 days in a week, with patients having physiological responses (oxygen saturation, heart rate, and blood pressure) to ensure the normal and safety. The exercise with EM protocol is determined in according to assessed the level of physical activity as EM protocol that was follow by Berry & Morris²⁴⁾.

Statistical Analysis

The obtained values are presented in the form of mean and standard deviation display general patients information in averages format. The normal distribution was analyzed by using Kolmogorov-Smirnov Goodness of Fit Test. Compare variables between 3 groups before and after the Repeated Measurement with ANOVA

statistical level at 0.05 using the program used in data analysis, SPSS.

Results

Baseline patient characteristics.

A total of 75 patients were enrolled in this study. The patients were recruited and randomly assigned to a control group(C) and early mobilization group (EM) and early mobilization with elastic band exercise (EMEB). Each group was recruited 25patients. During treatment both control group and EM group had 2 dead patients from respiratory failure, thus control group and EM group had final success 23 patients according to Fig.1. The baseline characteristics of enrolled patients were showed as Table 1. The control group, EM group and EMEB group had aged 74.68±15.23, 69.08±16.96 and 75.32±14.28 years, respectively. Each group was not significantly in the ICU scores parameters including SOFA (score). The duration of MV (days) of the control group, the EM group and the EMEB group were 12.82±5.69, 5.78±2.74 and 6.52±4.40, respectively (Table 1). The EM group and the EMEB group were significantly reduced the duration of MV compared with the control group (p<0.05). These data suggested that the EMEB group could be reduced duration of MV.

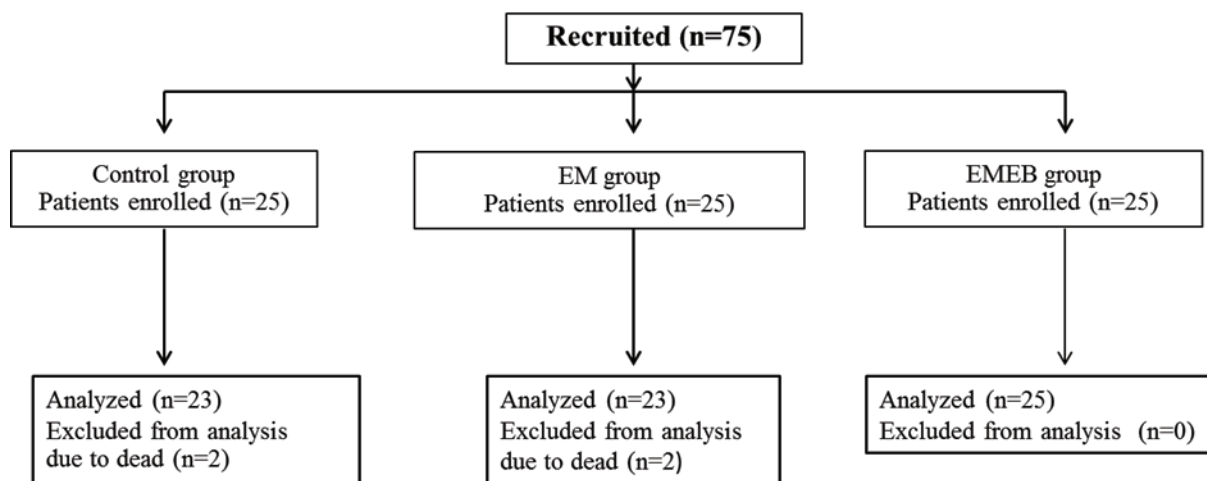


Figure 1 CONSORT Diagram depicting patient flow through the study

Table 1: Characteristic of study patients

Variables	Control group (n=23)	EM group (n=23)	EMEB group (n=25)
Age (years)	74.68±15.23	69.08±16.96	75.32±14.28
Sex(M/F)	15/8	11/12	7/18
ICU-scores at enrollment -SOFA	5.20±3.01	5.12±2.29	5.68±2.36
Duration of MV (days)	12.82±5.69	5.78±2.74*	6.52±4.40*

*P< 0.05 compared to control, # compared to EM group, \$ compared to pre-treatment group

The hand grip strength (Kgs) and the levels of physical activity.

The result showed the hand grip strength (kgs) and the levels of physical activity in each group as Table 2. EMEB (changed 3.53±1.42 kgs) showed significantly increased hand grip strength compared to control groups (changed 0.97±1.21kgs) (p<0.05). The both EM group and EMEB group were significantly improved the level of physical activity compared to control groups (p<0.05). Post-treatment in all group were significance both the hand grip strength (Kgs) and the level of physical activity parameters compared to pre-treatment (p<0.05). These data suggested that EMEB was improved the hand grip strength (Kgs) and the level of physical activity of the patients in ICU.

Table 2: The hand grip strength (Kgs) and the level of physical activity

Variables	Control group(n=23)			EM group (n=23)			EMEB group (n=25)		
	Pre	Post	changed	Pre	Post	changed	Pre	Post	changed
Hand grip strength (Kgs)	6.02±8.22	6.64±8.78\$	0.97±1.21	6.55±5.80	9.34±6.62*, \$	2.79±1.93*	7.16±5.02	10.69±5.70 *, #, \$	3.53±1.42*, #
Levels of physical activity	1.04±0.36	1.96±0.46\$	0.92±0.41#	1.24±0.52	2.80±0.71*, \$	1.56±0.58*	1.5±0.66	3.21±0.72*, #, \$	1.71±0.62*, #

The data are presented as mean ± SD.

*P< 0.05 compared to control, # compared to EM group, \$ compared to pre-treatment group.

Discussion

The aim of this study was to investigate the effect of early mobilization with elastic band exercise on the duration of mechanical ventilator weaning in the patient in a medical ICU. After treatment this program with conventional program as control group, early mobilization (EM) and elastic band exercise (EMEB), we found that all the patients in EM (n=23) and EMEB (n=25) were interacted with physical therapy team could significantly decreased the MV duration compared with conventional group ($p < 0.05$). Lai and et al. showed that early mobilization of patients in the ICU make the MV durations shorter in the ICU. Moreover, Dantas *et al.*²⁵⁾ found significant improvement of the maximal expiratory pressure or MV duration (days), length of stay in the ICU and peripheral muscle strength. Thus, EM had many report benefits for patients on mechanical ventilation (MV) and shown to improve outcomes after critical illness in ICU²⁶⁾. In addition, we found that an elastic band exercise program with EM (EMT) in a critical ill patient was also improving both shorter MV durations and dominant-hand grip muscle strength more than EM and conventional program. Polastri *et al.*²⁷⁾ reported a case who was a 72-year-old male with hypoxemic respiratory failure in ICU used elastic band in the directions including abduction, forward flexion, and external rotation of upper limb. They found that elastic band exercise improved trunk control and upper limb motor activities. The elastic-band resistance exercise is also easier instrument using and many effects on increased balance, gait function, flexibility, fall efficacy in elderly people²⁸⁾ and the shoulder stabilizing muscles²⁹⁾. Cancela *et al.*³⁰⁾ showed the effects of exercise programs on people older than 80 years with elastic-band program resulted significantly improvements in strength which assessed by hand-held dynamometer. The dominant-handgrip strength may be good predictor for duration of MV, extubation outcome, ICU mortality and prognosis³¹⁾. EMEB also showed improvement of muscle strength handgrip. However, EM group had not significant hand grip compared to control group according to Zang *et al.*³²⁾. The early mobilization improved the clinical and functional recovery of patients in ICU³³⁾ according to in this study showed both EM and EMEB improved the functional rehabilitation level significantly compared to control group. Yasuda *et al.*³⁴⁾ reported that after low-intensity

elastic bands exercise improved the muscle activation progressively and promoted level of activity in older adults or patients. Thus, EMEB improved the shorter MV durations, the dominant-hand grip muscle strength and physical activity level in the ICU.

Limitation

This study has some limitations. This study not followed after refer to other ward. Therefore, the possible confounding factor should be is still warranted to confirm our findings.

Conclusion

These findings suggest that the EMT, which is usual for rehabilitation programs for critical illness in ICU and improves weaning success and reduced the ventilation duration. Moreover, EMT improves the strength of the arm muscle and rehabilitation functional class level. Thus, EMBM can be improved the clinical outcomes of patients with MV in ICU.

Conflict of Interest: The authors declare no conflicts of interest.

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Ethical Clearance: The study was approved by the Ethics Committee at Faculty of Medicine, Chiang Mai University (NONE-2562-06116).

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Factors Causing the Low Compliance of Condom Use in Prostitutional Customers in Embong Miring, Probolinggo, Indonesia

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Abstract

Until now, the problem of covert prostitution is difficult to solve because it cannot be controlled by the nearest health service. This is likely because it is difficult to detect the presence of female sex workers who do not claim their profession when the data collection is done by the Social Service. This causes the incidence of STIs (sexually transmitted infections) continues to increase and it is difficult to prevent transmission of the STI disease. The highest STI cases, based on data from the Ministry of Health of the Republic of Indonesia with a syndrome diagnosis approach and laboratory examinations according to risk groups for 2016-2018, suffered by female sex workers as many as 93,798 cases. An increase in STI cases among female sex workers shows that condom use among customers is still low. This is likely related to less negotiations with customers during sexual transactions. Prevention of STI transmission can be done by adhering to customers to always use condoms during sexual intercourse. This research was conducted to find out how the ability of female sex workers to negotiate with customers about the use of condoms in every sexual transaction they do. This research uses descriptive research with a qualitative approach. The research design was in the form of case studies and sampling in this study by purposive sampling. The informants in this research are female sex workers, the research instrument uses a list of interviews and in-depth interviews. The results showed that the ability of female sex workers to negotiate with customers about the use of condoms is still a lot of bargaining because female sex workers are tempted to pay more if customers' requests not to use condoms are fulfilled. This study concludes that the role of the economic needs of female sex workers is very important and also influences the ability to negotiate with customers about the use of condoms.

Keywords: *female sex workers, condom, economic needs.*

Introduction

Sexually transmitted infections (STIs) are a serious problem in the world because the number of cases of this disease continues to increase every year. Its development is very fast because it is associated with accretion, population migration accompanied by increasingly free patterns of sexual behavior, and demographic changes in the religious and moral fields which are declining, causing an increase in the incidence and prevalence of STI cases¹. Women Sex Workers (FSW) are women

who work to sell or rent their bodies for pleasure and to satisfy the sexual needs of customers by expecting a reward or wage. Many women live in poverty or those who come from low economic families for various reasons they take shortcuts to get money to meet their needs with their families, so they choose to become FSW. This is also due to the low education factor which makes it impossible for them to get a job with enough income.

Female sex workers usually have other professions in certain occupations or have other main occupations and indirectly peddle sex like those in a dimly lit shop. They operate in disguise by serving as stall servants who simultaneously offer themselves to customers who come to the stalls. The FSWs are considered as jobs that

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involve considerable vulnerability and are at high risk of transmitting STIs to the public through their customers. Apart from being a high-risk group affected by STI, FSW also has an important influence in the spread of this disease². Therefore, prevention efforts that WPS can do when sexual transactions with their customers are needed so that the ability of FSW to negotiate with customers about condom use is very important for terminating the spread of STIs.

Based on data from the Indonesian Ministry of Health, from 2016 to 2018, the highest number of STI cases among female sex workers (93,798 cases) were followed by high-risk partners (84,026), gay (46,278), and customers of commercial sex workers (16,709)³. The approach used to identify STIs used by the Indonesian Ministry of Health is a diagnostic approach based on syndromes and laboratory examinations. The Central Bureau of Statistics of East Java Province in 2017 recorded the number of patients with STI reaching 3,931 cases and for Probolinggo District as many as 56 cases⁴.

Food stalls in Embong Miring, Probolinggo Regency have been around since 1967 and it is well known that there provide female sex workers who can meet the sexual satisfaction of their customers. Until now, female sex workers in the area are not controlled by the social services and health services in Probolinggo Regency. Thus, STI transmission to the public through customers cannot be controlled and this also happened in other prostitution center^{5,6,7}. One of the factors that influence the spread of STI disease in Embong Miring is one of them due to the lack of compliance of customers to use condoms. This is because there are still many bargains made by customers against FSW not to use condoms with the lure of greater pay. In addition, FSWs are unable to negotiate using condoms to customers because they are interested in getting more money by agreeing to customers' requests not to use condoms in sexual relations. The researcher wanted to find out how the FSWs were able to negotiate with customers to use condoms for each of their sexual transactions.

Methods

Design

The method in this study uses a qualitative descriptive approach⁸. The research design was in

the form of case studies and purposive sampling. The sample is chosen from one member of the population that can represent the population which can be seen from the similarity of the characters possessed. In this case the researchers made observations related to the negotiating ability of female sex workers to customers about the use of condoms by means of in-depth interviews with FSWs.

Informant

In this study, researchers selected five female sex workers in Embong Miring who had worked for about three years. Researchers chose the informant because they have long worked as FSW and have served many customers. Researchers took data by conducting in-depth interviews with each FSW to explore information in a group of subjects. Determination of informants by purposive sampling that has the characteristics and characteristics in accordance with the objectives of the study.

The study was conducted at each food stall that was indicated to provide sexual services that had previously gone through the licensing process by considering the time, cost, and research staff. Before taking, the researcher gave informed consent to each informant as a form of agreement. During the interview process, the researcher takes notes based on real situations and events and overrides personal perceptions.

Data Collection Procedure

In this study, researchers used interview guides in an open and relaxed manner. The researcher asked permission from the informant to record using a cellphone during the interview process. The researcher records all the answers from the informant as they are the answers given by the informant. Occasionally researchers at the interview ask for confirmation of answers to ask for an explanation or to confirm or straighten out if there are answers that are still unclear. The interview process takes approximately 60 minutes and interviews in this study can be stopped when the required information has been obtained in accordance with the research objectives.

Data Analysis Procedure

The qualitative data analysis⁸ process is as follows:

- The process of taking notes that produces field

notes, with it coded so that the source of the data can still be traced.

- Then, gathering, sorting, classifying, and synthesizing, making summaries, and indexing.
- Thinking that data categories have meaning, look for and find patterns and relate them.
- Make general findings.

Based on data analysis explained, this study uses an analysis with four stages. The data that has been collected is made in a matrix and will be presented with descriptive data based on the events or experiences of the informants. Conclusions were also verified during the study. Conclusions are drawn when researchers compile notes, patterns, questions, configurations, directions, cause and effect, and various propositions⁹.

Results

Of the total female sex workers in Embong Miring, only 15% are from Probolinggo Regency. Most of the FSW came from outside Probolinggo Regency, namely from Jember, Lumajang, and some from Kalimantan and Solo. The sex shop in Embong Miring is concealed as a coffee shop and is known as a haven of prostitution in Probolinggo District because the coffee shop that is opened at the place employs women as servants, and they also provide plus-plus services in the form of commercial sex services.

The shop, which opened from 08.00 WIB until 17.00 WIB, was frequently visited by customers who were mostly drivers and kernet who crossed the Tegalsiwalan area which is the main route leading to Lumajang, Jember, and Banyuwangi. The FSWs in the Embong Miring stalls did not settle in these stalls, but instead they came in the morning and returned home in the afternoon. Based on what was conveyed by the informant was as follows:

“If I come every day, I go to the stall every morning sometimes at half past seven, and sometimes yes at eight o’clock, transfer by a motorcycle taxi, then if the stall is closed, then go home. At the latest, at five in the afternoon the shop is closed. So, if it’s closed, then I’ll go home. “

The FSW in Embong Miring every day serve two

to four customers, most of which are only short time. Based on the opinion expressed by the informant, it can be concluded that the FSWs only serve short time just like what informants say are as follows:

“Yes, the average customer who comes only briefly, enters the room when it is finished yes has gone out immediately”.

The transaction process between FSW and customers takes place very briefly because the customers and FSW already know that the commercial sex services in Embong Miring operate from 08.00 WIB to 17.00 WIB so that the customers who come have a clear goal, namely to vent His sexual desires like what was conveyed by the informants are as follows:

“If they come, we are scrambling to come to the customer, then the customer who chooses, after choosing a new bargaining price, if the transaction has agreed, then immediately enter the room”.

The process of negotiating the use of condoms is done after the customer chooses the FSWs who will serve them and is done at the time of bargaining for the FSW price as what the informant has said is as follows:

“If the price has been agreed, then I say that condoms must be used, sometimes are there also customers who disagree and offer double the price? Then I observe, if the person is clean, yes, I want to, if the person looks dirty and does not look like a bath, I don’t want to, afraid of getting sick”.

The second informant gave the following statement:

“Customers who come here already understand that they must use condoms, but sometimes there are those who negotiate not to use condoms, then they offer me more pay, I first see the person, if I know the person, yes I accept the offer But if the customer is a new person, I don’t want to, I am afraid because I don’t understand what the person is like “

Discussion

Female sex workers who work in Embong Miring food stall have different backgrounds. Some are widowed and many are single, and with diverse ages between 20-38 years. They work in Embong Miring with different histories that are basically due to economic needs,

because they are the backbone of the family and the lack of skills they have so it is difficult to get a decent job with sufficient results. Because they work like ordinary employees, ie come in the morning and go home late in the evening, then their family does not know their work. There are not many FSWs in Embong Miring, in one food stall there are three to five FSW people, so that in one day they can serve two to four customers. The Embong Miring stalls are located on the edge of the road that is traversed by road users to Lumajang and its surroundings so that many truck drivers or other road users stop by the stall. FSWs in Embong Miring are recommended to come to the puskesmas every three months to check for STIs and HIV/AIDS. Customers who come to Embong Miring stalls while they drink coffee also observe which FSW they want to choose to serve their sexual desires. After one of them is chosen, they communicate to bargain the price as stated by the first informant (1).

At the time of the bargaining, the FSWs had conveyed the agreed price to use condoms. So, FSWs do not need to seduce or explain again about the use of condoms, because the agreed price must use a condom, but if there are customers who do not want to use a condom they usually offer a price that is more than the result of the previous price agreement as stated by the first informant. Then, FSWs usually approve the request because they need money, especially if they are already familiar with their customers as what has been conveyed by the second informant. Thus, it can be concluded that due to economic factors and the closeness of FSW to customers there is no compliance with the use of condoms when they have sexual relations. Because of this, prevention of STI transmission cannot be done^{10,11}. Compliance with the use of condoms in Embong Miring stalls depends on the customers who come because basically the obligation or obligation to use condoms has been carried out but if there are customers who bid or refuse to use condoms can be bargained and the results depend on the price agreement because agree or not depends on FSW due to economic factors and the demands of life needs that influence their decisions^{12,13}.

Conclusion

This study showed that the ability of female sex workers to negotiate with customers about the use of

condoms is still a lot of bargaining because female sex workers are tempted to pay more if customers' requests not to use condoms are fulfilled. Also, this research concludes that the role of the economic needs of female sex workers is very important and also influences the ability to negotiate with customers about the use of condoms.

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Ethical Clearance

Ethical permit for this research issued by the Health Research Ethical Clearance Commission, University of Airlangga, Surabaya, No. 137/HRECC.FODM/III/2020.

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Risk Factors of Bacteremia in Children with Community Acquired Pneumonia

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Abstract

Background: Pneumonia is the leading cause of infectious death in children worldwide. Community Acquired Pneumonia (CAP) is pneumonia obtained in communities where bacteria are the most common cause in children. Bacteremia accompanied by pneumonia has the potential to threaten life in children but the risk factors for bacteremia with pneumonia are not yet clear.

Objective: To study the risk factors of bacteremia in children with CAP

Methods: This was a case control observational study used pediatric inpatient medical records from January 2014-December 2018

Results: There were 275 subjects who met inclusion and exclusion criteria and 45(16.4%) of them had positive blood cultures. Therefore, 90 subjects were included in this study with a mean (\pm SD) age of 23.57(\pm 43.28) and most of them were male (60%). *Klebsiella pneumonia* was the causative pathogen of most cases (22.2%). In bivariate analysis, it was found that malnutrition (OR 35.2; 95% CI 4.45-278.25; $p=0.000$), congenital heart disease (OR 6.83; 95% CI 2.09-22.4; $p=0.001$) and hematological disease (OR 12.57; 95% CI 1.54-102.97; $p=0.004$) were the risk factors of bacteremia in children with CAP. Meanwhile, multivariate analysis showed only malnutrition that had relationship with bacteremia in children with CAP (Exp(B) 0.027; CI 95% 0.003-0.231; $p=0.001$)

Conclusion: Malnutrition was significant risk factors of bacteremia in children with CAP

Key words: *Pneumonia, Community-Acquired Pneumonia, bacteremia, risk.*

Introduction

Community Acquired Pneumonia (CAP) is defined as an acute symptomatic lower respiratory tract infection (LTRI) in patient outside hospital or long-term treatment facilities with new pulmonary infiltrates¹ and majority are caused by bacteria.² Pneumonia is a leading cause

of death of infectious diseases in children throughout the world and contributes around 15% of all deaths of children under 5 years old.³ In Indonesia, the 2014 Sample Registration System results stated that pneumonia was the 3rd leading cause of death in children under five in Indonesia, amounting to 9.4% of the number of under-five deaths.⁴ Pneumonia with bacteremia is life threatening for children² and children under five years old have a greater incidence of bacteremia.⁵ The previous study conducted in Surabaya reported that the incidence of bacteremia in children with pneumonia varies from 4%-18%.² Bacteremia can lead to septicemia with a high mortality rate that varies between 30-70% depends on several factors, such as pathogenic virulence and host factors.⁶ There are still uncertainties about risk factors

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that affect bacteremia in pneumonia.⁷ By knowing these risk factors, it is expected that health professionals can quickly and accurately identify and provide prompt management and evaluation to reduce mortality and morbidity of pneumonia. Therefore, this study aim is to study risk factors of bacteremia in children with CAP.

Methods

This case control observational study conducted in Dr. Soetomo General Hospital, Surabaya, Indonesia. This study used pediatric medical records who were diagnosed with CAP clinically period of January 2014-December 2018. The inclusion criteria were children aged 1 month old–18 years old, diagnosed with CAP based on WHO criteria, confirmed by chest radiography,⁸ and underwent blood culture within 48 hours after hospital admission. The subjects whose incomplete medical

records and the blood culture showed fungal infection were excluded. The subjects were divided into case group and control group. Case group, who had positive blood culture. Control group consisted negative blood culture. Matching was done based on age with case groups. After age grouping, subjects for control group were chosen randomly at ratio of 1:1 to the number of subjects from case group. Those data were collected as risk factors: age, sex, low birth weight, prematurity, and comorbid diseases such as malnutrition,^{9,10} congenital heart disease, neuromuscular diseases, hematologic disease, and HIV (Human Immunodeficiency Virus) infection. After all data collected, bivariate analysis would be performed on each risk factor by Chi-square and the risk factors which had p value<0.25 would be further analyzed by logistic regression. All analysis was

Table 1. Characteristic of Subjects

Characteristic of Subjects	Case Group (N=45) N(%)	Control Group (N=45) N(%)
Age <3 months old	12 (26,7)	12 (26,7)
3 months-1 year old	18 (40,0)	18 (40,0)
>1 year old	15 (33,3)	15 (33,3)
Sex Male	30 (66,7)	24 (53,3)
Female	15 (33,3)	21 (46,7)
Low Birth Weight	8 (17,8)	8 (17,8)
No	37 (82,2)	37 (82,2)
Premature	5 (11,1)	5 (11,1)
No	40 (88,9)	40 (88,9)
Nutritional Status		
Severe malnutrition	9 (20,0)	1 (2,2)
Malnutrition	11 (24,4)	0 (0,0)
Normal	25 (55,6)	44 (97,8)
Comorbid diseases	35 (77,8)	32 (71,1)
No	10 (22,2)	13 (28,9)
Malnutrition	20 (44,4)	1 (2,2)
No	25 (55,6)	44 (97,8)
Congenital Heart Disease	18 (40,0)	4 (8,9)
No	27 (60,0)	41 (91,1)
Hematologic Diseases	10 (22,2)	1 (2,2)
No	35 (77,8)	44 (97,8)

Cont... Table 1. Characteristic of Subjects

Neuromuscular Diseases	17 (37,8)	22 (48,9)
No	28 (62,2)	23 (51,1)
HIV	1 (2,2)	1 (2,2)
No	44 (97,8)	44 (97,8)
Lung infiltrates	40 (88,9)	40 (88,9)
No	5 (11,1)	5 (11,1)
Lung consolidation	17 (37,8)	18 (40,0)
No	28 (62,2)	27 (60,0)
Pleural effusion	5 (11,1)	2 (28,6)
No	40 (88,9)	43 (95,6)
Lung atelectasis	13 (28,9)	11 (24,4)
No	32 (71,1)	34 (75,6)
Anemia	19 (42,2)	15 (33,3)
No	26 (57,8)	30 (66,7)
Leukocytosis	21 (46,7)	20 (44,4)
No	24 (53,3)	25 (55,6)
Thrombocytopenia	8 (17,8)	8 (17,8)
No	37 (82,2)	37 (82,2)

Table 2. Profiles of Pathogenic Bacteria

Pathogenic Bacteria (N=45)	N(%)
Klebsiella pneumonia (ESBL+ 1 patient)	10 (22,22)
Staphylococcus aureus	8 (17,80)
Pseudomonas aeruginosa	5 (11,11)
Staphylococcus haemolyticus	4 (8,89)
Acinetobacter baumannii	3 (6,67)
Staphylococcus epidermidis	3 (6,67)
Micrococcus luteus	2 (4,44)
Streptococcus viridans	2 (4,44)
Escherichia coli (ESBL+ 1 patient)	2 (4,44)
Corynebacterium matruchotii	1 (2,22)
Klebsiella oxytoca ESBL+	1 (2,22)
Staphylococcus MRSA	1 (2,22)
Sternotrophomonas maltophilia	1 (2,22)
Brevibacterium sp.	1 (2,22)
Achromobacter sp.	1 (2,22)

Table 3. Bivariate Analysis of Risk Factors of Bacteremia in Children with CAP

Variables	OR	CI 95%	p
Age <3 months old >3 months old	1.000	0.393-2.546	1.000#
Sex Male Female	1.750	0.746-4.106	0.197#
Low Birth Weight	1.000	0.339-2.947	1.000#
Premature	1.000	0.269-3.724	1.000#
Comorbid Diseases	1.422	0.548-3.690	0.486#
Malnutrition	35.200	4.453-278.253	0.000*#
Congenital Heart Disease	6.833	2.084-22.402	0.001*#
Hematologic Disease	12.571	1,535-102,970	0.004*#
Neuromuscular Disease	0.635	0.274-1.470	0.635#
HIV	1.000	0.061-16.496	1.000#

*p<0.05 was considered statistically significant

#Chi Square test was used

(OR=Odd Ratio)

Table 4. Multivariate Analysis Model of Risk Factors of Bacteremia in Children with CAP

Variable	Exp(B)	CI 95%	p
Sex	0,344	0,112-1,051	0,061#
Malnutrition	0,049	0,005-0,478	0,009*#
Congenital Heart Disease	0,370	0,079-1,724	0,205#
Hematologic Disease	0,054	0,011-1,035	0,107#

*p<0.05 was considered statistically significant

#Logistic Regression test was used

Table 5. Multivariate Analysis Model of Risk Factors of Bacteremia in Children with CAP

Variable	Exp(B)	CI 95%	p
Malnutrition	0,027	0,003-0,231	0,001*#
Constant	4,020		0,004

* $p < 0.05$ was considered statistically significant

#Logistic Regression test was used

Abbreviations and Symbols

CAP	Community Acquired Pneumonia
CHD	Congenital Heart Disease
CI	Confidence Interval
HIV	Human Immunodeficiency Virus
WHO	World Health Organization

performed by IBM SPSS 21.

Results

There were 275 subjects who met criteria. There were 45 (16.4%) patients with positive blood culture results. Therefore, there were 90 subjects included with a mean (\pm SD) age of 23.57(\pm 43.28) months ranging from 1 month old to 15 years old. Most of them were male (60%) and had normal nutritional status (76.7%). Lung infiltrates were presented in majority subjects (88.9%). More than 40% of subjects from case group had anemia and leukocytosis (Table 1). The blood culture results showed 15 types of pathogens found. *Klebsiella pneumoniae* was the causative pathogen of most cases (22.2%) (Table 2).

The risk factors examined were listed in Table 3. In bivariate analysis, malnutrition (OR 35.2; 95% CI 4.45-278.25), congenital heart disease (OR 6.83; 95% CI 2.09-22.4), and hematologic disease (OR 12.57; 95% CI 1.54-102.97) were significantly associated with the occurrence of bacteremia in children with CAP ($p < 0.05$). The first step of multivariate analysis (Table 4) showed that only malnutrition that was associated with bacteremia in children with CAP and suitable for further analysis (Exp(B) 0.049; CI 95% 0.005-0.478; $p = 0.009$). Second step of multivariate analysis also proved that malnutrition significantly had relationship with bacteremia in children with CAP (Exp(B) 0.027; CI 95% 0.003-0.231; $p = 0.001$) (Table 5).

Discussion

The prevalence of bacteremia in this study was 16.4%. It was in line with previous study that stated

prevalence of bacteremia pneumonia patients ranging from 4-18%.¹¹ Lung infiltrates were found in most of subjects that had bacteremia (88.9%). Chest radiology findings are considered as “gold standard” to define pneumonia. However, there are wide variabilities in diagnosing CAP based on chest radiography due to inconsistent interpretation of plain chest radiography among doctors.¹²

More than 40% of subject that had bacteremia in this study presented anemia and leukocytosis. Anemia is one of comorbidity that increases the severity of pneumonia and poor outcome.¹³ Leukocytosis is conventionally thought to be associated with severe bacterial infection, but level of increase cannot be relied upon to distinguish between viral and bacterial pneumonia.¹⁴ This study found that *Klebsiella pneumoniae* was the most frequent causative bacteria. *Klebsiella pneumoniae* is frequently involved in severe infection and nosocomial infection. It is also proved as independent mortality risk factor in CAP and has high incidence in developing countries.¹⁵

This study found that age was not associated with bacteremia in children with CAP. Since age-matching method was used in this study to determine the control group, age could not be proven to be a risk factor of bacteremia in children with CAP. This study also found that sex was not associated with bacteremia in children with CAP. Some studies found that gender has no rule in bacteremia, but on the contrary other studies mentioned that male patients tend to be admitted in hospital compare to female patients,¹⁶ more frequently suffer from LRTI, more severe infection, and have higher mortality.¹⁷

This study found that LBW and prematurity had no relationship with bacteremia in children with CAP. It was in line with previous studies conducted in primary and tertiary health facilities in Surabaya, Indonesia that declared LBW was not associated with pneumonia, even in children under 5 years old.^{18,19} However, LBW babies tend to suffer from respiratory infection due to low immunity and lung disorders.²⁰ Premature babies are more vulnerable to severe bacterial infection due to lack of Immunoglobulin G that originally will be transferred from the mothers through the placenta in the following months.²¹

This study found that malnutrition was a significant risk factor of bacteremia in children with CAP and

independently increased the risk 35 times. These findings support the previous study conducted also in Dr. Soetomo General Hospital.² Pneumonia and malnutrition are known to be the two biggest killers of children.²² Malnutrition is also the most common risk factor for children with CAP in developing countries,⁵ described as mortality predictor of pneumonia in children,²³ increase the risk of mortality 2-3 times,²² and independently affects the mortality of under 5 years old children with pneumonia.²⁴ It was proven by studies that mentioned 55% of deaths among pneumonia patients to be malnourished children²³ and more than 95% of all new cases of pneumonia in children aged less than 5 years occur in developing countries due to the increased prevalence of malnutrition.²⁵ The increase in incidence and severity of infections in malnourished children is mostly due to a decrease in immune function, limited production and/or reduced functional capacity of all cellular components of the immune system.²²

Bivariate analysis in this study found that children with CAP and CHD were 6 times as likely to have bacteremia. Respiratory disease is most common complication of CHD in children, including pneumonia.²⁶ There is a close relationship between respiratory and cardiovascular system. Congenital anomalies of the circulatory system limit the heart's ability to increase systemic and pulmonary blood flow.²⁷ Bivariate analysis also found that children with CAP and hematologic disease had 12 times greater risk to have bacteraemia. Nevertheless, it was not proven by multivariate analysis. Lung infection including pneumonia is known as a common complication and a leading cause of death of haematological malignancies.²⁸

This study found that neuromuscular disease and HIV had no relationship with bacteremia in children with CAP. Patients with neuromuscular disease often develop inability to breathe deeply and cough effectively, and inability to effectively remove phlegm secretion that will lead to lung disfunction, increase airway resistance, and increase ventilation requirements.²⁹ Recently, bacterial pneumonia is claimed as the most frequent infection in children with HIV infection and there were 10-fold increase in incidence of bacterial pneumonia in children with HIV infection.³⁰

Conclusion

Malnutrition was significant risk factors of bacteremia in children with CAP.

Ethical Clearance: Approved by ethical committee of Dr. Soetomo General Hospital No 1496/KEPK/VI/2019

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Conflict of Interest: no

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Assessment of Pesticides Residues in *Moringa oleifera* Seed

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Abstract

The study investigated the concentration of pesticides in cotyledon and testa of *Moringa oleifera* collected from a garden in Ado-Ekiti. Gas chromatographic analysis was employed for the pesticides determination after careful extraction and florisil cleanup. The concentration ($\mu\text{g}/\text{kg}$) of pesticides in the cotyledon ranged from 0.031 (2, 4, 6-trichlorophenol) to 0.313 (oxamyl), while the testa ranged from 0.004 (pyriproxyfen) to 1.99 (cypermethrin). Oxamyl, cyanazine, fenvalerate, chlorpyrifos, aldrin and phosphine were the most concentrated pesticides with trend of cypermethrin > oxamyl > cyanazine > fenvalerate > phosphine > chlorpyrifos > aldrin. 55.9% of the pesticides had values in the cotyledon greater than the testa. Residual levels of these pesticides were below the maximum permissible limits set by the European Union (EU) Commission.

Keywords: *Moringa oleifera*, pesticides, cotyledon, testa, gas chromatograph.

Introduction

Moringa oleifera is a fast growing multipurpose woody plants which grow in diverse ecosystems¹⁻⁵, from very dry marginal lowland tropical climates to moist high altitude regions. They shed their leaves during long dry seasons. Their tuberous roots enable them to store water and withstand very long dry seasons. The *M. oleifera* tree can grow up to 5 ± 15 m in height, with a diameter at breast height up to 25 cm^{1-2} .

M. oleifera plant is used in different ways as; domestic cleaning agent (crushed leaves), blue dye (wood), fencing (living trees), fertilizer (seed-cake)⁶⁻⁷, foliar nutrient (juice expressed from the leaves), green manure (from leaves), gum (from tree trunks), honey- and sugar cane juice-clarifier (powdered seeds), honey

(flower nectar), medicine (all plant parts), ornamental plantings, bio-pesticide (soil incorporation of leaves to prevent seedling damping off), pulp (wood), rope (bark), tannin for tanning hides (bark and gum), water purification (powdered seeds). *M. oleifera* seed oil (yield 30-40% by weight), also known as Ben oil, is a sweet non-sticking, non-drying oil that resists rancidity. It has been used in salads, for fine machine lubrication, and in the manufacture of perfume and hair care products⁸. For Life organization, 'every part of the Moringa tree is said to have beneficial properties that can serve humanity'. In addition, the Moringa was found to have a group of unique compounds containing sugar and rhamnose, which are uncommon sugar-modified glucosinolates⁹⁻¹¹. These compounds were reported to demonstrate certain chemopreventive activity, by inducing apoptosis¹².

Different parts and preparations of MO have been reported to be used in traditional medicine and in the treatment of various conditions¹³. They are also used as nutritional supplement¹⁴⁻¹⁵. The plants are used to treat lots of health problems like nervous disorders (such

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as muscle spasmodic, epilepsy, headache, hysteria), also are used for anemia, skin infections, blackheads, anxiety, bronchitis, catarrh, chest congestion, asthma, blood impurities, cholera, glandular, swelling, headaches, conjunctivitis, cough, diarrhea, eye and ear infections, fever, abnormal blood pressure, pain in joints, pimples, psoriasis, respiratory disorders, scurvy, semen deficiency, sore throat, sprain, tuberculosis, for intestinal worms, lactation, hypertension and diabetes¹⁶⁻¹⁷.

Pests and diseases are recognized as a major factor responsible for the decline in crop productivity, generally this has resulted in increased use of pesticides in an effort to increase productivity. However, regular applications and indiscriminate use of these chemicals can have unintended environmental and human health consequences. Meeting the minimum requirements of health standards is generally regarded as one of the elements of sustainable agricultural development. It is necessary to conduct regular monitoring of farm produce for pesticides residues and their metabolites to ascertain if their concentrations meet prescribed limits¹⁸⁻¹⁹.

The study seeks to assess the contamination levels of pesticides residues in *Moringa oleifera* seed (cotyledon and testa) collected from a garden in Ado-Ekiti, Southwestern Nigeria so as to ascertain if the residual levels remain below prescribed limits by national and international standards for pesticides in food.

Materials and Methods

Sample collection and preparation

Samples of *Moringa oleifera* seeds were harvested in a garden in Ado-Ekiti, Nigeria in the month of June, 2019. The samples were collected and analysed so as to know the levels of pesticides accumulated by the seeds. The harvested seed samples were carefully separated into cotyledon and testa. The separated parts were grounded by agate mortar and later blended with an Excella Mixer blender. The homogenized blended samples were stored in glass bottles and kept in a refrigerator at 2.8 °C (37°F) prior to subsequent analysis.

Reagents used

The reagents used were of spectra purity. They included GC grade n-hexane and acetone, methanol, methylene chloride, acetonitrile and ethyl acetate.

Extraction and clean-up procedure of the samples for pesticides analysis

Twenty gramme of the homogenized samples were each placed in a glass container with 20 g of anhydrous Na₂SO₄ and mixed with 100 ml of a 1:1 mixture of n-hexane and acetone (v/v) and 20 ml of methanol. Solid-liquid extraction was performed on a magnetic stirrer for 2 hours at room temperature. After the extraction, the emulsion was transferred into cuvettes and put in an ultracentrifuge for 10 minutes at 3000 cycles min⁻¹, for the separation of three phases (organic, aqueous and solid). The organic extract was pipetted and water contained in it was removed by transferring it through a layer of anhydrous Na₂SO₄. The sulphur present in the sample was removed with an activated elementary powder (copper fine powder GR particle size 63 µm) and cyclohexane on a magnetic stirrer for 10 minutes. The cyclohexane extract was purified using a Florisil column.

A 30 cm glass stoppered column was filled with 6 g activated florisil (60- 100 mesh) and topped with 2 g of anhydrous sodium sulphate. The sample extract was transferred to the Florisil column which was already saturated with n-hexane. The column was eluted with 200 ml eluant (50% methylene chloride + 1.5% acetonitrile + 48.5% n-hexane) at the rate of 5 ml/min. The collected eluent was concentrated on rotary evaporator at 40°C and dissolved in 2 ml of ethyl acetate for pesticides analysis.

Gas chromatographic conditions

The gas chromatographic conditions for the pesticides were as follows: GC model: HP6890 powered with HP ChemStation Rev. A 09.01[1206]; the carrier gas flow rate was 1.0 ml/min; injector temperature: split injection: 20:1; carrier gas: hydrogen; inlet temperature: 250 °C; column type: HP 5MS ; column dimension: (10 m x 0.25 mm x 0.2 µm); oven programme: initial temperature at 110 °C for 1 minute, first ramping 10 °C/min for 14 min (250 °C); maintained for 3 min; second ramping 10 °C/min for 5 min (300 °C); maintained for 4 mins; detector: pulsed flame ionization detector (PFPD); detector temperature: 320°C; hydrogen pressure: 20 psi; nitrogen column air: 20 psi; compressed air: 35 psi. The total run time was 31 minutes.

Statistical evaluation

The data collected were subjected to statistical analyses of inferential and descriptive modes. For the descriptive modes, we carried out the following calculations: mean, standard deviation (SD) and coefficient of variation percent (CV%). For inferential statistics we calculated for the correlation coefficient (r_{xy}), variance (r_{xy}^2) and regression coefficient (R_{xy}). The r_{xy} value was subjected to critical level at $r_{xy} (r_{=0.01})$ to find out if significant differences existed between the data for the sample cotyledon and the corresponding testa²⁰. Furthermore, the r_{xy} value was converted to the value of coefficient of alienation (C_A) and index of forecasting efficiency²¹ to find out whether there would be a possible predictive relationship between the cotyledon and the testa pesticides values.

Results and Discussion

The concentrations of pesticides in the cotyledon and testa samples are depicted in Table 1. The pesticides concentration ($\mu\text{g}/\text{kg}$) in the cotyledon ranged from 0.031 (2, 4, 6-trichlorophenol) to 0.313 (oxamyl), while the testa ranged from 0.004 (pyriproxyfen) to 1.99 (cypermethrin). The most concentrated pesticide was cypermethrin with mean value of $1.08 \pm 1.29 \mu\text{g}/\text{kg}$ and coefficient of variation (CV%) of 120. Eleven (11) pesticides; phosphine, bromoethane, simazine, chlorotoluron, dichlorvos, cypermethrin, pirimiphos-methyl, pyriproxyfen, methoxychlor, aldrin and deltamethrin showed high CV% of 61.8 – 120, meaning that the pesticides reflected high spread of values of pesticides concentration between the cotyledon and the testa of *M. oleifera*. However, the parameters concentrations were close in some of the parameters as evidenced in the some low values of the CV%. Oxamyl, cyanazine, fenvalerate, chlorpyrifos, aldrin and phosphine were the highest concentrated with the concentration trend of cypermethrin > oxamyl > cyanazine > fenvalerate > phosphine > chlorpyrifos > aldrin. In real values for cotyledon, we have percentage levels of these pesticides over the total pesticide levels as follows oxamyl (7.07%), cyanazine (3.76%), cypermethrin (3.76%), fenvalerate (4.12%), phosphine (1.50%), chlorpyrifos (3.18%) and aldrin (1.64%); testa: cypermethrin (34.0%), oxamyl (2.59%), cyanazine (4.22%), fenvalerate (3.63%), phosphine (5.38%)

chlorpyrifos (3.98%) and aldrin (4.74%). Oxamyl and cypermethrin were the major constituents of the total pesticides in the samples.

The pesticides total load in the testa was higher than in the cotyledon: cotyledon ($4.34 \mu\text{g}/\text{kg}$) and testa ($5.86 \mu\text{g}/\text{kg}$); this gave a ratio of 1.00:1.35. The difference between the two total values was $1.52 \mu\text{g}/\text{kg}$ or 25.9%. This meant that when testa is removed from this sample of *M. oleifera* about 25.9% of pesticides would have been removed when the testa is removed. Such would happen in the preparation of Bean cake (akara) and boiled moist bean (moinmoin). When testa of beans are removed, the testa would be dried and fed to animals like goats etc. This would mean that such pesticides would be re-circulated if such goat is slaughtered for human consumption. Since pesticides could be consumed either through the *M. oleifera* bean seeds or through the animal consumption, it becomes imperative to always monitor the level of pesticides in the beans. All the pesticides levels in the samples were below the maximum residual level (MRL), yet there is still need for caution. Residual levels of these pesticides were below the maximum permissible limits set by the European Union (EU) Commission²².

Comparison of the cotyledon and testa samples highlighting the parameters differences with their percentages is also shown in Table 1. In the comparison, 34 pesticides were compared out of these, 19/34 (55.9%) had values in the cotyledon greater than the testa, while 15 parameters (15/34 or 44.1%) had values in testa greater than the cotyledon samples. The parameters differences (where testa > cotyledon) in the values that ranged from -0.021 (-27.3%) to -1.83 (-1121%) where 2,4-D and cypermethrin had the least and the highest value changes. The parameters differences (where cotyledon > testa) in the values that ranged from 9.57% to 96.1% where metolachlor and pyriproxyfen had the least and highest values respectively. Khan et al.²³ reported not detected for 34 pesticides in *Moringa oleifera*. *M. oleifera* can be effectively utilized as a natural biopesticide and inhibitor of several plant pathogens. It can be included in integrated pest management strategies. Moringa and its products have different uses in many agricultural systems. The use of Moringa as a crop enhancer is an eco-friendly way of improving crop yields at the lowest possible cost. One of the most important characteristics

of Moringa is that it has high biological and nutritional values and can be used as animal feed, green fertilizer, medicine, biopesticide and in seed production. Irikannu et al.²⁴ investigated the mortality and repellency effect of *Moringa oleifera* seed oil on the stored products pests under ambient temperature of 28 °C – 32°C and relative humidity of 72 – 80%. Five different concentrations (%) level of 20, 10, 5, 2.5 and 1.5 responded to 200, 100, 50, 25 and 2.5µl/ml of the Moringa seed oil per milliliter. Their study showed no significant differences in mortality and repellency effects recorded within and between the groups ($p \geq 0.05$). Their studies also showed that Moringa seed oil has poor mortality and repellency to the insects' pests as not more than 6.6% of mortality and repellency effect were recorded in any of the treatment. Leaves of *Moringa oleifera* possess fungicidal properties particularly against *Pythium* sp that causes damping off diseases of seedlings²⁵; ethanol extracts of the leaves were also found to be effective against plant nematodes *in vivo* and *in vitro*²⁶. The seeds possess antimicrobial⁽²⁷⁻²⁸⁾, anti-inflammatory, antispasmodic, diuretic and antitumor properties⁽²⁹⁻³⁰⁾.

Table 2 showed the inferential analysis of the data earlier depicted in Table 1. The following values were low: r_{xy} (0.0934), r_{xy}^2 (0.0088) and R_{xy} (0.5499); also the mean₁ (a reflection of the cotyledon) and mean₂ (a

reflection of the testa) were both low in their values. The $r_{\text{calculated}} \lll r_{\text{Table}}$ since $r_{=0.01}$ had a value of 0.449; this meant that no significant relationship existed between the pesticides in cotyledon and testa of *M. oleifera*. The CV% values were far apart between the cotyledon and testa since CV% in cotyledon (44.3%) \lll CV% in the testa (194%). Whereas the cotyledon pesticides values were much close to each other (CV%=44.3%), pesticides values in the testa were much scattered (CV% = 194%). The R_{xy} value showed that for every 1.0 µg/kg increase in the cotyledon pesticide value, the corresponding increase in the testa was 0.5499 µg/kg.

The C_A value in Table 2 was high at 0.9956 (99.6%) with a corresponding low value of IFE at 0.0044(0.44%). It should be noted that $C_A + \text{IFE} = 1.00$ or 100. Whereas C_A represents lack of relationship between two compared entities, IFE predicts the level of relationship between two compared entities. Also, while C_A is equivalent to the error of prediction, IFE gives a value for the reduction in the error of prediction. When $C_A > \text{IFE}$, prediction becomes difficult and one of the pairs would have a set of characteristics different from the other member of the pair. Hence, since $\text{IFE} \lll C_A$ in this report, C_A was much higher and therefore the cotyledon would have different biological/chemical behaviour compared to the testa and vice versa.

Table 1: Concentration (µg/kg) of pesticides in cotyledon and testa in *Moringa oleifera*

	Cotyledon	% of TP	Testa	% of TP	Mean	SD	CV%	Diff. (C-T)	%diff.
Phosphine	0.065	1.50	0.315	5.38	0.190	0.177	93.0	-0.250	-385
Bromoethane	0.203	4.68	0.060	1.02	0.132	0.101	76.6	+0.143	+70.4
2,4,6-Trichlorophenol	0.031	0.714	0.014	0.239	0.023	0.012	53.4	+0.017	+54.8
Simazine	0.109	2.51	0.042	0.717	0.076	0.047	62.3	+0.067	+61.5
Isoproturon	0.103	2.37	0.075	1.28	0.089	0.020	22.2	+0.028	+27.2
Chlorotoluron	0.191	4.40	0.045	0.768	0.118	0.103	87.5	+0.146	+76.4
Carbendazim	0.117	2.70	0.095	1.62	0.106	0.016	14.7	+0.022	+18.8
Mecoprop	0.136	3.13	0.189	3.23	0.163	0.037	23.0	-0.053	-39.0
Atrazine	0.083	1.91	0.142	2.42	0.113	0.042	36.9	-0.059	-71.1

Cont... Table 1: Concentration (µg/kg) of pesticides in cotyledon and testa in *Moringa oleifera*

2,4-D	0.077	1.77	0.098	1.67	0.088	0.015	17.0	-0.021	-27.3
Dichlorvos	0.226	5.21	0.057	0.973	0.142	0.120	84.5	+0.169	+74.8
Oxamyl	0.313	7.07	0.152	2.59	0.233	0.114	49.0	+0.161	+51.4
Carbofuran	0.131	3.02	0.055	0.939	0.093	0.054	57.8	+0.076	+58.0
Dichloroprop	0.127	2.93	0.096	1.64	0.112	0.022	19.7	+0.031	+24.4
Cyanazine	0.163	3.76	0.247	4.22	0.205	0.059	28.9	-0.084	-51.5
Pentachlorophenol	0.120	2.76	0.101	1.72	0.111	0.013	12.2	+0.019	+15.8
Fenoprop	0.133	3.06	0.189	3.23	0.161	0.040	24.6	-0.056	-42.1
Alachlor	0.110	2.53	0.148	2.53	0.129	0.027	20.8	-0.038	-34.5
Fenitrothion	0.121	2.79	0.080	1.37	0.101	0.029	28.8	+0.041	+33.9
Pendimethalin	0.108	2.49	0.216	3.69	0.162	0.076	47.1	-0.108	-100
Metolachlor	0.094	2.17	0.085	1.45	0.090	0.006	7.11	+0.009	+9.57
Cypermethrin	0.163	3.76	1.99	34.0	1.08	1.29	120	-1.83	-1121
Phosphamidon	0.137	3.16	0.095	1.62	0.116	0.036	25.6	+0.012	+30.7
Pirimiphos-methyl	0.172	3.96	0.026	0.444	0.099	0.103	104	+0.146	+84.9
Fenvalerate	0.179	4.12	0.213	3.63	0.196	0.024	12.3	-0.034	-19.0
Pyriproxyfen	0.102	2.35	0.004	0.068	0.053	0.069	131	+0.098	+96.1
Endosulfan	0.187	4.31	0.083	1.42	0.135	0.074	54.5	+0.104	+55.6
Malathion	0.088	2.03	0.155	2.65	0.120	0.050	41.2	-0.070	-82.4
Methoxychlor	0.159	3.66	0.038	0.648	0.099	0.086	86.9	+0.121	+76.1
Chlorpyrifos	0.138	3.18	0.233	3.98	0.186	0.067	36.2	-0.095	-68.8
Aldrin	0.071	1.64	0.278	4.74	0.175	0.146	83.9	-0.207	-291
Dieldrin	0.080	1.84	0.043	0.734	0.062	0.026	42.5	+0.037	+46.5
Permethrin	0.069	1.59	0.106	1.81	0.088	0.026	29.9	-0.037	-53.6
Deltamethrin	0.038	0.876	0.097	1.66	0.068	0.042	61.8	-0.059	-155
TP	4.34	100	5.86	100	5.10	1.07	21.1	-1.52	-35.0

TP= Total pesticides, C-T = cotyledon-testa

Table 2: Statistical analysis of the results from Table 1

Statistics	
r_{xy}	0.0934
r_{xy}^2	0.0088
R_{xy}	0.5499
Mean1	0.1278
SD1	0.0566
CV%1	44.3

Cont... Table 2: Statistical analysis of the results from Table 1

Mean2	0.1709
SD2	0.3311
CV%	194
CA	0.9956 = ($\times 100 = 99.6\%$)
IFE	0.0044 = ($\times 100 = 0.44\%$)

n-2= 34-2 (df)=32 Critical factor of $r_{=0.01} = 0.449$ at 30(df)

Conclusion

The study revealed the residual levels of pesticides in cotyledon and testa of *Moringa oleifera*. The cotyledon pesticides values were much close to each other (CV%=44.3%), while pesticides values in the testa were much scattered (CV% = 194%). 19 parameters or 55.9% had higher values in the cotyledon greater than the testa, while 15 parameters or 44.1% had values in testa greater than the cotyledon samples. Although residue levels of these pesticides are below the maximum permissible level, there is still need for constant regular monitoring to ensure that residual levels remain below prescribed limits by national and international standards.

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Hermeneutic Phenomenology Study: Impact of Risky Sexual Behavior on Psychological Adolescents in the Coastal Areas of Rajik Village, Bangka Belitung Islands in 2019

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Abstract

The problem of sexuality is a complicated problem for adolescents because adolescence is a period where a person is faced with various challenges and problems that have an impact on adolescent psychology. The purpose of this study was to explore the impact of risky sexual behavior on adolescents' psychological well-being in the Coastal Area of Rajik Village, Simpang Rimba District. The design of this study is qualitative with a phenomenological hermeneutic approach. The number of participants in this study was five participants consisting of three teenagers, one counseling guidance teacher, and one teenager who became pregnant before marriage. Data collection methods in this study are in-depth interviews and field notes. Data analysis uses hermeneutic approach¹. This study received two main categories, namely: (1) risky sexual behavior; (2) psychological impact. Adolescents who engage in risky sexual behavior are holding hands, ever hugging, ever kissing, ever touching sensitive body parts, and having sexual intercourse in the form of intercourse, besides the psychological effects that occur in adolescents are feeling anxious, afraid, embarrassed and guilty and sin and consider things normal and natural to do. We encourage further research to develop a reproductive health education module for adolescents.

Keywords: *risky sexual behavior, teenagers, psychological impact*

Introduction

Human resources are a critical component in achieving health development goals. High-quality human resources are needed to improve the health status of the community. Teenagers, as part of the human resource component, are precious assets for the nation in the future. Adolescence is a period when a person has not been said to be an adult but is no longer categorized as children where physical, mental, social, and economic changes occur^{2,3}. According to World Health Organization⁴ data, in 2014, it was estimated that the number of adolescent groups in the world was 1.2 billion or 18% of the world's population. Whereas in Indonesia, the number of the 10-19 age group according to the 2010 Population Census was 43.5 million or around 18% of

the population⁵. This data shows that adolescents are one of the populations who are vulnerable to risky behaviors such as sexuality issues.

The problem of sexuality is a complex problem for adolescents because adolescence is a period where a person is faced with various challenges and problems, both developmental and environmental problems. This issue is an exciting material to be discussed and discussed because it is sensitive and prone to moral, ethical, religious, and socioeconomic backgrounds. It certainly raises the concerns of various parties, both parents, teachers, educators, and other adults⁶. According to the Indonesian Ministry of Health⁵, adolescence is a period of rapid growth and development both physically, psychologically, and intellectually. The unique nature of adolescents has a great sense of curiosity, likes opportunities and challenges, and tends to be brave to risk their actions without being preceded by careful consideration. If decisions taken in the face of conflict are inappropriate, they will fall into risky behavior and may

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have to suffer short-term and long-term consequences in a variety of physical and psychosocial health problems.

According to the World Health Organization (2014), the majority of teenage births aged 15-19 years occur in developing countries with the incidence of adolescent childbirth reaching 95%. The highest prevalence is in Nigeria (79%) following Congo in second place with 74%, and in third place is Afghanistan 54%, then Bangladesh 51%. It shows the close attachment between adolescent pregnancy cases with underdevelopment and socioeconomic inadequacy⁴. In Indonesia, as reported in a Scientific Journal of Health, research conducted by the Institute for Love and Humanitarian Studies (LSCK) in Yogyakarta found that 97.5% of respondents claimed to have risked sexual relations⁷. According to Miswanto⁸, psychological consequences that occur in adolescents who engage in risky sexual behavior, one of which is to get pregnant before marriage, puts adolescent girls in a very dilemmatic position. In the view of society, adolescent girls who become pregnant before marriage are a family disgrace that violates social and religious norms. This social judgment is not infrequently pervasive and continues to be socialized in him, resulting in a situation where the teenager feels confused, anxious, embarrassed, and guilty. Also, feelings of depression, pessimism about the future, sometimes accompanied by hatred and anger both to themselves and their partners, and to the fate that makes physical, social, and mental health conditions related to the child's reproductive system, function, and reproduction process, young unfulfilled and disturbed.

According to the National Family Planning Coordinating Board², in 2012, 4 (four) provinces in Indonesia with the highest percentage of early marriage (15-19 years) were Central Kalimantan (52.1%), South Kalimantan (48.4%), Bangka Belitung (47.9%) and Central Sulawesi (46.3%). This study shows that the Bangka Belitung Province is included. Based on the interviews we conducted with the Guidance Counseling teacher at SMPN 2 Rajik Simpang Rimba Village, it was found that every year there are always students who drop out of school and get married because they are pregnant before marriage. Furthermore, we also got data from a mathematics teacher at the Simpang Rimba High School of the Bangka Belitung Islands that, in 2018, there was already one student who dropped out of school and

got married because she was pregnant. Based on the phenomena described above, researchers are interested in examining the impact of risky sexual behavior on adolescents' psychological well-being in the Coastal Area of Rajik Village, Bangka Belitung Island Province, in 2019.

Material and Methods

The design of this study is hermeneutic phenomenology with an interpretive or constructivist paradigm approach⁹. This research was conducted at SMP 2 Simpang Rimba because, in this school, there had been incidents of pregnant students before marriage making it easier for researchers to explore the psychology of adolescents who had engaged in risky sexual behavior. Participants in this study were five people consisting of four teenagers consisting of two female students and two male teenagers of premarital sexual behavior, one counseling teacher adolescent at-risk sexual behavior. Data collection through in-depth interviews and supported by field notes. Data analysis in phenomenological hermeneutic research is according to the steps of analytical, interpretive research data analysis by Diekmann, Allen, & Tanner¹.

Results

Research results obtained through in-depth interviews and supported by field notes consisting of categories and subcategories. The subcategories found will be discussed further below:

Category 1: Risky Sexual Behavior

a. Holding hands

It can be seen from the participants who said the following:

"...I have been dating since the 2nd grade of middle school, and I have traveled to the sea; we often hold hands while walking because it is normal." (P1).

Whereas the second participant said as follows:

"...Once... When I go out with my girlfriend, or when I get together with my friends who have a girlfriend, holding hands is normal....." (P2).

The third participant also said the following:

“.....We once held hands. ... Yes, that is so ... (smile and do not answer clearly)... “(P3).

Furthermore, the fourth participant stated as follows:

“...I am dating already from class 1, I once dated a senior, if dating must have held hands and loved each other ...” (P4).

While the fifth participant said as follows:

“.....students now may be because the times are getting more advanced and each of us is given freedom in accessing information so that they are also free to get along, and indeed on average have a girlfriend, although he said puppy love indeed and I see joking with each other and holding hands is ordinary things, though small things will usually become a habit and lead to more sensitive things.....” (P5).

b. Hugging or embracing

The first participant mention that:

“.....if the others also have a big hug from behind or I embrace from behind while shocking him” (P1)

The second participant also said the following:

“...others have also, called dating, hugged briefly while embracing” (P2)

Whereas the third participant said as follows:

“...If others also have, for example, we hug while laughing too....” (P3).

The fourth participant states as follows:

“.....for others (while looked down)..... yes usually hugging and embracing each other when motorized, worried about the fear of falling,....” (P4)

The fifth participant said:

“.....As I said earlier, it is true that small things sometimes lead to big ones, sometimes students never tell me as a counseling teacher about things like that, but if I look and pay attention to students who are told by friends who are dating normally playing while sometimes hugging from behind, maybe we think it is normal to joke around with each other.....” (P5)

c. Kissing

The first participant said the following:

“.....besides kissing the forehead too once, feel love and affection” (P1)

The second participant said:

“...I also kissed, and it was only once (laughing downward).....” (P2).

Whereas the third participant said as follows:

“...for others I have also kissed my lips with my girlfriend because we feel loved ... but actually feel like that ...” (P3).

The fourth participant said:

“...yes sis we must have kissed because we love and feel love,....” (P4).

d. Grope the breast

The results showed that teen participants had never touched their breasts. It can be seen from the participants who said the following:

“....especially when I have felt it (pointing and holding the chest)...”. (P3).

e. Having sex (intercourse)

These results were obtained from former students who had attended Simpang Rimba Middle School 2. It can be seen from the participants who said the following:

“...yes...feel love with our boyfriend whatever we do to keep our relationship, and what makes me drop out of school is when I was declared eight weeks pregnant because I had sex (while looking down and holding hands)....” (P4)

Whereas the fifth participant said as follows:

“.....We experienced a number of embarrassing things for our school with our students who dropped out of school due to pregnancy before marriage,.....” (P5)

Category 2: Psychological Impacts of Risk Sexual Behavior

a. Psychological

The results showed that adolescent participants who engage in sexual behavior are at risk of experiencing psychological changes such as anxiety, fear, and shame. The matter can be seen from the participants as follows:

“.....After doing that, I felt anxious and worried because I knew that this was not right, but what could we like the same, but at that time I felt guilty and scared Sis, afraid of being found out by parents and afraid of getting pregnant, I also felt guilty about God Sis, but yes when I found out I was afraid and rarely left the house, just ate in the room, I was scared, and I felt like wanting to go far, but my girlfriend said if we were pregnant, we would get married.....” (P4).

While other participants said the following:

“..... I once kissed (smiled) when he was our birthday to the beach together with grilled fish friends. ... quiet place, after doing that my heart trembles” (P2)

Furthermore, the results of other research studies indicate that adolescent participants who engage in sexual behavior are at risk of not experiencing psychological changes. The matter can be seen from the participant’s statement as follows:

“.... Just ordinary, it is dating, right? many other friends do hugs, kisses, just try it...” (P1)

The third participant also said the following:

“Hahaaa... It feels rather ordinary.... especially when I have felt it (pointing and holding the chest) ...”. (P3).

Discussion

Based on the results of the study, it found that two main categories emerged in this study. The two main categories are as follows.

1. Risky sexual behavior

According to Stuart³, adolescence is a period of age transition where there are changes in social, emotional, and physical aspects that can cause stress conditions and trigger risk behaviors in adolescents. One of the risk behaviors is risky sexual behavior. From the results of the study, it was found that all participants have engaged

in risky sexual behavior from holding hands, hugging, kissing, and intercourse or intercourse. It shows and is in line with the results of Stuart’s study, where adolescence can cause stress conditions and trigger risky sexual behavior. Furthermore, according to Chan et al.¹⁰ in Malaysia, there was an increase in teenagers who became pregnant out of wedlock due to shifts and ignorance of religious values. In this condition, adolescents become high-risk populations, and consequently, adolescents experience severe depression. The findings of this study indicate that risky sexual behavior occurs due to the unpreparedness of adolescents undergoing the process of growth and development changes into adulthood. Also, rapid development that is not matched by careful planning makes teenagers have free sex.

“... Yes, we are not really active in religious activities because we believe our students are good at reciting the Koran and praying ...” (P5).

Furthermore, according to Chan et al.¹⁰ also said that pregnancy before marriage is due to shifts and ignorance of religious values. It can be seen from the research results obtained as follows:

“..... I also feel guilty about God, but yes when I know that I am pregnant, I feel scared and rarely go out of the house, just eat in the room, how do I feel so scared, and it feels like to go far away, but my boyfriend said if we get pregnant, we will get married.....” (P4).

The results of the study also found that one of the teens doing risky sexual behavior is due to the curiosity of adolescents trying new things as done by adults. It is in line with the results of research conducted by Sumiatin et al.¹¹, which states that adolescents have a high sense of curiosity, one of which is the desire to be like an adult. It causes teens to want to try to do what is often done by adults, including those related to sexuality issues. Furthermore, Loew¹² states that adolescents tend to experiment with risky behaviors because they want to know how or what they feel and or what will happen. Just like babies are curious when they are in a new environment, teenagers are curious when they enter the stage of development towards maturity. Incorrect understanding of sexuality in adolescents makes them try to experiment about sex problems without realizing the dangers arising from their actions, and when problems arising from sexual behavior begin to emerge,

adolescents are afraid to express these problems to parents¹³.

2. Psychological Impacts of Adolescents at Risk Sexual Behavior

It is interesting to study the current condition of adolescents. Adolescent sexual risk behaviors nowadays tend to be worrying. The results of the study found that all participants had sexual intercourse with sexual behavior ranging from holding hands to engaging in intercourse. This fact is then increasingly interesting, namely the psychological changes that occur and the absence of changes that occur in adolescents who engage in risky sexual behavior. As for adolescents who experience psychological changes, we can see from the results of the study, namely:

“.....After doing that, I felt anxious and worried because I knew that this was not right, but it was okay for us to like it, but at that time I felt guilty and scared, afraid of being found out by parents and afraid of getting pregnant, I also felt guilty about God, but yes when I found out that I am pregnant, I was scared and rarely left the house, just ate in the room, I felt scared, and it felt like to go far away, but my girlfriend said if we were pregnant, we would get married.....” (P4).

It is in line with the results of research conducted by Wulandari & Tamsil Muis¹⁴, states that some of the psychological effects of sexual behavior are feeling anxious and afraid after having sexual behavior, overshadowed by feelings of sin when engaging in sexual behavior, but feel alienated. Furthermore, research conducted by Istiqomah & Notobroto¹⁵, states that premarital sexual behavior in adolescents can lead to guilt, fear, anxiety, if pregnancy can be ostracized in the community, feelings of embarrassment and subsequent depression will cause suicide. Besides the results of research from Kasim¹⁶, states that the psychological consequences experienced by adolescents who engage in risky sexual behavior are feelings of confusion, anxiety, shame, and guilt experienced by students after learning about their pregnancy mixed with feelings of depression, pessimism about the future sometimes accompanied by hatred and anger both to yourself and to your partner, and to the fate that makes physical, social, and mental health.

While adolescents who have not experienced psychological changes can be seen from the results of the recognition of P1 and P3, this is in line with the results of Tang et al.¹⁷, which states that adolescents consider it normal to have sexual behavior because they want to try, have fun and curiosity and are always done by the adults around them.

Conclusion

The results showed that the activities carried out by adolescents who engage in risky sexual behavior were once holding hands, ever hugging, ever kissing, ever touching sensitive body parts, and having sexual intercourse in the form of intercourse. Furthermore, the impact that can be caused by risky sexual behavior can be in the form of psychological effects, including feeling anxious and afraid after having sexual behavior and being overshadowed by feelings of sin when engaging in sexual behavior. Then the teenager also thinks it is a natural and healthy thing for those who are dating. The researcher recommends further research to develop reproductive health education modules for men and women and also to develop the Mental School Health Unit (UKSJ) in each school.

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Temporal Comparison of Antibiotics Administration for Caesarean Section: A Prospective Randomized Study in Baghdad

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Abstract

Objectives: To compare the efficacy of antibiotic administration prior to skin incision and after clamping of umbilical cord as attempt for preventing the rates of maternal post-caesarean infectious morbidities and adverse neonatal outcomes.

Methods: In this prospective randomized study design, 100 pregnant women prepared to undergo CS were randomized evenly into two groups based on time they received prophylactic antibiotics either half to one hour prior to skin incision (group-1) or immediately after cord clamping (group-2). The post-caesarean maternal infectious morbidities are the primary outcomes, whereas neonatal infectious morbidities are secondary outcomes.

Results: Postpartum maternal infectious outcomes (fever, SSI, wound dehiscence, endometritis, UTI) were significantly lower in pre-incision group as compared to post-cord clamping group as well as the mean of maternal hospital stay respectively ($P < 0.05$). In spite the secondary neonatal outcomes found to be comparable among study's groups, but such differences did not reach the statistical significant.

Conclusion: Apart from neonatal outcomes, preoperative administrations of antibiotic significantly reduce the maternal post-caesarean infectious morbidities in comparison to its intraoperative administration.

Keyword: Caesarean section, prospective, prophylactic antibiotic, endometritis, surgical site infection, neonatal sepsis.

Introduction

Recently, a remarkable upsurge in the rate of caesarean-section has been reported worldwide. In Iraq, the overall caesarean-section rate reached 24.4% in 2012^[1] which much higher than that of 5-15% recommended by World Health Organization (WHO)^[2].

The increased risk of postoperative infections after caesarean-section delivery has been well identified, causing 5 to 20 folds increase in infection rates in comparison with normal vaginal delivery^[3, 4].

Post-caesarean infection may increase maternal mortality and morbidity, but fortunately it has been declined in last decades due to improvements in hygienic conditions, using prophylactic antibiotic and other antisepsis measures^[5].

Prophylactic antibiotics are constantly associated with caesarean delivery and often used universally. The beneficial effect of antibiotics usage in reducing the post-caesarean infectious morbidity and mortality either planned or emergent is well established^[6] covering 75% of post-caesarean infectious morbidity reduction incidence^[7].

Among the most common infectious complications associated with caesarean delivery are; surgical site

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infection (SSI), endometritis, fever, and urinary tract infections. SSI and endometritis are hitherto the most significant causes of post-caesarean infectious morbidity with the incidence of endometritis range between 20%-85% and 25% for wound infection particularly without antibiotic prophylaxis^[8]. According to WHO, prophylactic antibiotics found to make a substantial reduction in the incidence of post-caesarean endometritis by two thirds to three-quarters of cases and up to three quarters for the incidence of wound infections, similarly, postpartum febrile morbidity and UTIs incidences are decreased^[9].

The most common prophylactic antibiotics used is ceftriaxone which is third-generation cephalosporin ^[4]. As broad-spectrum antibiotics, its usage was associated with statistically significant reduction in infection rates of both endometritis and SSI as compared to narrow-range antibiotic prophylaxis. Furthermore, the length of hospital stay was also significantly shorter by using broad-spectrum antibiotics^[5].

The current point of debate among literature is the timing of prophylactic antibiotics administration, taken in consideration that single-dose prophylaxis has been accepted, which may be administered 30-60 minutes prior skin incision owing to get optimal concentration at the surgical site thus reducing SSI, or administrated intra-operatively after clamping of umbilical cord for apprehension of fetal exposure to antibiotic through placenta that could potentially mask neonatal infection and their blood culture findings and thereby interferes with proper treatment in addition to emergence of resistant strains^[3, 6, 10].

Therefore, the aim of this study is to compare the efficacy of ceftriaxone administration prior to skin incision and after clamping of cord as attempt for preventing the rate of maternal post-caesarean section infectious morbidities and adverse neonatal outcomes.

Methods

The current prospective randomized study was conducted in the Gynecology and Obstetrics Department of Al-Hayat private hospital for Dominican-Sisters of Saint Catherine in Baghdad city, Iraq over a two months period from March through May 2019. All pregnant women ≥ 37 weeks of gestational age who admitted for

labour and fulfilled eligibility criteria added to giving written consent and had a decision for caesarean delivery (planned or emergent) were included in the study, the 37 weeks of gestation was chosen in order to avoid bias that pre-maturity is potential risk for adverse perinatal outcomes.

Pregnant women who were allergic Cephalosporin, those who had ruptured membranes >12 hours either with or without antibiotic-prophylaxis, those who received antibiotics within a week prior to caesarean delivery for any reasons, those pregnant with chronic diseases such as heart disease, renal disease or diabetes-mellitus, and those who were febrile from unknown origin were excluded from the study.

Incisively 120 pregnant women were enrolled in the study who were 37 gestational weeks admitted to hospital and provided written consents for participation. Afterward, detailed history regarding socio-demographic characteristic including age and parity, detailed current and past obstetrical, medical, surgical and menstrual histories were taken followed by rigorous general and obstetric examinations were done. Then 11 pregnant women were excluded who not-fulfilled inclusion criteria and 9 women were refused to participate.

Ultimately, a total 100 pregnant women who constitute the study's sample size were allocated randomly into two groups: Group-1 consist of 50 women who received 1-gram of ceftriaxone injection intravenously 30-60 minutes prior to skin incision after made a test of 100mg of intradermal ceftriaxone injection given slowly over 10 minutes. Group-2 consist of another 50 pregnant women who received the same dosage of antibiotic immediately after umbilical cord clamping. Those later groups' women were given test-dose 45 minutes before skin incision.

Post-operative follow-up was done looking for primary outcomes of febrile morbidity that diagnosed when temperature was $> 38^{\circ}\text{C}$ (100.4°F) on two-occasions 6 hours apart, excluding first 24 hours of delivery. This fever could be due to post-caesarean infection including; SSI that diagnosed with presence of purulent discharge, erythema and induration at incision site; endometritis that elicited if there is lower abdominal and/or uterine tenderness with tachycardia, leukocytosis, uterine subinvolution, and foul-smelling lochia; UTIs

presented with positive urine culture (bacteriuria) with burning micturition and increased frequency of micturition.

When women's febrile morbidity was recognized, they underwent a thorough examination in order to identify the source of infection. The complete blood count and urine analysis were done. Women diagnosed with superficial-SSI were managed with only dressing, whereas those with deep-SSI were managed with re-suturing after dressing. Therapeutic-antibiotics were added with respect to culture sensitivity. All women were followed-up and discharged thereafter if no other complications occur. None of the women were lost to follow-up and all 100 mothers were analyzed in the study's groups.

Regarding secondary outcomes, neonatal sepsis was diagnosed clinically and para-clinically including clinical examination, blood picture, and positive blood-culture and C-reactive protein determined by neonatologist.

Concerning Ethical consideration, such study was approved by the Ethical Committee of Family and Community Medicine Department at Al-Iraqia Medical College. Official permissions were obtained from hospitals' administration and staff. Written informed

consent were obtained from each woman and her in-charge relatives accompany with detailed explanation of study's purpose and importance and absolute confidentiality was reassured.

All recorded-data were entered and analyzed using SPSS version 25. Qualitative data were compared by Chi-square test. Quantitative data were compared using independent t-test. A $P < 0.5$ was set significant for all tests.

Results

Out of 120 pregnant women enrolled, 100 were eligible after inclusion and exclusion criteria and randomized into two groups based on time they received single-dose ceftriaxone (50 women received 1-gram half to one hour prior to skin incision and another 50 immediately after cord clamping).

Regarding the demographic characteristics, both groups illustrated to have a non-comparable characteristics including; the age (27.84 ± 0.370 vs. 27.70 ± 0.463), gestational age (37.86 ± 0.351 vs. 37.72 ± 0.454), and BMI (24.90 ± 0.303 vs. 24.76 ± 0.431) for group-1 and group-2 respectively (each $P > 0.05$) (Table 1).

Table 1 Demographic characteristic of study's groups

Characteristic (mean± SD)	Group-1 (n=50)	Group-2 (n=50)	P-value	95% CI
Age	27.84± 0.370	27.70± 0.463	1.670* 0.098	-0.026–0.306
Gestational-age (Weeks)	37.86± 0.351	37.72± 0.454	1.727* 0.088	-0.021–0.301
BMI	24.90± 0.303	24.76± 0.431	1.878* 0.064	-0.008–0.288

* Values of independent t-test.

Similarly, those other characteristics related to women's parity and indications for caesarean-section were not statistically significant (each $P > 0.05$) (Figure 1-3).

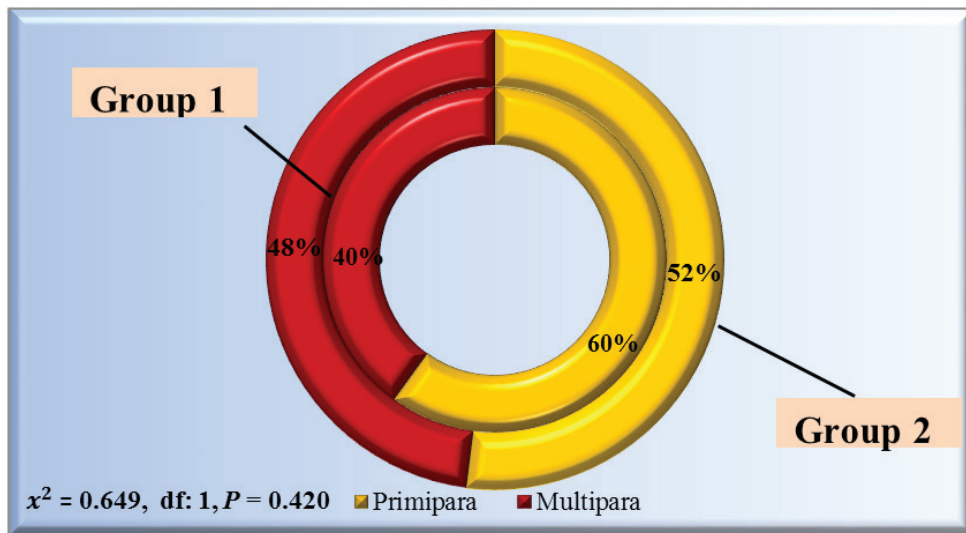


Figure 1 Distribution of maternal parity among study's groups

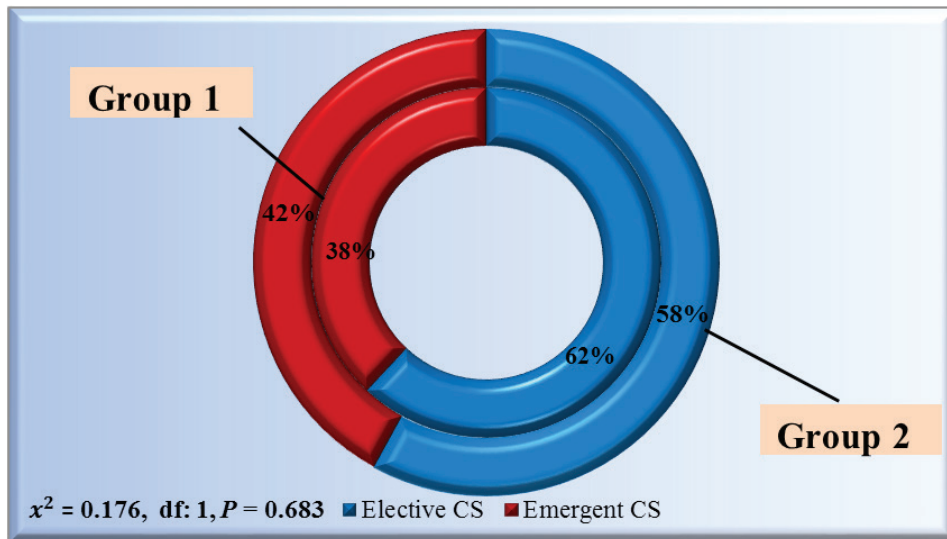


Figure 2 Distribution of caesarean-section among study's group

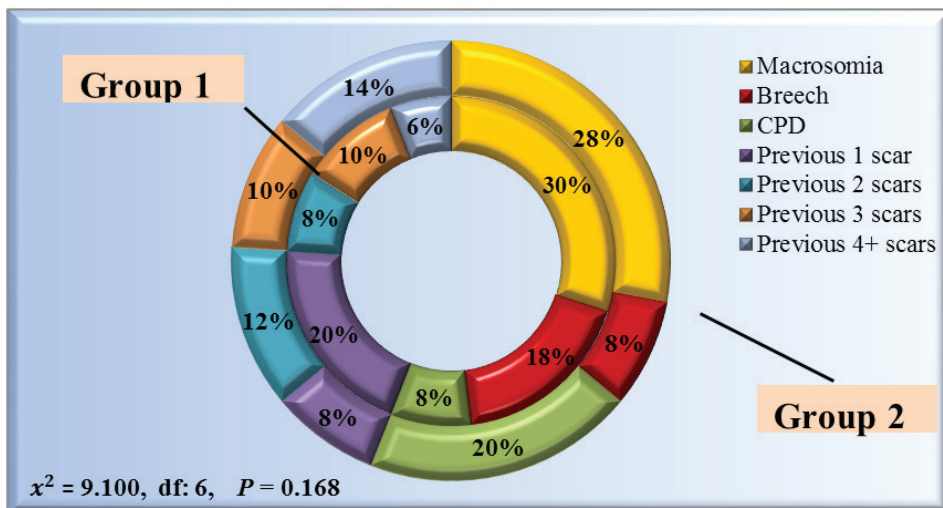


Figure 3 Indications for caesarean-section among study's groups

In respect to post-caesarean maternal outcomes, statistically significant differences were found among study's groups, where incidences of maternal febrile morbidity (fever from 2nd post-operative day) was higher among women in group-2 as compared to those whose in group-1 (20% vs. 6%) respectively ($\chi^2 \chi^2$:4.332, df:1, $P=0.037$). Likewise, the incidences of SSI (22% vs. 6%) ($\chi^2 \chi^2$:5.316, df:1, $P=0.021$), wound

dehiscence (18% vs. 2%) ($\chi^2 \chi^2$:7.111, df:1, $P=0.008$), endometritis (16% vs. 4%) ($\chi^2 \chi^2$:4.000, df:1, $P=0.04$), urinary tract infection (18% vs. 4%) ($\chi^2 \chi^2$:5.005, df:1, $P=0.025$), and maternal hospital stay in-days (4.24± 0.431 vs. 3.14± 0.351) (t: 13.993, 95% CI:-1.256- 0.944, $P=0.000$) were significantly higher among group-2 women than those in group-1 respectively (Table 2).

Table 2 Post-caesarean infectious maternal outcomes among study's groups

Maternal Outcomes	Group-1 (n=50)		Group-2 (n=50)		Total (n=100)		P-value
	n	%	n	%	n	%	
Fever	3	6.0	10	20.0	13	13.0	4.332* 0.037
Surgical site infection	3	6.0	11	22.0	14	14.0	5.316* 0.021
Wound dehiscence	1	2.0	9	18.0	10	10.0	7.111* 0.008
Endometritis	2	4.0	8	16.0	10	10.0	4.000* 0.046
Urinary tract infection	2	4.0	9	18.0	11	11.0	5.005* 0.025
Hospital stay (mean ± SD)	3.14± 0.351		4.24± 0.431		13.993** (-1.256- -0.944)***		

* Values of Pearson Chi-square test.

** Value of independent t-test.

*** P value < 0.001

Concerning neonatal outcomes, there are no statistically significant differences among study's groups in relation to neonatal morbidities of neonatal fever, sepsis, poor-feeding, birth asphyxia and admission into neonatal intensive-care unit (each $P>0.05$) (Table 3).

Table 3 Post-caesarean neonatal outcomes among study's groups

Neonatal Outcomes	Group-1 (n=50)		Group-2 (n=50)		Total (n=100)		P-value
	n	%	n	%	n	%	
Neonatal fever	3	6.0	7	14.0	10	10.0	1.778* 0.182
Sepsis	3	6.0	8	16.0	11	11.0	2.554* 0.110
Poor feeding	4	8.0	6	12.0	10	10.0	0.444* 0.505
Birth asphyxia	4	8.0	8	16.0	12	12.0	1.515* 0.218
Neonatal intensive-care admission	6	12.0	13	26.0	19	19.0	3.184* 0.074

* Values of Pearson Chi-square test.

Discussion

This study identified a significant benefit of antibiotic administration in decreasing the incidences of maternal post-operative infectious morbidities in pre-incision group as compared to post-cord clamping group, where incidence rate of fever from second-day postoperatively was significantly lower in group-1 in comparison to group-2 and such finding is consistent with what was reported by Mandal *et al.*^[4] showed that 5.4% vs. 21.5% of women who received antibiotic prior to incision and after cord clamping respectively developed fever two days postoperatively. Bhattacharjee *et al.*^[11] revealed that 33% of the women of post-cord clamping developed post-operative fever as compared to 26% of those with fever in pre-incision group. Jyothirmayi *et al.*^[12] reported that women of pre-incision group had significantly less febrile illness as compared with those who in the post-incision group. In contrast, Baaqaeel *et al.*^[6], and Kalaranjini *et al.*^[13] found that there were no significant differences regarding maternal febrile morbidity among

women who received antibiotic either pre-incision or after cord-clamping.

Diagnosed surgical site infections were identified in 6% of women of pre-incision group as compared to 22% of those who in cord clamping group which are supported to what was reported by Mandal *et al.*^[4] as 3.26% vs. 8.60% of women in comparable groups developed such complications respectively. Furthermore, the findings of Rai *et al.*^[3], Bhattacharjee *et al.*^[11], Jyothirmayi *et al.*^[12] Kalaranjini *et al.*^[13], and Brown *et al.*^[14] were also supported. However, non-significant differences were reported by Baaqaeel *et al.*^[6], and Witt *et al.*^[10], that could be attributed to differences in applied research methods and designs.

Likewise, wound dehiscence found to be significantly comparable among our study's groups with higher incidence reported among post-clamping group, and such result is similar to what was reported by Rai *et al.*^[3]. In contrast, Mandal *et al.*^[4], Witt *et al.*^[10] and

Bhattacharjee *et al.*^[11] reported that wound dehiscence had insignificant difference among groups.

Endometritis incidences were significantly comparable among study's groups with lower rates observed in pre-incision group which is in line of other studies; Rai *et al.*^[3], Mandal *et al.*^[4], Baaqaeel *et al.*^[6], Bhattacharjee *et al.*^[11], and Jyothirmayi *et al.*^[12]. However, contrary findings were reported by Austrian and Chinese studies of Witt *et al.*^[10] respectively revealed no significant differences were found regarding postpartum Endometritis among study's groups.

Post-caesarean UTI found to have significant differences between study's groups as it was higher in post-cord clamping group than that in pre-incision and such findings are in concordance of what were reported by Rai *et al.*^[3], and Jyothirmayi *et al.*^[12]. Nevertheless, these findings are contrary to other studies; Mandal *et al.*^[4], Witt *et al.*^[10] and Kalaranjini *et al.*^[13].

The mean hospital stay of mothers in present study was significantly higher in post-cord clamping group in comparison with pre-incision group which is consistently in the line of other studies; Mandal *et al.*^[4], Bhattacharjee *et al.*^[11], and Jyothirmayi *et al.*^[12]. Contrariwise, non-significant results were found in study conducted by Witt *et al.*^[10] in Austria.

In respect to neonatal outcomes, our study found that the neonatal fever, sepsis, poor-feeding, birth asphyxia and admission into intensive-care units had no significant differences between study's groups and these findings are supported by other studies; Rai *et al.*^[3], Mandal *et al.*^[4], Baaqaeel *et al.*^[6], Bhattacharya *et al.*^[11], Jyothirmayi *et al.*^[12], Kalaranjini *et al.*^[13].

Furthermore, the present study shows no significant difference among study's groups regarding demographic characteristics in relation to mean of women's age, gestational-age or their BMI as well as to the indications for caesarean-section whether in form of type or underlying causes that was also supported by other studies; Rai *et al.*^[3], Mandal *et al.*^[4], Bhattacharya *et al.*^[11], Jyothirmayi *et al.*^[12], and Brown *et al.*^[14].

Conclusion

The administration of prophylactic antibiotic preoperatively significantly reduced the incidences

of infectious maternal morbidities as compared with intraoperative administration as well as it lowers the incidences of adverse neonatal outcomes despite such differences did not attained statistical significance owing to constraints of small sample size in short span of study's conducted time. Thus the study emphasizes the need for further researches with a larger sample over long-duration to overcome the cautious interpretations resulted from power limitation of current study and achieves significant results.

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Evaluation of Plasma Protein Alpha 2 and Beta in the Patients of Hepatitis B and C Virus by Radial Immunodiffusion Technique (RID)

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Abstract

Proteins usually found in all body fluids, the proteins it is only of the blood plasma that are examined utmost frequently for diagnostic purposes. Over 100 proteins individual have a physiological mission in the plasma, plasma protein Mostly synthesize by liver, usually exclusion of protein hormones and immunoglobulins. In this study include the twenty four patients suffering from infection hepatitis C virus and twenty four patients suffering from infection hepatitis B virus. The estimation of plasma proteins alpha 2 kind are ceruloplasmin and haptoglobin and beta type is transferrin concentration by used radial immunodiffusion technique (RID). The transferrin and haptoglobin are affected, the transferrin is decline below the normal value while the haptoglobin contain the normal value. The twenty patients from each of the HCV and HBV transferrin concentration were (105 - 109) mg/dl, while ceruloplasmin (17.4 - 49.4) mg/dl and haptoglobin (71.2 - 100) mg/dl. The concentration of the last two were the normal value haptoglobin and ceruloplasmin levels that as measured in this study, Thus, it could possibly be assumed that the level of ceruloplasmin was not affected to an extent that is clinically significant.

Consequently, it is justifiable to conclude that reporting blood levels of ceruloplasmin is not of clinical value to HBV and HCV patients. Furthermore, this study showed the transferrin and haptoglobin level were the marker (out of the three) that were affected in patients with HBV and HCV when its level was compared with levels in healthy individuals, it was significant and the transferrin P (0.001), haptoglobin P (0.003). The reduction in transferrin level and increase in haptoglobin found by this study may be well linked with increased serum iron levels reported in HBV and HCV patients and the level of the fibrosis liver.

Keyword: Ceruloplasmin, Radial immunodiffusion, Haptoglobin, Proteins

Introduction

Hepatitis B is an infectious disease case through the hepatitis B virus (HBV), an covered virus have a partially double stranded, circular DNA genome, and classify within the family hepadnavirus, which affects the liver⁽¹⁾. It can cause together chronic and acute infection. Exact people have no symptoms by method

of the primary infection. Some improve a quick onset of sickness with yellowish skin, tiredness, vomiting abdominal pain and dark urine⁽²⁾. The severe pathological consequences of persistent HBV infections involve the expansion of chronic hepatic failure, cirrhosis, and hepatocellular carcinoma (HCC)⁽¹⁾.

Hepatitis C: It is an infectious illness caused through the hepatitis C virus (HCV), very small, positive sense RNA virus, single stranded, enveloped,⁽³⁾. It is a member of the Hepacivirus genus in the family Flaviviridae Chronic (HCV), Improvements in Treatment,⁽⁴⁾. that

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primarily affects the liver. Through the firstly impurity people often need mild or no symptoms. Occasionally a fever, yellow tinged skin occurs, abdominal pain, and dark urine. It could similarly be feast from an infected mother to her baby throughout birth. It is not feast by superficial contact. Diagnosis is through blood testing to look for as well anti-bodies to the virus or it's RNA. Testing is suggested in all people who are at risk. They no vaccine against hepatitis C⁽⁵⁾.

Ceruloplasmin: a ferry-oxidase enzyme that in humans is encoded through the CP gene⁽⁶⁾. It is the chief copper-carrying protein in the blood, and in adding plays a part in iron metabolism. Ceruloplasmin is an enzyme synthesized in the liver having six atoms of copper in its structure⁽⁷⁾. Ceruloplasmin transfers further than 95% percentage total of the copper in healthy human plasma⁽⁸⁾. Ceruloplasmin exhibitions a copper-reliant oxidase activity, which is related with promising oxidation of (ferrous iron) Fe^{2+} in to (ferric iron) Fe^{3+} , therefore helping in its carrying in the plasma in association with transferrin, which can transport iron that only the ferric state⁽⁹⁾.

Haptoglobin: the haptoglobin in clinical settings confirms is used to screen for and monitor intravascular hemolytic anemia, this causes a decline in haptoglobin levels. Hemoglobin free has released into circulation and hence haptoglobin will bind the hemoglobin. in reverse, in extravascular hemolysis the reticuloendothelial method, expressly hemoglobin is comparatively not released into circulation and splenic monocytes, inversely, causing haptoglobin levels to be decreased to extra hemolysis can release some hemoglobin therefore haptoglobin is not .adding, the haptoglobin gene is expressed in murine and human adipose tissue⁽¹⁰⁾. Mutations in this gene or its regulatory territory cause a hypohaptoglobinemia or haptoglobinemia. This gene has also linked to diabetic nephropathy⁽¹¹⁾. Transferrin an iron - binding blood plasma glycoproteins that take control the level of free iron in biological fluids⁽¹²⁾. Human transferrin is encoded through the gene TF⁽¹³⁾. Transmitting glycoproteins bind iron tightly, but then reversible. Though iron bound to Transmitting is fewer than (4 mg) 0.1% of over-all body iron. In humans, transferrin involves of a polypeptide chain having 679 two carbohydrate chains, amino acids. Protein the composed of beta sheets and alpha helices that form two domains⁽¹⁴⁾. Because the iron overload

protein and diseases malnutrition can happen decreased plasma transferrin increasing plasma transferrin level is often realized in patients suffering from iron deficiency anemia, throughout pregnancy. known atransferrinemia, a by means of the results from a rare genetic disorder absence of transferrin , an best characterized as a result of hemosiderosis and anemia in the liver and heart that leads to heart failure and many other complications. When the receptor is using to attract anti-bodies . Furthermost recently, transferrin and its receptor have shown to diminish tumor cells⁽¹⁵⁾.

Radial immunodiffusion: Is an immunodiffusion method used in immunology to limited, the concentration or quantity of an antigen in a model,. Anti-body is incorporated into a medium such an agar gel. The antigen is then put in a well that is punched out of the medium while the medium is on a microscope slide or in an open vessel, such as a Petri dish. The slide or vessel is then wrapped or locked, to prevent vaporization. The antigen is quantitated by means of measuring the diameter of the precipitin circle and contrast, it with the diameters of precipitin circles created by known quantities or the antigen of concentrations. Antigen-antibody complexes are little, and soluble when in antigen overflow. For most antigens, the square and area of the diameter of the circle at the circle's end- point are inversely proportional to the concentration of anti-body and nonstop proportional to the quantity of antigen. Radial immunodiffusion is use expansively for the quantitative evaluation of antigens. The antigen anti-body precipitation is made extra critical through the incorporation of antiserum in the agarose. Antigen (Ag) is then allowed to diffuse from wells cut in the gel in which the antiserum is uniformly distributed. Initially, as the antigen diffuses out of the well, its concentration is rather high and soluble antigen anti-body adducts are formed. However, as Ag diffuses within from the well, the Ag - Ab complex replies with large amount of anti-body resulting in a lattice that precipitates to form a precipitin ring.

Material and method:

1.1. EASY RID KIT

It is plates with twelve wells for quantitative limitation in radial immunodiffusion of human plasma proteins in plasma and serum. EASY RID made by Liofilchem S.r.l.

1.2. Configuration:-

Table (1): EASY RID Configuration

Product	Code	Plasma protein	Gel Colour	Test
h-Transferrina	93006	Transferrin	Green	12
h-Ceruloplasmina	93016	Ceruloplasmin	Red	12
h-Aptoglobina	93018	Haptoglobin	Green	12

1.3. Composition:

EASY RID contains, in a layer of agarose gel the monospecific antiserum to human plasma protein, produced by immunizing rabbits or goats.

1.4. Preparation of Samples:

That agreement the type of plasma protein you are look for, use a sample diluted in PBS or in isotonic salty solution, or sample undiluted. in this types of parameters we were used undiluted sample. it was stored correctly at 2-8 °C, Turbid sample was clarified by centrifugation prior to the assay.

1.5. Experimental design:

Sample was used serum samples, it was collected from marjan hospital in Al- halli privacy. Samples were diagnosed by hepatitis C and B virus with healthy individual as control, this was divided to three groups

First group: (12) samples from healthy individual as a control

Second group: (24) samples from patients suffering from HBV already diagnosis

Third group: (24) samples from patients suffering from HBC already diagnosis

1.6. Test Procedure:

1- EASY RID was removed from the covering, it was opened the plate and left to stand for nearly five min at room temperature so that any condensed water in the wells can evaporate.

2- The wells were filled with 5µL of undiluted patient's serum as indicated.

3- The plate was closed with the lid, after the samples had diffused into the gel and left to stand, it was incubated into the envelope, at room temperature for 48 hr.

4- The zone was measured by scale.

Results

Ceruloplasmin levels were within normal level range in all subjects of the study. However, in contrast to ceruloplasmin results, there were fluctuations in the blood level of ceruloplasmin in all patient groups (control, HBC and HCV). In HCV patient group, the fluctuation in the ceruloplasmin blood level is sharper than in the other two groups (control and HBV) with peak level of 50 mg/dl and trough level of around 17.2 mg/dl patient group. Although, all blood level measurements in the three different groups were in the normal level range.

The measurement of transferrin blood levels which were below the normal level range. 50% of transferring measurements in HBV patient group and 67% of the measurements in HCV patient group were lower than the normal level range. In the control group, all readings of transferrin were in the normal level range. Ten out of 24 values were around the lower end of the normal level range (about 200 mg/dl).

Table (2): Compare results of ceruloplasmin blood level in control, HBV and HCV patients groups

The groups		Mean ± SD U/1	SE	95% Confidence Interval		P-value
				Lower	Upper	
The group	Control	24.875± 1.08	1.8652	20.770	28.980	0.105*
	HBV	21.958± 1.06	1.6014	18.646	25.271	0.217*
	HCV	20.550± 0.92	1.4015	17.422	23.678	0.513*

Otherwise the reported levels of transferrin in the control patient group were approximately in the middle of the normal level range (about 300 mg/dl). Transferrin measurements in HBV patients group can be divided into two halves; one half of the values in the lower half of the normal level range (200-300 mg/dl) and the other half of transferrin values were below the normal level range (approximately 100mg/dl). The most characteristic feature of the results in this study was regarding the blood level of transferrin in HCV patients groups. In this patient group, a notable decline in the transferrin blood level that was below the normal range can be clearly observed (67% of readings were in a reported range of 100-160mg/dl). This variation in transferrin level is most likely of clinical significance to report in HCV patient due to its impact on the iron status of the patient.

The reported results of haptoglobin were generally within the normal level range in all subjects of this study. In control patients' group, haptoglobin results were approximately free of significant fluctuations (values were generally around 70 mg/dl). In HBV patients' group, the measured haptoglobin had approximately ups' and downs' level within the range of 70-230 mg/dl. HCV patient group reported relatively wider level measure, however all readings of haptoglobin were in the normal level range but its clinical significant compare with healthy individual control the P (0.007).

Table (3): Compare results of transferrin blood level in control, HBV and HCV patients groups

The groups		Mean ± SD U/1	SE	95% Confidence Interval		P-value
				Lower	Upper	
The group	Control	259.667± 1.5	1.8652	238.689	280.644	0.01*
	HBV	186.000± 1.04	1.6014	150.006	221.994	0.001*
	HCV	157.000± 1.92	1.4015	133.921	180.079	0.00*

Table (4): Compare results of haptoglobin blood level in control, HBV and HCV patients groups

The groups		Mean \pm SD U/I	SE	95% Confidence		P-value
				Interval		
				Lower	Upper	
The group	Control	71.11 \pm 1.08	0.230	70.609	71.62	0.000*
	HBV	85.60 \pm 1.06	3.002	79.83	91.82	0.000*
	HCV	137.37 \pm 0.92	11.370	133.84	160.88	0.000*

1.7. List of Abbreviations:

HBV = Hepatitis B Virus, HCV = Hepatitis C Virus, CP = Ceruloplasmin, HP = Haptoglobin, TF = Transferrin, RID = Radial Immunodiffusion, Hb = Hemoglobin and HCC = Hepatocellular Carcinoma

Discussion

Proteins are present in all body fluids, but it is the proteins of the blood plasma that are examined most frequently for diagnostic purposes. Over 100 individual proteins have a physiological function in the plasma, most plasma protein synthesized by liver, exception of immunoglobulins and protein hormones. The damage of liver by hepatitis B and C virus is affected on the plasma protein synthesis, in this study the beta type is more affected than alpha 2 type. We are choose the parameters transferrin, haptoglobin and ceruloplasmin evaluate by radial immunodiffusion technique (RID) and invasive method to diagnosis the liver damage. This study included twenty four patients suffering from infection hepatitis B virus and twenty four patients suffering from infection hepatitis C virus. The transferrin and haptoglobin are affected, the transferrin is decline below the normal value while the haptoglobin includes the normal value. The twenty four patients from each of the HCV and HBV transferrin concentration were (105 - 109) mg/dl, while ceruloplasmin (17.4 - 49.4) mg/dl and haptoglobin (71.2 - 100) mg/dl.

The concentration of the last two were the normal value haptoglobin and ceruloplasmin levels that as measured in this study, Thus, it could possibly be assumed that the level of ceruloplasmin was not affected to an extent that is clinically significant. Consequently,

it is justifiable to conclude that reporting blood levels of ceruloplasmin is not of clinical value to HBV and HCV patients. Furthermore, this study showed the transferrin and haptoglobin level were the marker (out of the three) that were affected in patients with HBV and HCV when its level was compared with levels in healthy individuals, it was significant and the transferrin P(0.001) , haptoglobin P(0.003).The reduction in transferrin level and increase in haptoglobin found by this study may be well linked with increased serum iron levels reported in HBV and HCV patients and the level of the liver fibrosis and cirrhosis. The HBV is more effected in this parameters may be will linked with types of fibrosis stages.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

Conflict of Interest: Non

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Health Behavior of Children with Autism in Indonesia

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Abstract

Background: The number of children with autism in Indonesia is believed to keep increasing, but the studies on children with autism are limited. This study aimed to assess the health behavior covering knowledge, attitude, and practice among children with autism.

Subjects and Method: The participants were Year 4 to Year 8 students of a special school for children with autism in Yogyakarta, Indonesia. The health behavior of children with autism was assessed using a questionnaire. In-depth interviews with teachers and parents were conducted to complement the data collected from the children with autism.

Results: Thirteen children participated in this study. They were ten boys and three girls aged between 11-17 years. Data showed that some children did not have proper knowledge, but they had the right attitude and behavior related to healthy lifestyle. The questionnaire showed sleep problem was commonly found in the children. Interviews with three teachers and two parents revealed the importance of continual training children with autism from young age to develop good health behavior.

Conclusion: Children with autism can have good health attitude and practice, despite their limited knowledge.

Keywords: *knowledge, attitude, health behavior, children, autism.*

Introduction

Autism Spectrum Disorder (ASD) is a complex developmental disorder of a child's brain function that manifests in impaired communication and interaction, repetitive behavior, impaired non-verbal communicative behavior, and problems in developing, maintaining and understanding relationships¹. The term spectrum describes the varied symptoms, impairment and disability. This spectrum creates the problem to identify children with autism.

There is no data of number of children with autism in Indonesia, but it is believed that the number of cases

has increased². There has been relatively few studies on children with autism in Indonesia³.

Health behavior is a combination of health knowledge, attitudes, and practice that underlie actions taken by individuals regarding their health. The Ministry of Health developed guidance for health behavior called *Perilaku Hidup Bersih dan Sehat*, (PHBS = Clean and Healthy Lifestyle)⁴. It is aimed to build healthy households throughout the Indonesian community.

Healthy lifestyle must be practiced by everyone, including those with autism. There are numerous reports on the health behavior of students without disability^{5,6,7}, but fewer research on the health behavior of children with disability^{8,9}.

This is the first study on the health behavior of children with autism, aiming to assess the knowledge, attitude and behavior of children with autism.

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Methods

This study collected data from all Year 4, 5, 6, 7 and 8 students of Bina Anggita Special School for children with autism in Yogyakarta.

The knowledge, attitude and practice of healthy lifestyle were assessed using a questionnaire. The questionnaire was from a study assessing the healthy lifestyle of primary and junior high school students¹⁰, that has 36 questions divided into three parts: 12 multiple choice questions on knowledge, 12 statements to agree or disagree on attitude and 12 multiple choice questions on behavior. The maximum and minimum scores are 36 and 12 for each section. Interviews with three teachers and two parents were also conducted.

Univariate analysis was performed on questionnaire data. Interview data was used to complement findings from the questionnaire.

Ethical clearance was obtained from the Committee of Health Research Ethics, Faculty of Medicine,

Universitas Kristen Duta Wacana, Yogyakarta, Indonesia.

Results

Thirteen children with autism participated in this study. There were ten boys and three girls aged 11–17 years. Data were collected by interviewing each child individually to fill in the questionnaire. Communication was a challenge, so besides verbal communication, the researcher used many aids like pictures or real utensils, such as soap, toothbrush to obtain answers to the questions in the list.

Health Knowledge

The scores ranged from 24 to 34 with a mean and standard deviation of 30.85 ± 3.11 . A further analysis was conducted to investigate each question to find out which questions had high percentage of children who answered correctly, as presented in Table 1.

Table 1. Questions and percentage of children with correct answer to questions on health knowledge

No	Questions	Percentage of children with correct answer
1.	The importance of handwashing using soap	85
2.	Showering frequency in one day	100
3.	The importance of brushing your teeth	77
4.	Frequency of brushing teeth in a day	94
5.	Time to wash hands using soap	54
6.	Long and dirty nail's relation to worm	31
7.	Causes of stomachache	62
8.	Definition of balanced nutrition	69
9.	Healthy toilet criteria	54
10.	The place to throw garbage	85
11.	Reasons for hair washing	62
12.	The importance of sleeping	23

There were 11 of 12 questions on knowledge that were not fully answered correctly. Three children did not know that soap was used to remove germs and dirt. Three children thought toothbrushing was aimed only to have good mouth and breath odors. Six children answered that they washed their hands only after eating, not before eating and after defecating and urinating. Only four children knew the connection between long and dirty nails with worm invasion. Some children answered balanced foods were those that could cause satiety. Some children answered they could throw away garbage

to the river. Some children thought that hair hygiene was aimed only to keep hair from lice. The question on the function of sleep received the highest percentage of wrong answer (76.92%). A lot of respondents thought that sleep was aimed to relieve sleepiness.

Health Attitude

The respondents' scores ranged from 30 to 36 with a mean and SD of 33.62 ± 2.06 for attitude. An analysis on the answers to each question was conducted and presented in Table 2.

Table 2. Questions and percentage of children with correct answer to questions on health attitude

No	Questions	Percentage of children with correct answer
1.	Agree / not on eating vegetables and fruits every day	100
2.	Agree / not that nails must be clean and cut short	92
3.	Agree / not on washing hands before eating	100
4.	Agree / not washing hands with soap after bowel and bladder emptying	100
5.	Agree / not to use soap for showering	100
6.	Agree / not to wash the hair using shampoos	92
7.	Agree / not that people should change clothes once every two days	62
8.	Agree / not that rubbish to be stacked in the yard of the house	100
9.	Agree / not that children sleep <8 hours a day	62
10.	Agree / not that exercise decreases body fitness	69
11.	Agree / not if people smoke in the room	92
12.	Agree / not to brush teeth once a day	100

Half questions on health attitude were answered correctly by all respondents. One child did not agree that fingernails should be kept clean. One child did not agree that hair should be washed using shampoo. Some children agreed that clothes should be changed once

every two days. Some children had difficulty in sleeping, so they agreed that good sleep was less than 8 hours. Some children agreed that exercise could decrease body fitness because they became tired when exercising. One child agreed that people could smoke in the room

because he did not understand the bad effects of smoking.

Health Practice

The health practice scores ranged from 28 to 36 with a mean and SD of 33.31 ± 2.20 . The children's answers to each question were analyzed and the results are found in Table 3.

Table 3. Questions and percentage of children who provided correct answers to questions on health practice

No	Questions	Percentage of children with correct answer
1.	Where to throw garbage	100
2.	Shower frequency in a day	92
3.	How often do you wash your hands with soap	92
4.	The frequency of tooth brushing in a day	92
5.	How to clean hair	85
6.	Frequency of eating vegetables in one week	77
7.	Frequency of eating fruit in one week	38
8.	Length of sleep in one day	54
9.	Place for defecation and urination	100
10.	Change clothes every day	100
11.	Wash hands with soap after bowel and bladder	77
12.	Frequency of exercise a week	62

Three of 12 questions on the health behavior of children with autism were answered correctly by all children. One child took a shower only once a day because he was too lazy to take a shower twice a day. Another child did not use soap in hand washing because he did not see the benefit of using soap. A child brushed teeth once a day because he was too lazy to brush teeth more often. Some children ate vegetables only once to three times a week because they did not like vegetables, and there were children who never consumed fruits as they did not like fruits. Some children slept less than eight hours and some did not sleep at regular time. They said that they could not sleep or were still occupied with something they liked. Some children washed hands after bowel movements and urination, but not before and after eating. Some children rarely exercised because they

were tired of the activities.

Interview with teachers

Three teachers were interviewed. They said that children with autism had to practice healthy lifestyle at a very young age so that they would automatically do it. They also asked parents to assist their children in developing healthy lifestyle. The teachers thought that children with autism needed supervision as despite their age, some children with autism did not realize the danger of some activities, i.e. burning garbage. Some children refused assistance in the implementation of healthy lifestyle. According to the teachers, the students with autism had reasonably good healthy lifestyle.

Interview with 2 parents:

In this study, two parents were interviewed. The first mother said that her health behavior was not as good as when the child was younger. Although the child understood the importance of healthy lifestyle, he was reluctant to practice it. There was rejection from the child when the parents wanted to help the child. The first mother had difficulty in communication with her son, so she trained her son to have healthy lifestyle since the boy was young. She made a daily schedule for her son to do daily activities, so that the child developed routine activities, including developing healthy lifestyle.

The second mother said that her child still had difficulties in practicing healthy lifestyle. The child received help from the mother when taking a shower and needed guidance when washing hands. However, the boy was diligent in brushing his teeth and eating balanced foods even though he did not like fruits very much. The child was happy to change clothes every day and did exercise regularly. According to the second mother, her son's healthy lifestyle was quite good and not different from that of his sister without autism.

Discussion

There were more boys than girls with autism in this study. It is a common finding that there are more males than females diagnosed with Autistic Spectrum Disorder^{11,12}.

The age of the respondents did not correlate with their school year. There were older students in lower grade, and younger children in higher school years. This finding indicates variability in chronological age and mental age especially related to academic achievement, as reported by other researchers. There is great variance in the intellectual capacity among children with autism.

Some respondents did not provide the correct answers to some questions in the knowledge, but they gave correct answers to the related questions in the attitude and practice sections. This finding suggests the success of the teachers and parents to develop good habits despite the children's limited understanding about healthy lifestyle. A number of studies report challenges in educating children with autism, especially managing children's behavior and communicating effectively¹³.

Despite those difficulties, the teachers and parents were able to train the children to have good healthy lifestyle. Continual teaching and training will result in good habit¹⁴.

Although some children with autism did not have proper knowledge, they had good attitude and practice related to healthy lifestyle. There was a possibility that children with autism had good attitude and practice without really understanding the reason behind it. They practiced behavior lifestyle not because they knew the reason for doing it, but because of habits trained by parents and teachers. This was not an easy task for parents. A study reported barriers for parents to develop healthy habits for their children with neurodevelopmental disorders included autism were limited parents' resources, child resistance or behavior related to their neurodevelopmental disorder, lack of supportive program, and medication side effects¹⁵. Despite the barriers, the parents of the children with autism participating in this study were able to train their children to practice healthy lifestyle.

There was one interesting finding regarding the question about sleep, many respondents did not provide the right answer in knowledge, attitude and behavior sections. Sleep problem has been reported to be more commonly found in children with autism^{16,17,18}. A study reported that children with autism had low levels of the hormone melatonin, a hormone that was required for the regulation and maintenance of sleep¹⁹.

The in-depth interviews with parents and teachers revealed that some children with autism did not have the initiative to ask for help when they were not able to implement the healthy behavior and some children refused other people's help when they have difficulties in conducting the healthy lifestyle. Those behaviors were examples of "resistance to change", they wanted to do it their way. "Resistance to change" is one of the core symptoms found in autism²⁰. There are interventions suggested to overcome this problem, including behavioral interventions and food selection^{21,22,23}.

Conclusion

Children with autism can develop healthy lifestyle. There is a discrepancy between knowledge, attitude and practice. Despite limited knowledge, children with

autism have good attitude and practice.

The limitation of this research was the small number of respondents and that it was carried out only in one school.

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Conflict of Interest - Nil

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Clinical Assessment of Surgical Treatment of Neurovascular Compression Syndromes

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Abstract

Background: Neurovascular compression syndrome is a wide variety of clinical syndromes occurring due to the dysfunction of cranial nerves secondary to compression by a vascular loop. Trigeminal neuralgia is the most common example of this condition. Medical treatment, as carbamazepine, has been long prescribed to control such painful condition. Microvascular decompression operation represents a suitable option for many patients that failed to respond to conservative treatment or unable to be compliant to treatment.

In this article, we investigate 20 different neurovascular compression presentations, surgical nuances and outcomes of microvascular decompression as well as providing the surgical, clinical and radiological methods dealing with two most challenging cases to evaluate the efficacy and safety of this procedure.

Abbreviations: CN: cranial nerves; GN: glossopharyngeal neuralgia; HFS: hemifacial spasm; NVCS: Neurovascular compression syndrome; MVD: Microvascular decompression; TN: trigeminal neuralgia.

Keywords: neurovascular compression syndromes; trigeminal neuralgia; glossopharyngeal neuralgia; microvascular decompression.

Introduction

Neurovascular compression syndrome (NVCS) is a wide variety of clinical syndromes occurring due to the dysfunction of cranial nerves secondary to compression. Evidence suggests that the likely etiology is vascular compression at the root entry zone leading to focal demyelination and aberrant neural discharge. Secondary causes such as multiple sclerosis or brain tumors can also produce symptomatic similar diseases.¹

Treatment must be individualized to each patient. Medical treatment as with carbamazepines has been long prescribed to control such painful condition. Many other interventional techniques are described for the control of these conditions. Microvascular decompression represents a suitable option for many patients that failed

to respond to conservative treatment or unable to be compliant to treatment due to side effects.¹⁰

Methods

§ Patients

This study involved twenty patients, in the period between June 2015 and June 2017, presented with variable signs and symptoms of cranial nerve neuropathies. Causes of the condition were described to be due to vascular compression at the brain stem, trigeminal neuralgia (TN), hemifacial spasm (HFS), intractable vertigo, glossopharyngeal neuralgia (GN) and geniculate neuralgia. Patients were admitted and managed at the Neurosurgery department of Cairo University Hospitals, where data collected prospectively while exclusion criteria included tumors, cysts and vascular malformation.

§ Data Collection

Ø History Taking :

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Age, gender, occupation, time of initial complaint till the time of presentation, history of any type of tumors the patient suffered from, history of comorbidities e.g. D.M and smoking.

Ø Clinical Examination :

All patients were clinically evaluated and examined with special care to the **cranial nerve examination** especially Trigeminal nerve (CN V) and Facial nerve (CN VII), motor deficit, or sensory deficit.

Ø Investigations :

a) Routine laboratory investigations.

b) Radiological investigations:

v Computerized tomography (CT) of brain and skull.

v Magnetic resonance imaging (MRI) of brain and cerebellopontine angle.

v Further imaging modalities as fast imaging employing steady-state acquisition (FIESTA sequence) or magnetic resonance angiography (MRA) might also be done when needed.

Ø Management

a) Counseling and Consent.

b) Pre-operative Management :

prophylactic antibiotics were given.

c) Operative Management : All 20 patients underwent microvascular decompression (MVD) surgery. Exploration of the cerebellopontine angle (CPA) is performed through retrosigmoid approach in $\frac{3}{4}$ prone or lateral decubitus position. The margins of transverse and sigmoid sinuses are minimally exposed and the angle between them is well identified. The dura is opened along the line bisecting its angles. Mastoid air cells, whenever encountered, are immediately sealed with muscle and bone wax in order to avoid postoperative cerebrospinal fluid (CSF) leakage. The root entry zone (REZ) at the brainstem is properly explored and the offending vessel is identified. This is helped by observing the characteristic indentation on the corresponding nerve at the REZ and the unique subtle change of color

secondary to possible demyelination of the affected portion of the nerve. After freeing the offending vessel off the REZ of the affected nerve, a potential space is created between them using sharp arachnoid dissection, a proper insulator e.g. Polytetrafluoroethylene (PTFE) felt or Dacron is placed. Further inspection is carried out either with the microscope or with the aid of endoscope to ensure that adequate decompression is done and that no unnecessary vascular loops are still in contact with the nerve

d) Follow up and Outcome :

Outcomes were assessed postoperatively, immediately after recovery, few days postoperatively, on discharge and six months postoperatively.

Facial pain is graded according to the Barrow Neurological Institute Pain Scale;

I. No pain, no medication.

II. Occasional pain, no medications required

III. Some pain, adequately controlled with medications.

IV. Pain, partially but inadequately controlled with medications.

V. Severe pain or no pain relief

Other non-painful conditions were evaluated on a similar 5-tier scale to unify the measuring values:

I. complete improvement, no medication

II. Occasional symptoms, no medications required

III. Some symptoms, adequately controlled with medications.

IV. Severe symptoms, partially but inadequately controlled with medications.

V. Severe debilitating or socially disabling disease.

Complications were carefully followed up, regardless of modality of its management, and evaluated according to a 3-tier scale:

0. No deficits or only slight subjective complaints.

1. Slight cranial nerve or cerebellar dysfunction, not

bothersome for daily life.

2. Both subjective and objective cranial nerve or cerebellar dysfunction, problematic for daily life.

Results

v Patients Data:

60% of included patients (12 patients) were males while 40% (8 patients) were females.

Table (1): Patients Age and Sex

	Age Groups (yrs.)					Total
	1	2	3	4	5	
	< 35	35- 45	45 - 55	55-65	> 65	
Male	2(10%)	1 (5%)	6(30%)	2(10%)	1(5%)	12(60%)
Female	0	4(20%)	3(15%)	1 (5%)	0	8 (40%)
Total	2	5	9	3	1	20
Percentage	10%	25%	45%	15%	5%	100%

v Clinical Presentation:

a) Duration of symptoms: 14 patients (70% of cases) had the clinical symptoms of NVCS for 5 years or less while 6 patients (30%) indicated that the symptoms lasted for more than 5 years, with an overall arithmetic mean of 45.65 months and a median of 42 months prior to surgery.

b) Laterality of the disease: About 65% of patients (13 cases) were affected with the right-sided NVCS, and the rest percentage represents 35% of patients (7 cases) had left sided complaint.

c) Affected nerve root, typical and atypical presentations:

Trigeminal nerve was the mostly affected cranial nerve reported in 17 cases (85%), followed by facial nerve in 2 cases (10%) with hemifacial spasm and 1 case (5%) with glossopharyngeal neuralgia. However, Trigeminal nerve roots were affected variably among TN patients. 8 patients experienced symptoms related to mandibular division V3 (7 patients with typical TN symptoms and 1 patient with atypical symptoms of burning sensation and

pain that persisted between the attacks), 7 patients had symptoms related to both mandibular V3 and maxillary V2 divisions and only 2 patients experienced affection of the whole 3 divisions of trigeminal nerve as shown in figure (1).

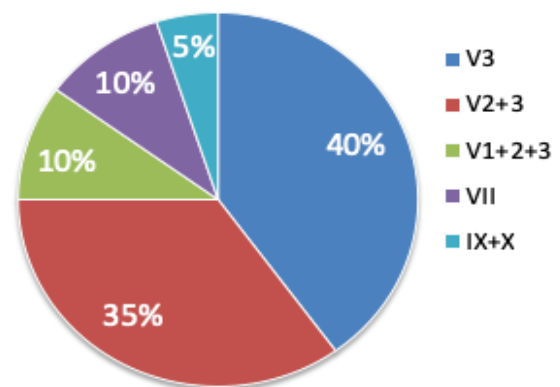


Figure (1): Distribution of NVCS patients in regard to affected cranial nerves.

V: Trigeminal nerve; VII: Facial nerve; IX+X: lower cranial nerves

(IX: Glossopharyngeal nerve; X: Vagus nerve)

Overall, the majority of patients in the study, 17 cases (85%), had typical presentations of NVCS and only 15 % of the cases had atypical form of presentation either objectively in symptoms or subjectively during the neurological assessment done after admission (table 2).

Table (2) Distribution of NVCS patients in regard to affected nerve root, typical and atypical clinical presentations.

Affected Nerve		Clinical Presentation		
		Typical (%)	Atypical (%)	Total (%)
Trigeminal (V) Nerve	V3	7 (35%)	1(5%)	8 (40%)
	V2+3	7 (35%)	0	7 (35%)
	V1+2+3	1 (5%)	1 (5%)	2 (10%)
Facial Nerve		1 (5%)	1 (5%)	2 (10%)
Lower Cranial Nerves		1 (5%)	0	1 (5%)
Total		17 (85%)	3 (15%)	20 (100%)

d) Severity of illness: All patients had severe intractable disease graded by a 5-tier scale, as discussed earlier, upon their admission. Majority of patients (60%) were graded four out of five with symptoms that decreased by medical treatment but yet inadequately as the disease was still incapacitating. However, only 8 patients (40%) had unimproved symptoms with any conservative treatments.

v Intraoperative Findings:

The offended vessels were identified in figure (2) as follows:

1) Superior cerebellar artery (SCA) in 11 cases (55%) with TN, about 64.7% of them were presented with the same manifestation of the disease.

2) Anterior inferior cerebellar artery (AICA) in 5 cases (25%). About four cases of them represent (23.6%) of total number of TN patients.

3) Posterior inferior cerebellar artery (PICA) in 2 cases (10%) with hemifacial spasm for one patient (5%), and glossopharyngeal neuralgia for the other one (5%).

4) One case of TN (5.8% of TN patients and 5% of the total number of cases) had a venous loop as the compressing vessel.

5) Last patient showed a compression by ectatic vertebrobasilar artery (VBA) (5.8% of TN patients and 5% of the total number of cases).

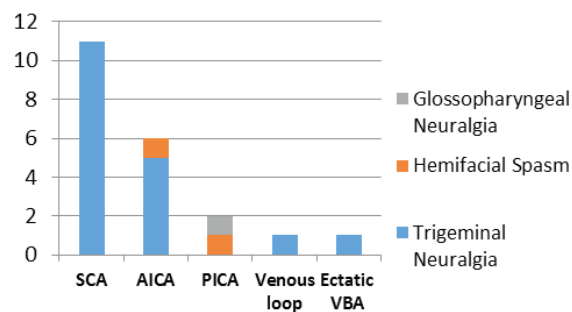


Figure (2): Offending vessels as seen microscopically intraoperatively.

SCA: Superior cerebellar artery; AICA: Anterior inferior cerebellar artery; PICA: Posterior inferior cerebellar artery; VBA: Vertebrobasilar artery

v Postoperative Outcomes:

Upon discharge; complete recovery was reported in 70% of patients with an excellent disease control at discharge with no need of further medications, a lesser control of the disease was reported in 25% of the patients who showed sporadic symptoms that didn't require the use of medications while the remaining 5 % of patients needed a small dose of medications to control recurrence of symptoms.

Six months follow up reported decreased percentage of patients experienced symptoms of recurrence (from 35% to 5%) with no drug dependency, indicating that percentage of symptom-free patients raised to 90% and only 5% of cases still needed control with medications.

Non-specific complications, as postoperative minor headache and nausea, were insignificant to our study and self-limiting. Significant complications were encountered in 5 patients with no reported mortalities:

- 1 patient experienced postoperative disequilibrium and posterior fossa venous insufficiency symptoms.
- 2 patients had partial facial palsy (H&B Grade II and III respectively) that completely resolved in one patient and persisted in the other one.
- 1 case had postoperative tinnitus and sensorineural hearing loss.
- 1 case had CSF leak that was managed initially with conservative measures and failed, then was treated by temporary lumbar subarachnoid drain insertion for two days.

Case Presentation

Case (1)

A 59 years old male presented with an eight year recurring left sided facial pain, fitting the clinical picture of typical TN affecting both mandibular **V3** and maxillary **V2** distributions. Carbamazepine was taken to the maximum dose with only partial relief. The patient tried percutaneous injection that provided only temporary relief of the symptoms.

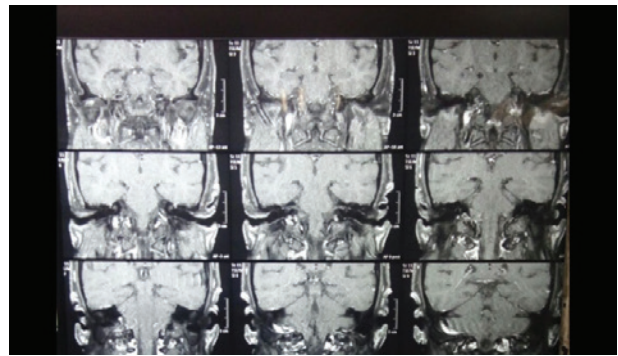


Figure (3): Patient (1) MRI/ T1WI coronal cuts shows no structural lesions affecting trigeminal nerve

Patient was operated upon by microvascular decompression of the left trigeminal nerve. The offending vessel was found to be the **superior cerebellar artery (SCA)**. It compressed the nerve from the medial and anterior aspects.

Case (2)

A 37 years old male patient presented with gradual onset and progressive course of involuntary, irregular, clonic movements of the right sided facial muscles. It initially involved the orbicularis oculi muscle, followed by gradual spread to the other parts of face. The patient was experiencing more than twenty attacks per day and each one lasts for about one minute the thing that disabled him socially. The complaint lasted for three and a half years during which he sought medical advice and was prescribed medical treatment and a trial of botulinum toxin injection was done; however, the improvement was unremarkable. He had no relevant medical or surgical history and no special habits of medical importance.

MRI neuromaging showed no tumors, cysts or malformations that could cause the condition (figure 5).



Figure (4): Intraoperative findings in patient (1)

A: Shows the **superior cerebellar artery** (black arrow) compressing the **left trigeminal nerve** (white arrow) at the root entry zone; B: Sharp arachnoid dissection is carried on; C: Insulator was put in the plane created between the nerve and the vessel; D: Final exploration of the root entry zone.

The patient went through a smooth postoperative period with an improvement of pain to VAS score 2. No postoperative complications were recorded apart from mild headache. Patient complete recovery was recorded with one week and six months postoperative follow-up with no neurological deficits.

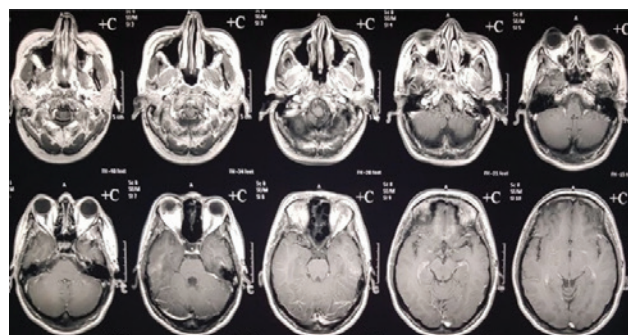


Figure (5): Patient (2) MRI Brain T1WI for exclusion of any tumors that could cause the hemifacial spasm

The nerve was found to be compressed medially by the **anterior inferior cerebellar artery (AICA)**. Dissection of the artery off the nerve and an insulator was put to ensure the new position of the artery. Endoscopy was used to explore the root entry zone to ensure adequate decompression. **Another loop** of the same artery was found using the 30 degree-angled lens and additional maneuver using insulator was performed. (figure 6).

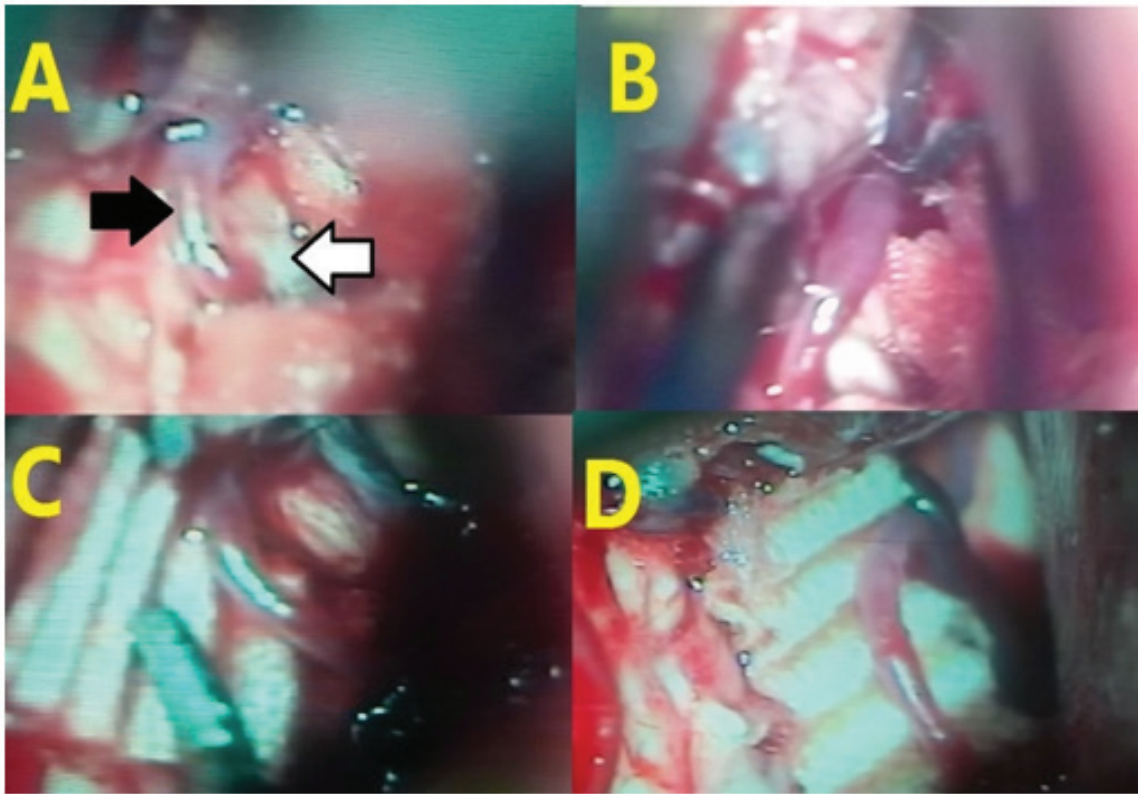


Figure (6): Patient (2) facial nerve decompression. The facial nerve (white arrow) is being compressed at the root entry zone by anterior inferior cerebellar artery (white stars).

Immediate postoperative period was smooth with no postoperative complications. The patient had partial improvement of the condition immediately postoperatively with preserved full facial functions.

One week, one month and six months postoperative patient follow-up showed good wound healing, more improvement of the condition and complete resolution of the abnormal movements respectively.

Discussion

This study included 20 patients presented at Cairo University Hospitals with the clinical syndromes of neurovascular compression of cranial nerves at the brain stem. Male to female ratio was 1.5:1, indicating male predominance. However female patients were presented at younger ages than males. This finding is quite similar to that indicated by *Jagannath et al* who conducted a prospective study, on 182 patients underwent MVD operations and included 84 males (61.3%) and 53

females (38%) with a ratio of 1.5:1. Nevertheless, this finding is contradicted by other studies who indicated predominance of females and a higher means of ages at the time of presentation.^{11,12}

35 % of the total cases and 41.1% of total number of patients of trigeminal neuralgia had symptoms related to both the mandibular V3 and maxillary V2 nerves distribution, while only 2 patients experienced a disease that affected the whole distribution of the trigeminal nerve with a percentage of 10% of the total cases and a percentage of 11.7% of the total cases of trigeminal neuralgia. This study also included 2 cases of hemifacial spasm with a total percentage of 10% and a case of glossopharyngeal neuralgia with a percentage of 5%.

Jagannath et al, in their study in 2012, found that the mandibular V3 and maxillary V2 divisions of the trigeminal nerve predominated with about 68% of the cases.¹¹ Another study, *Sandel and Eide* in 2013 published a retrospective review article of patients with

typical and atypical presentations; 65 % of trigeminal neuralgia patients were without constant pain and 35 % were with constant pain while for hemifacial spasm patients the percentage of division between the two groups was 95 % for typical presentation and 5 % for atypical disease.¹³ Whereas, the duration of symptoms prior to NVD surgery according to *Slettebo and Eide*, ranged from 5 to 10 years with median of 7 years and all of the study's patients had typical presentation of the disease.¹²

During our surgical procedures, the offending element had been identified as follows; 55% was the superior cerebellar artery (SCA) all of which were cases of trigeminal neuralgia, the anterior inferior cerebellar artery (AICA) with a percentage of 25% of the cases. 10% cases were found to have the posterior inferior cerebellar artery (PICA) as the offending vessel. A venous loop as the compressing vessel represented only 5% of the total number of cases and 5.8% of total number of trigeminal neuralgia cases, 5% of cases also showed compression by an ectatic vertebral-basilar artery (VBA). As for other authors' experiences with offending vessels, *Jagannath et al* found that the superior cerebellar artery was the commonest cause of compression in 71.5% and more than one artery were found in relation to the nerve in 15.3%.¹¹ While according to *Zhong et al.*, the offending vessels were observed to be arteries, artery combined with vein or veins only. Comparatively to our study, more than one offending vessel were found (74%), which included (SCA, 41%), (AICA, 29%), petrosal vein(s) (35%), (PICA, 9%) and vertebral artery (VA, 6%).¹⁴

While most patients in our study had excellent disease control at discharge as 70% were being completely symptom-free with no need of further medications (GI), and 25% of the patients showed a lesser control of the disease having sporadic symptoms that didn't require the use of medications (GII), while the remaining 5 % of the patients showed less favorable outcome with the need for medications, nevertheless, in a small dose to control recurring those symptoms (GIII). Six month follow-up, the percentage of patients that experienced recurrence of symptoms with no drug dependency dropped from 25% to 5% and the percentage of symptom-free patients raised to 90% of the patients, while 5% of the cases still were dependent on a low dose of medications. Similarities

were found between our results and previous ones. *Zhong et al.* recognized that pain free or spasms cease occurred in 88.3%, improved at some degree in 7.2% and the symptoms were unimproved at all in 4.5%.¹⁴ Another study was for *Sandel and Eide* in 2013, where 54.4 % of the hemifacial patients reported immediate spasm relief after MVD. Within 3 months, 75.4 % had improved and 7% of the patients reported that their symptoms relieved more 6 months after surgery.¹³ Recently, *Wang et al.* concluded that out of the 55 patients included in their study, 39 patients (76.5 %) had achieved control of their pain, 34 (67.7 %) being totally pain-free (BNI I) with an excellent result of the procedure and five having a good result while still experiencing some forms of mild pain but not requiring any medication (BNI II). For these 39 patients, relief was immediate in 29 (74.3 %) and delayed in 10 (25.6 %). Outcome was not satisfactory in the 16 other patients (29 %). four patients had a recurrence of pain with a 3.9 years average lapse (range 1.7-5.7 years). Of these 16, four patients underwent a second procedure: thermo-rhizotomy in three and balloon compression in one.¹⁵

On the basis of our experience and a review of literature, we conclude the following:

- 1- The diagnosis of neurovascular compression syndromes is made on a clinical basis; however, modern imaging techniques can be beneficial in visualizing the vessel-nerve conflict
- 2- Microvascular decompression is relatively safe and cost-effective procedure that provide both satisfactory and long standing results.
- 3- Proper anatomy knowledge is crucial to surgeons performing this operation.
- 4- Although the operation carries morbidities, most of them are not serious and usually transient and well controllable.

Auxiliary tools such as endoscopies and intraoperative neurophysiologic monitoring are gaining more and more importance in the management and reducing the complications of these operations

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Risk Assessment and Management of Exposure of Health Care Workers In The Context of COVID-19 According to WHO in Egypt

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Abstract

Background: Infection prevention and control strategies of WHO to prevent transmission of COVID-19 in health-care settings comprise the following: early finding, source, organizational, and environmental controls, and Personal Protective Equipment (PPE). WHO reported on 22 April 2020 that established three congresses: Personal Protection Equipment (PPE), Diagnostics and Clinical care to report global market shortage for critical supplies required for the global COVID-19. The aim of the current study to evaluate risk assessment and management of exposure of health care workers in the context of COVID-19.

Research Design: A prospective, descriptive research design was utilized in this study. A random sample of 230 responds of HCWs, via an internet survey. **Tool:** one tool was used; risk assessment and management of exposure of health care workers in the context of COVID-19. **Results:** The study reported the high-risk of COVID-19 to three clusters: 1st group who didn't wear PPE with infected cases (20%), 2nd group of HCWs who used a PPE but not with all cases or contact with the environment of patients, (20 to 35 %) and 3rd group (34%), of high risk who exposed to accident biological material during interaction with a COVID-19 patient. WHO surveillance raises the staff's attention to PPE management and recommendation.

Recommendations: Health care sitting should Provide her staff with enough PPE, and demonstrate the purpose and use of each PPE. Update the policy of PPE according to WHO recommendations.

Keywords: Risk Assessment, Health Care Workers, COVID-19, PPE

Introduction

On Feb 14, Egypt announced its first COVID-19 case. Then, Egypt claimed preventive measures. Limited lockdown starting on March 25, Nasopharyngeal swabs from symptomatic patients and contacts of confirmed cases drew in the earlier 2 weeks. Body temperature and clinical assessment were done as screening at the airport⁽¹⁾.

Hospitals play an essential role within the health system in providing essential medical care to the patients and the community⁽³⁾. Extensive outbreaks can lead to

the progressive spread of infection and disease with rapidly increasing service demands that potentially submerge the capacity of hospitals and the health system at large ⁽²⁾.

During the current outbreak of COVID-19, support services and supplies would potentially critical the providing of acute health care by an unready health-care facility⁽⁵⁾. Besides, a high rate of staff absenteeism and turnover can be expected. A shortage of pivotal equipment and supplies could limit access to needed care and have a direct impact on healthcare service⁽⁶⁾. Even for a well-prepared hospital readiness, make more precautions, protect the health care team that closed contact with patients, and coping with the health outcome of a COVID-19 outbreak would be a complex challenge⁽⁴⁾. The proactive and systematic application of specific actions can facilitate effective hospital-based direction during a rapidly evolving outbreak⁽³⁾.

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Present investigations suggest that the virus that causes COVID-19 is transmitted between individuals through close contact and droplets⁽⁸⁾. Individuals most at risk of acquiring the disease are those who are in contact with or care for patients with COVID-19. This inevitably organizations of health care workers (HCWs) at high risk of infection⁽⁹⁾. Protecting HCWs is of top importance to WHO⁽⁴⁾.

The use of personal protective equipment and clothing should be carefully considered since resources are currently in short supply⁽¹⁾. Surgical masks, in particular, are utilized widely within the general population but have not been clinically proven to reduce or prevent the acquisition of COVID-19⁽³⁾. Within the hospital setting, however, high-filtration masks including N95, goggles, and gowns should be worn by healthcare professionals working in direct contact (within 1-2 meters) of infected patients⁽⁷⁾.

Justification of the study

Occupational risks are demonstrating during the initiatory stages of the COVID-19 outbreak. Healthcare workers (HCWs) more risks for infection with COVID-19⁽⁹⁾. HCWs who regularly came into contact with patients with suspected COVID-19. The researchers introducing this study attempts to evaluate risk assessment and management of exposure of health care workers in the context of COVID-19

Aim of the Study

The aim of the current study to evaluate risk assessment and management of exposure of health care workers in the context of COVID-19

Research Questions

- What are the risk groups of health care workers who exposed to in the context of COVID-19?

SUBJECTS and METHOD

Research Design:

A prospective, descriptive research design was utilized to achieve the aim of the current study.

Setting:

The study surveillance was conducted to cover Giza

city hospitals, that has emergency room which services a critical case, it is for non-quarantine services.

Subjects:

It was a random sample included all health care workers (staff nurses, Radiology Technicians, Laboratory technicians, Respiratory therapists Nursing assistants, and physicians). The E-mail was sent to a list of graduated staff from faculty of applied medical science. 230 responses were collected out of 600 surveillance forms sent.

Data Collection Tools:

Tool 1: risk assessment and management of exposure of health care workers in the context of COVID-19:

It is classified into two parts:

Part one: personal datasheet

It was used to collect data about the personal data characteristics of the study participants. It included items related to such as age, gender, qualification, years of experience.

Part two: risk assessment and management of exposure of health care workers in the context of COVID-19 was developed by WHO⁽¹⁰⁾.

It used to collect the data concerning risk assessment and management of exposure of health care workers in the context of COVID-19. The questionnaire includes four dimensions measured by (18 questions) as **HCW activities performed on COVID-19 patient in health care facility** dimension with a total of (5 questions); **adherence to IPC procedures during health care interactions** dimension with a total of (7 questions); **adherence to IPC measures when performing aerosol-generating procedures** (6 questions); and **accidents with the biological material** dimension with a total of (1 questions). Responses for all dimensions were measured yes or no or Always, as recommended, Most of the time, Occasionally and Rarely.

Tools validity and Reliability

Validity:

Study tool content validity was done, to examine the instrument for content, coverage clarity, wording,

length, format, and overall appearance.

Reliability:

The reliability test was estimated using Cronbach’s Alpha Coefficient for the tool was used to measure the internal consistency of the items composing each dimension of the tool.

Pilot study:

The pilot study was carried out on (10%) of the current sample to ensure the clarity and applicability of the items, and to estimate the time needed to complete the questionnaire. Filling the questionnaires was ranged between 7-15 min. Based on the pilot study analysis no modifications were done in the questionnaires. So, a number of the pilot study was included in the total number of the study sample.

Ethical Consideration:

The aim of the study had been explained to the HCW

included in the study, through the E-mail. They were volunteers, allowed to refuse or to participate, and they were assured that their information will be confidentially utilized and used for the research purpose only.

Procedure

- The list of participants e-mail was prepared at Microsoft sheet.
- the researcher using the Cover page attached to E-mail. (Aim of study and approval consent)
- Data were collected in nearly one month from 28 March 2020 to 26 April 2020.

Statistical design

Data were tabulated and analyzed by the google sheet.

Results

Part I: personnel characteristic of study sample (230) health care workers

Table (1) Distribution of the personal data regarding to study participants (n=230)

Personal data	Study participants (n=230)	
	No	%
Age		
· 20-30 yrs.	204	88.7
· >31	26	11.3
Mean+ SD	28.04+ 10.49	
Gender		
· Male	107	46.5
· Female	121	53.5
Educational Qualification		
· Diploma Degree	0	0.0
· Technical Institute	0	0.0
· Bachelor Degree	230	100
Years of Experience		
· 1-10 yrs.	218	94.8
· 11-21 yrs.	12	5.2

Table (1) shows that the majority of study participant (88.7%) have age ranged from (20-30) years old. Regarding their gender, more than half (53.5%) of them are females. Concerning the educational qualifications all study participants (100%) have Bachelor degree. Also, the majority of sample (94.8%) have 1-10years of experiences.

Figure (1): Shows that health care workers participated in risk assessment survey which 27.9% are Nursing Staff, 29.7% Radiology Technician, 23.6% laboratory Technician, 17.5% Respiratory therapist, and 3.3% physicians.

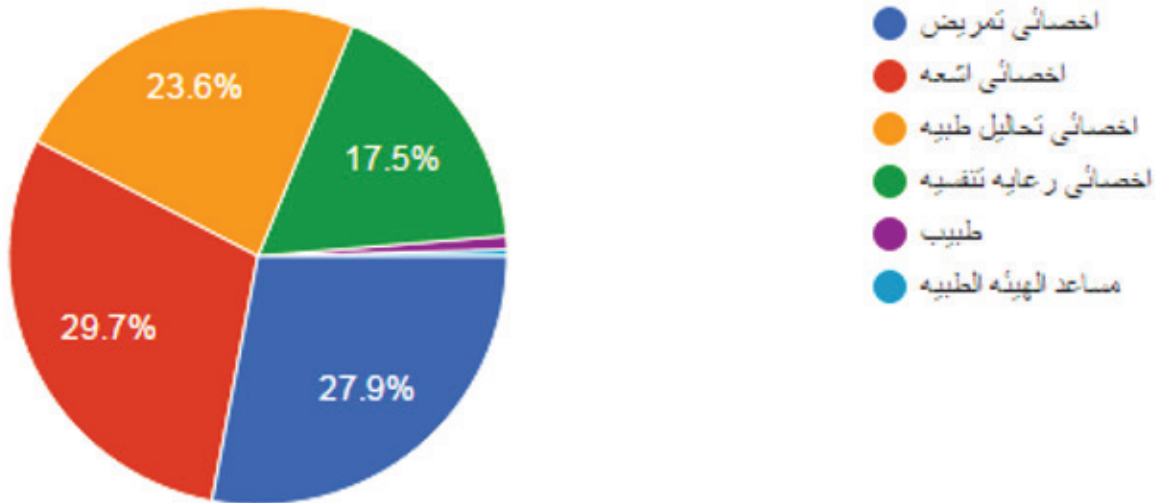


Figure (1): Distribution of study participants regarding their jobs (n=230)

Part II:

Health care worker activities performed on COVID-19 patient in a health care facility:

1. **Figure (2):** Illustrates that 13% of study participants are provide direct care for a confirmed COVID-19 patient.

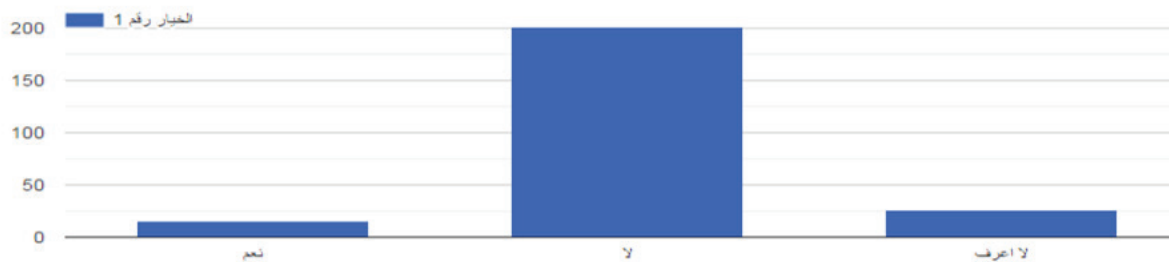


Figure (2): Distribution of study participants regarding direct care with COVID-19 patient (n=230)

2. **Figure (3):** Illustrates that 17 % of study participants are risk because they had face-to-face contact (within 1 meter) with a confirmed COVID-19 patient in a health care facility.

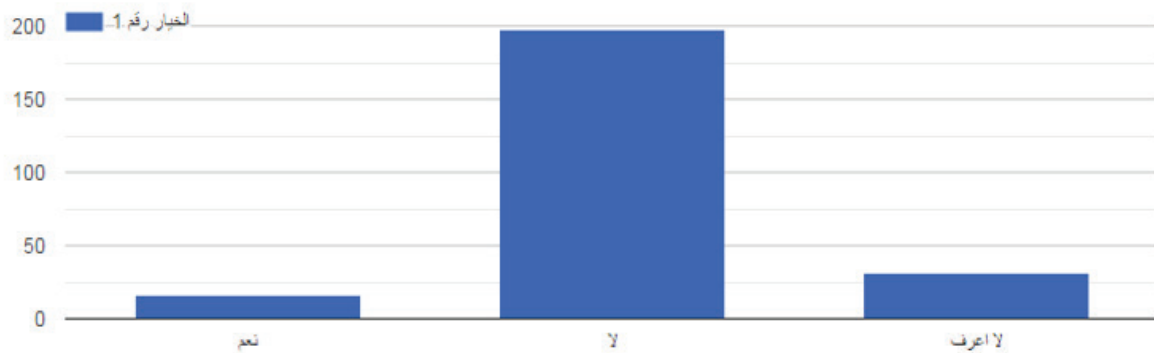


Figure (3): Distribution of study participants regarding face-to-face contact with COVID-19 patient(n=230)

3. **Figure (4):** Shows that 20% of study participants are high risk because exposed to COVID-19 patient's without PPE.

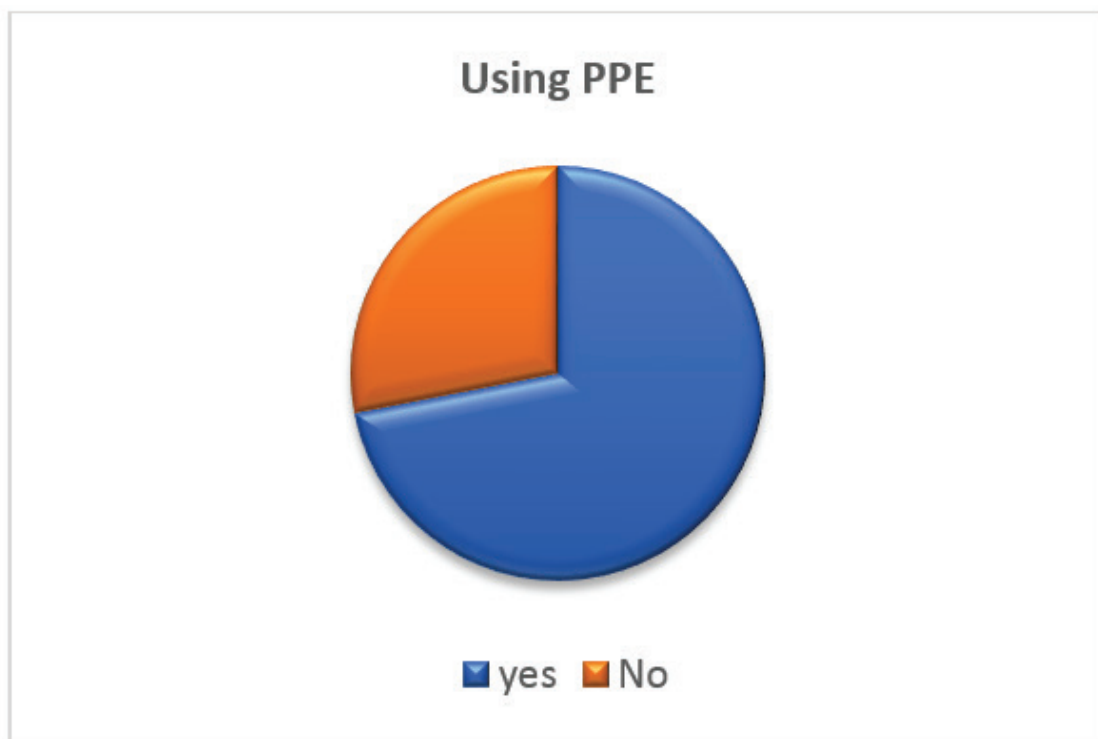


Figure (4): Distribution of study participants regarding high risk(n=230)

Part III:

Accidents with biological material (During a health care interaction with a COVID-19 patient, have any type of accident with body fluid/respiratory secretions)

4. **Figure (5):** Displays that about one third of the sample (34%) have accident with biological material.

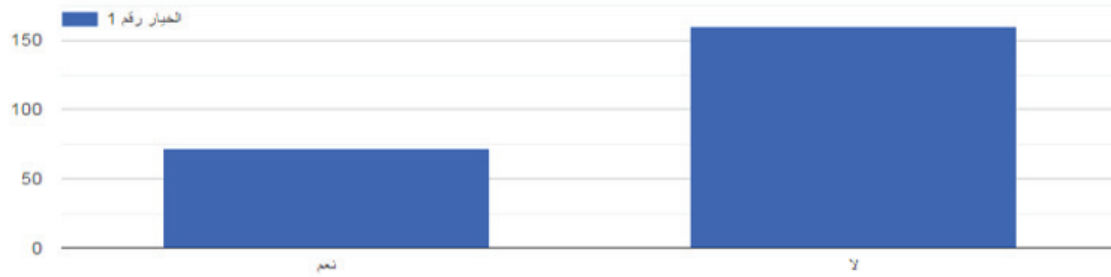


Figure (5): Distribution of study participants regarding an accident with biological material(n=230).

Discussion

In China, December 19 start the spread of Pneumonia disease among people with unknown etiology in Wuhan City. Soon discover the causative agent as a novel coronavirus and named by the World Health Organization (WHO) by COVID- 19⁽¹¹⁾.

The outbreak of COVID 19 showed that hospital setting hasn't enough Personnel protective equipment (PPE), shortage of staff, poor sleeping due to increasing of working hours and working pressure associated with a high risk of COVID-19 at the hospital sitting among health care workers especially no clear evidence of transmission mode of Virus infection⁽¹²⁾.

In the current study, show high-risk exposure of Health Care workers (HCWs) to COVID -19 during providing direct care to infected patients. PEE using frequency according to WHO recommendations weren't clear. The surveillance is done at the acute hospital for Non-quarantine hospitals as observed that most of the infected hospital staff were detected from some hospitals for example (Souad Kafafi Hospital detected three from her HCWs, and Cancer institute's hospital had twenty-three HCWs were infected at Cairo city). It was experiential also that HCWs could infect each other during daily activities.

Through 230 respondents out of 600 questionnaire surveys sent via the internet remained very low, particularly the physician rate might be due to shortage of staff and workload pressure during outbreak disease. The response distribution among HCWs very close at

the rate and all of them have the same risk to expose COVID-19 patients.

The current study reveals that 13% of Health care worker was providing direct care to a confirmed COVID-19 patient and 20% not sure during the period of the research study (one month).

The study report that there were three groups of HCWs high risk due to different ways: 1st group who didn't wear PPE during providing direct care to infected cases, that is 20%, It might be due to shortage of PPE at the hospital sitting, unclear policy, or work overload but could be also that HCWs didn't aware enough by the transmission mode for began of outbreak disease and delay of WHO recommendation.

2nd Group of HCWs who used a PPE most of the time (it means 50% or more but not 100%) for single use of Gloves, medical mask, and Gown. These groups range from 20 to 35%, these reveal to some hospital sitting don't have enough supplies of PPE. During a health care interaction with the COVID-19 patient, the same percentage also for HCWs who didn't remove and replace PPE according to the protocol (e.g. when medical mask became wet, disposed of the wet PPE in the waste bin, performed hand hygiene, etc.

Also, Health care workers who had direct contact with the environment where the confirmed COVID-19 patient was cared for (bed, linen, medical equipment, bathroom, etc.) Most of the time wear PPE but not almost.

On another hand, HWCs who performing aerosol-generating procedures (e.g. tracheal intubation, nebulizer treatment, open airway suctioning, collection of sputum, tracheotomy, bronchoscopy, cardiopulmonary resuscitation (CPR), etc.). Most of them perform open airway suction and 50% only wear N95 masks during the procedure.

The last group, of high risk who an accident had biological material during a health care interaction with a COVID-19 patient, with body fluid/respiratory secretions. The present study report that 34% of HCWs were exposed to respiratory secretion during providing direct care to infected cases. The person to the Person spreading of the virus occurs due to direct contact with an infected case, exposed to coughing, sneezing, respiratory droplets, or aerosols. These aerosols can penetrate the human body (lungs) via inhalation through the nose or mouth⁽¹³⁾.

It was expected particularly most of the cases enter to the Emergency room (ER) with regular signs and symptoms of pneumonia and not confirmed COVID-19. Such cases go into a regular investigation and examination procedures at the ER. Non-confirmed cases could be more dangerous than confirmed as the length of stay at ER or General ward without Isolation protocol may lead to an outbreak at hospital staff. Also, the Ministry of Health distributes its guidelines \ protocol for dealing with suspected cases in March 2020 after an outbreak among HCWs. The clinical manifestations of COVID-19 are variable, which include an asymptomatic carrier, Acute respiratory diseases (ARD), and pneumonia of varying degrees of severity. Primary, the cases were diagnosed based on positive viral nucleic acid test results, but without any COVID-19 symptoms, such as fever, or respiratory symptoms, and no significant abnormalities on chest X-ray, However, the transmission of COVID-19 through asymptomatic carriers via person-to-person contact was identified in many studies⁽¹⁴⁾.

Above and beyond, WHO surveillance was including all updated management recommendations that raise the awareness to all participants through questions form so they can detect the mistake could fail into. This led them to review their policies to be matching with WHO recommendations ⁽¹⁵⁾. Patient safety and staff safety

comes first.

Recommendations:

- o Health care setting should Provide her staff with enough PPE.
- o Demonstrate the purpose and use of each PPE.
- o Update the policy of PPE according to WHO recommendation.
- o Using PPE as a routine with all cases (Confirmed and Non-confirmed COVID-19) and replaced or removed according to WHO recommendation.
- o Hand washing before and after contact with patients or patient environment.
- o Using PPE through contact with the environment where the confirmed COVID-19 patient was cared for.
- o Stop working for 14 days after the last day of exposure to a confirmed case and be tested for COVID-19 (according to WHO recommendations).
- o Quarantine for 14 days in a nominated setting to HCW after confirmed with COVID-19. (According to WHO recommendations).

Conclusion

The current study conducted via an internet survey for 230 HCWs who work at hospitals of Giza city and used WHO assessment of high-risk for March 2020. The present study reported the high-risk of COVID-19 to three clusters: 1st group who didn't wear PPE with infected cases (20%), 2nd group of HCWs who used a PPE but not with all cases or contact with the environment of patients, (20 to 35 %) and 3rd group (34%), of high risk who exposed to accident biological material during interaction with a COVID-19 patient. Besides, WHO surveillance raises the staff's attention to PPE management and recommendation.

Ethical Clearance: It doesn't require because there is no any experimental data collected as well no health care institution mentioned. The data is collected from Health care workers in different hospitals in Giza city; exists their personal opinion which does not violate the ethical standards.

Source of Funding: Self

Conflict of Interest: Nil.

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Effects of Fifa 11+ on Body Composition in Obese Women

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Abstract

Background/Objective: Studies dealing with the effectiveness of the Fédération Internationale de Football Association (FIFA) 11+ prevention program to improve body composition outcomes in obese women aged 30-40 years are limited. This study aimed to point out the effects of the application of FIFA 11+ warm-up program on body composition in obese women.

Methods: Participants were 54 obese women, divided into a FIFA 11+ (n = 27; mean (SD) age: 35.29 (2.90) y) and a control group (n = 27; age: 35.29 (2.71) y) and trained for 6 weeks. Before and after the training period, body composition test were assessed.

Results: The results showed that the FIFA 11+ training program group showed a significant improvement in the BMI and body fat but there were no significant time and group interaction effects.

Conclusions: The main findings of this study suggest that just 6 weeks of implementation of the FIFA 11+ improves body composition compared in obese women.

Keywords: FIFA 11+, body composition, obese women

Background

Obese women is a serious public health concern worldwide⁽¹⁾. In Indonesia, women aged 30-40 years had obesity (14.8%) in 2012⁽²⁾. In 2013-2018, these figures had risen to obesity women (21.8%)⁽²⁾, highlighting the need for effective prevention strategies to stem, and reverse to the growth of obese women in Indonesia. Specifically, with the evidence of a greater burden of obesity in the most disadvantaged in developed countries, obesity-treatment strategies targeting healthy disadvantaged communities are required. In addition, more women suffer the obesity or extreme obesity compared to men⁽³⁾.

Literature regarding lipid profiles also has an impact on obese women. Total cholesterol, triglycerides, and LDL cholesterol is higher in obese women⁽⁴⁾. LDL cholesterol and total cholesterol have a contribution to cardiorespiratory disease and its clinical consequences such as coronary heart disease⁽⁵⁾. The risk of cardiovascular disease is also affected by HDL-C⁽⁶⁾. Low levels of cardiorespiratory fitness (VO_{2max}) and a high percentage of body fat (% BF) are risk factors for many chronic diseases such as diabetes, hypertension, dyslipidemia, and cardiovascular disease that increase risk of morbidity and mortality⁽⁷⁾. Another consequence of low levels of physical activity is poor muscular strength that is an independent risk factor for diabetes and cardiovascular disease as well as all-cause mortality⁽⁸⁾.

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The “11+” program of the Fédération Internationale de Football Association (FIFA) is a very widespread program, aimed at injury prevention⁽⁹⁾. The injury prevention program is created for football, however, it also received attention from other sports⁽¹⁰⁾. As FIFA

11+ may share similarities with aerobic exercise as moderate to higher intensity (> 30-40% VO_{2max}) and 250-300 minutes/week (20 minutes/day) may also be similar⁽¹¹⁾. Acknowledging the similarities and the key elements in FIFA 11+ program, we consider that the program may also contribute to obesity. To our knowledge, the first study with FIFA 11+ applied on obesity revealed performance enhancements in body composition of women.

Thus, this study aimed to analyze effects of the FIFA 11+ on body composition of obese women. Based on current literature, we hypothesize that performing

the FIFA 11 + for 6 weeks may induce improvements in body composition in obese women.

Material and Methods

Participants

The participants who were recruited the obese women aged 30-40 years old from Yogyakarta, Indonesia with recruitment systems through an advertisement placed around Yogyakarta. Fifty-four samples were selected and randomly allocated by a blinded assistant into two groups (Table 1).

Table 1. Baseline characteristics of the participants stratified by group

Characteristics	Intervention n=27	Control n=27
Age (years)	35.29 ± 2.90	35.29 ± 2.71
Weight (kg)	72.41 ± 3.21	72.22 ± 3.36
Height (m)	1.60 ± 0.03	1.60 ± 0.03
BMI (kg/m ²)	28.03 ± 0.75	27.96 ± 1.06
Body Fat (%)	35.61 ± 1.11	35.52 ± 1.62
Waist circumference (cm)	90.11 ± 1.18	89.37 ± 1.75
Systolic (mmHg)	140.18 ± 5.94	137.07 ± 7.62
Diastolic (mmHg)	95.55 ± 3.85	93.92 ± 4.67

mean ± SD

The participants were evaluated against the eligibility criteria to determine if they met the requirements to participate in the study. The inclusion criteria for this study were: 1) to obese women between 30-40 years old, 2) BMI ³ 25-29.9 (Obesity I⁽¹²⁾), 3) physically inactive less than 3 months (exercise ≤ 45 min/session and ≤ 2 times/week). Written informed consent was provided by the participants and all procedures were handled according to the Declaration of Helsinki. The study obtained approval from the ethics committee of Khon Kaen University (Decision number: HE622224).

Procedures

Study design

The randomized controlled trial design was used in this study. The fully eligible participants that participated in the study were randomized and assigned by www.randomizer.org, without any affiliation or acknowledgment of the participants in the control and experimental groups.

Interventions

The assistant of the intervention group was selected to administer the FIFA 11+ during the warm-up with the intensity controlled at the individualized HR, with formal training guaranteed by the researcher. The assistant was selected as the key element to administer the program to reassure a better rate of participants compliance towards the program. Paper and video support was

prearranged for the participants in the intervention group. All participants started in level 1 and evolved to level 2 in three weeks as predicted in the FIFA 11+ manual, meaning that all participants had three weeks of FIFA 11+ in level 3. The average of 20 minutes to complete the FIFA 11+ and short breaks of 1-2 minutes were allowed. Every participant wore a HR monitor (Polar Electro, Finland) during the training. An alarm on the HR monitor was set at ± 5 beats of the target HR to judge the exercise intensity. During the intervention, one doctor and physiotherapist visited the group. The control participants maintained their individual habit of physical activity and did not engage in any prescribed exercise training during the interventions.

Outcome measures

The participants baseline characteristics such as age and dominant leg were recorded with a pre-designed questionnaire⁽¹³⁾. Participants only used minimal clothing (underwear) and jewellery were removed and were advised not to move and not talk during body composition measurements (body weight (kg), fat per cent (%)) using Karada Scan Body Composition HBF 375 (Omron Healthcare, Kyoto, Japan). The BMI/Body Mass Index is calculated by the formula weight/kg divided by height/m that is expressed in squares (kg/m^2). A measuring placed on a measuring tape at the part of the iliac crest to measure waist circumference is measured in centimetres (cm) and the height of the players with the digital stationary stadiometer (DS-103, DongSahn Jenix, Seoul, Korea).

For each testing protocol, all participants received verbal directives and visual demonstrations from the examiner. All tests were performed at the beginning of

the week, after a 48 hour rest period following the last intervention in the end.

Data Analysis

Statistical analysis used SPSS version 20.0 (IBM SPSS Statistics for Windows, IBM Corp, Armonk, New York, USA). Data were expressed as the mean \pm standard deviations (SD). The normality of the data was evaluated using the Kolmogorov Smirnov test. If the normal distribution is found the parametric, the statistics will be used analysis. Independent t-tests will be used to determine differences between baseline values. Differences in means within the intervention and control groups were compared by the paired t-test. One-way analysis of variance (ANOVA) with repeated measure will be used to assess differences between the two groups. If a significant value is observed, Bonferroni posthoc test will be applied. The statistical significance level was set a $p \leq 0.05$ for all analyses.

Results

In the present study, no severe injuries were observed that would influence participation in the study. In body composition, there were no significant time and group interaction effects for the BMI, body fat, and waist circumference in the baseline. However, there were significant time and group interaction effects for the BMI and body fat in the pre-test (3 week) ($p=0.000$), and BMI, body fat, waist circumference in the post-test (6 week) ($p=0.000$) (Table 2). There were also significant difference in between groups comparison between FIFA 11+ in BMI, body fat, waist circumference($p=0.000$) (Table 3).

Table 2. Changes in lipid profiles, body composition, and physical fitness

Variable	Group	Baseline	p	Pre-test (3 week)	p	Post-test (6 week)	p
BMI (kg/m^2)	FIFA 11+	28.03 \pm 0.75	0.793	26.61 \pm 0.56	0.000*	24.79 \pm 0.20	0.000*
	Control	27.96 \pm 1.06		27.72 \pm 1.06		27.72 \pm 1.06	

Cont... Table 2. Changes in lipid profiles, body composition, and physical fitness

Body Fat (%)	FIFA 11+	35.61 ± 1.11	0.809	33.64 ± 0.90	0.000*	31.10 ± 0.90	0.000*
	Control	35.52 ± 1.62		35.18 ± 1.62		35.18 ± 1.62	
Waist Circumface (cm)	FIFA 11+	90.11 ± 1.18	0.075	87.51 ± 1.96	0.288	81.40 ± 2.06	0.000*
	Control	89.37 ± 1.75		88.22 ± 2.15		88.22 ± 2.15	

values are Mean ± SD

*interaction effect between group and time (p < 0.05), tested by paired t test

Table 3. Changes in lipid profiles, body composition, and physical fitness

Variable	FIFA 11+				Control			
	Baseline	Pre-test (3 week)	Post-test (6 week)	p	Baseline	Pre-test (3 week)	Post-test (6 week)	p
BMI (kg/m ²)	28.03 ± 0.75	26.61 ± 0.56	24.79 ± 0.03	0.000*	27.96 ± 1.06	27.72 ± 1.06	27.72 ± 1.06	0.630
Body Fat (%)	35.61 ± 1.11	33.64 ± 0.90	31.10 ± 0.51	0.000*	35.52 ± 1.62	35.18 ± 0.31	35.18 ± 0.31	0.683
Waist Circumface (cm)	90.11 ± 1.18	87.51 ± 1.96	81.40 ± 2.06	0.000*	89.37 ± 1.75	88.22 ± 2.15	88.22 ± 2.15	0.062

Values are Mean ± SD

*Interaction effect between group and time (p < 0.05), tested by repeated measure analysis of variance

Discussion

Despite the great success of the FIFA 11+ injury prevention program, it was difficult, in practical terms, to persuade obese women to apply for this program regularly solely to prevent injuries and healthy, so the aim was to prove that it also has a positive and direct

impact on obese women’s body composition. The findings of the current study indicate that the training stimuli provided by the implementation of FIFA 11+ three times per week for six weeks appear to be sufficient to elicit significant improvements in body composition.

It is well documented that regular aerobic exercise training reduces body mass by increasing the amount of calories expended⁽¹⁴⁾. On the other hand, studies on FIFA 11+ programs performed 3 times per week for a period of 6 weeks in obese women have demonstrated consistencies in their findings concerning body composition, specifically body mass(15–20). Keating et al.⁽¹⁵⁾ and Wallman et al.⁽¹⁶⁾ found a significant reduction in body mass with exercise programs in obese women. In comparison, Trapp et al.⁽¹⁹⁾ found a significant reduction in body mass with 15 weeks of exercise programs in young women. Although there was no statistically significant difference in calorie expenditure between the two interventions. Furthermore, a significant change in body mass in the FIFA 11+ group may be attributed to an increase in muscle mass⁽²¹⁾. This suggests that leg muscle mass was increased due to the nature of treadmill incline running during the FIFA 11+ program, therefore compensating for the lack of change in body mass. Gremeaux et al.⁽²²⁾ demonstrated that an exercise program combined with nine months of nutritional counseling significantly improved body mass, BMI, and waist circumference in obese adults. The findings of the present study are consistent with limited previous research that has shown similar improvements in total body fat percentage with 6 weeks of exercise programs⁽²³⁾, overweight women⁽²⁴⁾, obese women⁽¹⁷⁾. Although a reduction in total body fat percentage is able to reduce cardiovascular mortality, a greater focus should be on reducing abdominal adiposity in middle-aged adults⁽²⁵⁾. Thus, a key finding in the present study was the significant reduction in waist circumference in FIFA 11+ groups.

Limitations

A limitation of our study may be associated to the fact that the participants were not blinded to control/intervention which may lead to special motivational efforts or to create expectations generated by the admission to intervention group. Another limitation is the short study period may be a limiting factor of this study. In the next study, it will be necessary to examine the effects of FIFA 11+ in obese women by lengthening the study period. Finally, this study based on research exclusively on an Indonesian population, and further research is needed to extend it to other ethnic groups.

Conclusions

The main findings of this study suggest that just 6 weeks of implementation of the FIFA 11+ warm-up program improves body composition. Therefore, the FIFA 11+ program can be considered appropriate for this age, as it seems to be adequate for inducing significant performance enhancements in obese women. Moreover, given the improvements in body composition, our study would advocate the introduction of these essential movement competency skills in obese women aged 30-40 years.

Conflict of Interest

The authors declare no conflict of interest.

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Ethical Clearance: This study was approved by the ethics committee of Khon Kaen University (Decision number: HE622224).

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Association of Health Risk Behaviors with Cardiovascular Diseases: A Hospital-based Case Study in Noakhali district, Bangladesh

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Abstract

Cardiovascular diseases have become the most significant cause of global mortality and morbidity, particularly for low and middle-income countries such as Bangladesh. This condition is widely attributable to unhealthy outcomes in its association with risk factors such as age, obesity, smoking, low socioeconomic state, and sedentary lifestyle, which play a significant role in the progression of cardiovascular diseases. A prospective case study conducted in a few hospitals (both government and private) of Noakhali district, Bangladesh, and 50 subjects were included in the study. About 52% of patients had total cholesterol above normal level (>200 mg/dl), 64% of patients had triglycerides >150mg/dl, and hence HDL level also showed poor level for 80% of the patients (<40mg/dl). About 58% were smokers, and 68% consumed smokeless tobacco at a certain point and mostly relied on carbohydrate consumption in their diet. 42% of them are living a sedentary lifestyle, and male patients had significantly higher triglyceride levels than females ($P<0.035$). Moreover, with the increase of age, the level of physical activity decreased with time ($p<0.003$), and female patients were more lethargic than males in doing so ($p<0.033$). Obesity creped into patients if there were either widowed or separated from their partners ($p<0.009$) with reducing physical mobility ($p<0.007$). Smokeless tobacco uses found to be high in patients with low education levels ($p<0.005$). Our study showed that the common risk factors among our subjects without comorbidity were age, obesity and overweight, physical inactivity, low socioeconomic status, and smoking.

Keywords: Cardiovascular Diseases; Health Risk Behaviors; Obesity; Hypertension; Diabetes Mellitus; Socioeconomic Factors

Introduction

Cardiovascular Diseases (CVDs) are one of the most significant contributors to global mortality in developed countries, and its prevalence is mounting in developing countries as well and posing a major challenge for the health sector ⁽¹⁾. According to the Heart Disease and Stroke Statistics 2016 update by the American Heart

Association, heart disease, and stroke continue to be the top two killers worldwide. As of 2013, 31% of all deaths were from CVD, with 80% occurring in low and middle-income countries; stroke accounted for 11.8% of all deaths ⁽²⁾.

Cardiovascular diseases and diabetes mellitus share common risk factors, such as unhealthy lifestyle, including overweight and obesity, lack of physical activity, and an unbalanced dietary pattern ⁽³⁾. In addition, cardiovascular diseases are considered the most common cause of hospital admission worldwide, resulting in a tremendous economic burden on health care systems ⁽⁴⁾. Therefore, the prevention of these diseases and early detection of factors that may contribute to their occurrence is considered a public health necessity that should be taken into consideration ⁽⁵⁾. A World Health

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Organization expert panel identified dietary habits as a major modifiable determinant of chronic diseases, having a long-lasting effect capable of shaping the development of cardiovascular disease and diabetes later in life ⁽⁶⁾.

Lifestyle modification is one of the components of CVD management. Encouraging asymptomatic individuals to change their lifestyles to lessen future risks may be challenging. Therefore, it is crucial to determine what motivates patients to develop healthier lifestyles to reduce the risk of CVD. Decisions must be taken concerning which people should be the focus of direct risk mitigation efforts. Evidence shows that adequate knowledge about CVD risk factors is an essential precondition to behavioral changes, but knowledge solely often is inadequate for eliciting preventive actions ^(7, 8). The likelihood of espousing healthy behaviors may be higher if people perceive themselves at increased risk for CVD ⁽⁹⁾. Diet modification that emphasizes on adequate intake of fruits and vegetables, whole grains, low dietary fats, low intake of dietary sodium and salt reduction has shown a positive impact in the reduction of blood pressure in normotensive and hypertensive patients ⁽¹⁰⁾.

Rapid urbanization, westernized diet, increased consumption of tobacco, and limited physical activity in the developing world are also associated with the higher incidences of CVD ⁽¹¹⁾. According to the INTERHEART study ⁽¹²⁾, Bangladesh has the highest prevalence of CVD risk factors among South Asian countries. In Bangladesh, 99.6% of males and 97.9% of females are exposed to at least one established CVD risk factors ⁽¹³⁾. Nevertheless, the level of awareness among the people about CVD risk factors is shallow in Bangladesh. Concomitantly, the detection and control rates were also poor, possibly as a result of poor literacy rate, low access to healthcare facilities, or divergent priorities ⁽¹⁴⁾.

The study aimed to find out the extent of health behaviors and risk factors for CVD among adults in Noakhali district, Bangladesh. The findings of this study

will be a step forward in this mostly unexplored area and provide information for future studies.

Methodology

Study design: It was a case study conducted among patients suffering from a different kind of cardiovascular disease attending hospitals (both government and private) for treatments in the Noakhali district, Bangladesh. A total of 50 patients participated in this study, who voluntarily agreed to share their information.

Data collection procedure: A pre-designed, pre-tested, and structured questionnaire were used to collect data, including information of interest. Different variables were considered as education, socioeconomic status, tobacco smoking, diet, physical activity, BMI, diabetes, hypertension, etc. For obtaining biochemical measurements, the patient's medical history file was analyzed after taking proper permission of the study objectives.

Data analysis: Obtained data were analyzed statistically by using SPSS software version 23. Descriptive statistics, chi-square test, and Student's t-test were conducted to find out the study objectives.

Results

Sociodemographic pattern

Of the 50 participants, 35 (70%) were males, and 15 (30%) were females. The majority of the participants (72%) were from the rural area and were married (82%) (Table 1). More than half had never attended school, and 10% were housewives (Table 1).

Smoking

Out of the total, 29 (58%) participants were smoking previously. 14 (28%) participants were currently smoking. Thirty-four (68%) respondents were using smokeless tobacco products. Gender, marital status, and occupation were significantly associated with smoking.

Table 1: Distribution of sociodemographic characteristics by gender:

Age of the Respondent	Gender		Total	P-Value
	Male	Female		
<40 Years	4 (80%)	1 (20%)	5 (10%)	0.869
40-49 Years	12 (75%)	4 (25%)	16 (32%)	
50-59 Years	8 (66.7%)	4 (33.3%)	12 (32%)	
=>60 Years	11 (64.7%)	6 (35.3%)	17 (34%)	
Marital status				0.000
Married	34 (82.9%)	7 (17.1%)	41 (82%)	
Separated and Widow	1 (11.1%)	8 (88.9%)	9 (18%)	
Education of the Respondent				0.733
No Formal Education	19 (65.5%)	10 (34.5%)	29 (58%)	
Primary	9 (75%)	3 (25)	12 (24%)	
Secondary	5 (71.4%)	2 (28.6%)	7 (14%)	
Higher Secondary	2 (100%)	0 (0%)	2 (4%)	
Occupation of the Respondent				0.000
Day laborer	20 (100%)	0 (0%)	20 (40%)	
Business	4 (100%)	0 (0%)	4 (8%)	
Unemployed	8 (44.4%)	10 (55.6%)	18 (36%)	
Retired	3 (100%)	0 (0%)	3 (6%)	
Housewife	0 (0%)	5 (100%)	5 (10%)	

Fruit and vegetable consumption

Only 2% of the participants consumed sufficient fruit, and 96% of the participants consumed sufficient vegetables. Seasonal vegetables, cauliflowers, and guava were the most common. Nearly all households (100%) used vegetable oil (mustard, soybean, sunflower oil) for cooking. Half of (26 out of 50) participants were using extra salt to a meal at the table.

Physical activity pattern

Almost 90% of unemployed participants were physically inactive. Age, marital status, and occupation were significantly associated with physical inactivity.

Table 2: Descriptive statistics and metabolic CVD risk factors

Variable Name	Frequency (valid percentage)	Variable Name	Frequency (valid percentage)
Gender		Hypertension	
Male	35 (70%)	Yes	29 (58%)
Female	15 (30%)	No	21 (42%)
Age		Diabetes	
<40 Years	5 (10%)	Yes	24 (48%)
40-49	16 (32%)	No	26 (52%)
50-59	12 (24%)		
=>60	17 (34%)		
Education		Family history of cardiovascular disease	
No Formal Education	29 (58%)	Yes	19 (38%)
Primary	12 (24%)	No	31 (62%)
Secondary	7 (14%)		
Higher Secondary	2 (4%)		
Occupation		Total cholesterol (mg/dl)	
Day Laborer	20 (40%)	Normal (<200 mg/dl)	24 (48%)
Business	4 (8%)	Borderline (200-239 mg/dl)	11 (22%)
Unemployed	18 (36%)	High (>240 mg/dl)	15 (30%)
Retired	3 (6%)		
Housewife	5 (10%)		
Monthly income		Triglycerides(mg/dl)	
<20000	19 (38%)	Normal (<150 mg/dl)	17 (34%)
20000-30000	26 (52%)	Borderline (150-199 mg/dl)	12 (24%)
>30000	5 (10%)	High (200-499 mg/dl)	21 (42%)
Body Mass Index (kg/m2)		HDL (mg/dl)	
Below Normal (<18.5)	4 (8%)	Poor (<40 mg/dl)	40 (80%)
Normal (18.5-24.9)	20 (40%)	Better (40-59 mg/dl)	10 (20%)
Overweight (25-29.9)	20 (40%)		
Obese (>30)	6 (12%)		

Obesity

The mean body mass index of total participants was 24.62. Obesity was observed in 12% of the participants (Table 2).

Hypertension

The prevalence of hypertension was 58%. Hypertension is relatively high in male, separated/ widow, unemployed participants.

Diabetes Mellitus

24 (48%) of the 50 participants had diabetes. (Table 2) The frequency of diabetes was higher in the participants with >60 years old. Male had a higher diabetes frequency than females.

Lipid Profile

Triglyceride (TG) level was above the normal limit (150 mg/dl) in 34% (17 of 50) of the participants. The average triglyceride level was 212.98 mg/dl. Substantially high TG level was at the age of less than

40, males, and unemployed persons. Compared to TG, the number of participants with a high cholesterol level (>240 mg/dl) was (30%) (Table 2)

Table 3: Distribution of anthropometric, clinical, and biochemical characteristics:

	Gender		P-Value
	Male Mean (SD)	Female Mean (SD)	
BMI (kg/m ²)	24.397 (3.6610)	25.147 (4.5755)	.206
HDL (mg/dl)	36.2854 (6.34837)	33.6607 (4.33147)	.396
Total cholesterol (mg/dl)	213.8857 (47.96899)	209.2867 (44.02167)	.363
Triglycerides (mg/dl)	226.0129 (122.36125)	180.4043 (53.04495)	.035

Note BMI, Body Mass Index; TG, Triglycerides; HDL, High-Density Lipoprotein.

*P-value derived from Student's t-test.

Discussion

This study found a high prevalence of CVD risk factors among the study population. They were disproportionately distributed by age, gender, marital status, education level, and occupation. This was the hospital-based case study conducted to estimate the association of risk factors and health behaviors with cardiovascular disease in the Noakhali district, Bangladesh.

The percentage of participants who smoke earlier was 58%, which is high. 30% of participants quit smoking after they had cardiovascular disease. Notably, male and 40–50 years aged participants had more tendencies to be a smoker. Similarly, the presence of smoking habits in a large proportion of participants without formal education suggested an association between smoking and educational level. Several studies evaluated the relationship between low literacy and smoking and found that people with low reading ability were more likely to be smokers⁽¹⁵⁾. The presence of a large proportion of participants who quitted smoking (30%) in the study could suggest the increasing trend

of cessation of smoking. That might be because of increasing literacy rate and implementation of tobacco-free initiatives thorough out the nation. The frequency of smokeless tobacco consumption is higher among the participants (68%). Older females had more tendencies to consume smokeless tobacco.

This study found that inadequate fruit consumption among the participants but the vegetable consumption was sufficient among almost every participant. Both the findings from the current study and national survey are substantially higher than that of low- and middle-income countries⁽¹⁶⁾. Seasonal production, insufficient supply, and the comparatively high price of fruit adversely affected on their intake. This can also be explained as insufficient knowledge about the benefits of fruit and vegetable intake.

Our study found that only 24% of people do high physical activity. Among 42%, people had a tendency to do light physical activity. Unemployed and females do less physical activity.

Lower levels of high-density lipoprotein (HDL) cholesterol and high levels of low-density lipoprotein (LDL) cholesterol cause an increased trend in CHD risk. (17) In our study, we found 80% of people who had poor HDL. The high levels of triglycerides also increase CVD risk (18). 42% of participants, we found who had a high triglyceride level. According to the INTERHEART study, the abnormal blood lipids levels are causing myocardial infarction (MI) globally and become the most critical risk factor that can cause MI (19). Another biological factor includes the high blood pressure also had present among 58% of participants. In our study, we found that the frequency of extra salt intake is 52%. Excessive sodium intake in-creases CVD risk significantly, while through reduced sodium intake, a significant decrease in CVD burden is re-ported. High sodium intake increases our blood pressure that is confirmed through various epidemiological, animal, studies, and genetic studies. In addition to that, reductions in sodium intake lead to declines in systolic and diastolic blood pressure that reduces heart attacks and strokes (20).

Conclusion

Besides the well-known risk factors, genetic factors, and some emerging risk factors unique to this population may play an important role in CVD. Mainly due to the unhealthy diet, smoking decreased physical activity, and many more factors, especially in developing countries. People should take some sessions on physical activity and nutrition, including awareness development about risks of overweight or obesity and calorie-dense fast food. Preventive measures, both primary and secondary, are needed to control and better manage heart diseases both in early childhood to middle age populations. Furthermore, people should be encouraged to maintain a high level of physical activity in their daily life.

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The Establishment of Shelter Care Services: An Overview of Shelter Care in Malaysia

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Abstract

All of the Shelter Care institution had strict rules and regulations, especially about the status of registration. Unregistered Shelter Care with government or private sector will bring problems to the institution especially on financial contributions and safety regulation. **Objectives:** In view of this fact, study of Shelter Care services has been conducted to identify the most dominant factors that applied by institution. **Methods:** This study involved 39 institutions and the parameters of study are a registration, entry status, care services, nutrition and accommodation. **Results:** The findings indicated that the Shelter Care involved was fulfilling the standard of Multiple Indicator Cluster Survey (MICS) and Demographic and Health Surveys (DHS). The data was analysed by factor analysis using XL STAT software. Exploratory factor analysis (EFA) and Confirmatory factor analysis (CFA) were computed to identify the most dominant factors whereas reducing the initial five parameters with recommended >0.70 of factor loading. **Conclusion:** From this study, the result show that all institution is according to the set of procedures that needed.

Key words: Shelter Care, institution, children, entry status, care services, accommodation.

Introduction

Child well-being means that a child's basic needs are met and the child has the opportunity to grow and develop in an environment that provides consistent nurture, support, and stimulation. During the Industrial Revolution, people saw children as durable, inexpensive and powerless labour sources and it was not until the 19th Century that the state began assuming responsibility for children through the formation reform schools and orphanages¹.

Shelter Care has profound negative effects on young children across multiple domains of functioning. A lot of the children living in Shelter Care are not orphaned, but rather have one or both parents living. In a number of countries, 80–90% of institutionalized children have at least one living parent². The diversity

of protection institutions leads to a variety of different systems or care. So that, Shelter Care agencies can't guarantee high achievement rates with current treatment populates. Through trial test of intercession viability are troublesome, given numerous limitations on assessments. Institution that give a specified treatment for children are difficult to follow the set procedures such as registration status, entry status, care services, nutrition and accommodation. Therefore, this study aims to identify the most dominant factor that the manager in the Shelter Care is concerned.

Material and Methods

The procedures of the questionnaire related to our study that was undertaken by the following procedure:

Respondent: A random sampling approaches were applied to this study encompasses of all managers in Shelter Care at Terengganu Malaysia. Overall, there are 72 shelter care at Terengganu Malaysia were randomly selected 39 to participate in this study. All the process of the research including procedure and protocol were

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approved.

Instrumentation: Questionnaire using Multiple Indicator Cluster Survey (MICS) and Demographic and Health Surveys (DHS). The questionnaire was modified to facilitated manager of the Shelter Care institution understanding of the questionnaire as well as appropriate research. The questionnaire was translated into Malay Language using the back-translation method.

Data Analysis: The data was analysed using XL STAT by observations of 39 institutions and 5 parameters was calculated to be analysed. In this case, box plots and Kaiser-Meyer-Olkin were used to check the normality of data, error, typing error and we have small missing data < 3 %. Based on this result, it's described all the data do not have any missing although all of variables are normal.

Factor analysis (FA) method was used to analyse the raw data. Through the analysis, it helps the researcher to determine the main factors related to the student and staff in institution. Factor analysis have been used to reduce a large variable into a fewer variable³. From this study, 5 factors were categorized as an independent variable. However, the dominant factors extracted by applying principal components analysis method will only be interpreted when applying varimax rotation.

FA is applied to infer relationships between variables. Varimax method is used in the FA techniques. The varimax rotation ensures that every variable associated with only one principal component analysis (PCA) as encompassing a near-zero relationship with the other components. Eigenvalues obtained from varimax rotation are the precursor of the FA. Eigenvalues over 1 were considered as significant and subsequently varimax factors (VFs), which are the new groups of variables are produced.

The VFs values which are greater than 0.7 (> 0.70) are considered as "strong", the values ranging from 0.50–0.70 ($0.50 \geq \text{factor loadings} \geq 0.70$) are considered as "moderate", and the values ranging from 0.30–0.49 ($0.30 \geq \text{factor loadings} \geq 0.49$) are considered as "weak" factor loadings. The fundamental model of FA is stated as equation 1:

$$Z_{ij} = af_1 f_{1i} + af_2 f_{2i} + \dots + af_m f_{mi} + e_{fi}$$

where, z is the measured value of a variable, a is the factor loading, f is the factor score, e is the residual term accounting for errors or other sources of variation, i is the sample number, j is the variable number, and m is the total number of factors.

Result and Discussion

The Importance of Registration: Factors pattern after varimax rotation for registration was disclosed in Table 1 and Table 2. There are 36 components that can be seen from first factor (D1) that are fulfilled the 0.70 factor loading threshold 20-25 years old, certificate/ Diploma, 1-3 years' experience, learning, government, private, not-working and >RM 500-RM 1001. Second, dominants factor (D2) identifies 7 components with a positive higher factor loading such as married, supervisor, Quran and academic teacher, 11 years and above, 13-18 (Male) and 13-18 (Female). Third, dominant factor (D3) are 7 components such as 26-30, 31-35, 41 and above years old, widow or widower, 4-6, 7-10 years' experience and RM 1501 and above. Fourth, there are 4 components of factors (D4) that are part time, no defects, death of mother or father and orphan. Fifth, the dominants factor (D5) identifies two components which is PMR/SPM and no salary/allowance. Sixth, the dominants factors (D6) are male and female. Seventh, the dominant factor (D7) is only training courses. Eighth, the dominants factor (D8) are physical and other defects. Ninth, the dominant factors (D9) is hearing. Tenth, the dominant factor (D10) is driver and (D11) is RM 500-RM 1000. Twelve, there is a dominant factor (D12) such as < 5 year students stay in institution. Then, (D13) there is no dominant factor and (D14) have only one which is speech. So that, the entire dominant factor above is the factor which is emphasized by the institution.

One of the dominant factors in registration which is selected are about Quran and academic teacher in Shelter Care. Based on the view, the Qur'an School Curriculum has prevailed operationally as a necessary socialization instrument and an index of quality education amongst Muslim communities in this country⁴. This development largely explains why Quran Schools constitute conspicuous features in every Muslim settlement; they persist as cultural and religious institutions in

the lives of Muslims. Quran literacy and training in Islamic etiquettes are necessary for the development of an Islamic personality and continuity of Islamic traditions⁵. Quran Schools are usually established by individuals, religious organizations and communities who are of the Islamic faith, these institutions enjoy widespread support amongst Muslims generally. Based on the foregoing reflections⁶, expatiates further that as the Quran Schools in Nigeria serve millions of children either as a sole source of education or as a supplementary

form of education, in addition to public schooling; they are significant educational institutions in the country.

Table 1 shows a significant factor in the reliability and validity of Cronbach's alpha in registration which is D1 (0.96%), D2 (0.94%), D3 (0.94%), D4 (0.77%), D6 (0.71%), D7 (0.59%), D8 (0.82%), D9 (0.51%), D10 (0.63%), D11 (0.00%), D12 (0.70%), D13 (-0.43%) and D14 (0.63%). The Cronbach's alpha which is value >0.70 is greater factor in status registration.

Table 1: Factor pattern after Varimax rotation (Registration) for D1 until D14

	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14
Eigenvalue	11.07	7.64	7.09	4.88	3.04	2.74	2.41	2.24	2.13	2.00	1.78	1.37	1.28	1.12
Variability (%)	17.04	11.76	10.91	7.50	4.68	4.21	3.71	3.44	3.27	3.08	2.74	2.11	1.97	1.73
Cumulative %	17.04	28.80	39.71	47.21	51.89	56.11	59.82	63.26	66.53	69.61	72.34	74.46	76.42	78.15
Cronbach's Alpha	0.96	0.94	0.94	0.97	0.77	0.71	0.59	0.82	0.51	0.63	0.00	0.70	-0.43	0.63

The Requirement of Entry Status: Mostly, the student in institution losing their mother or father and majority stay in an institution. The study found that most of the children living in institutions are orphans. However, the institutions accept any status of their students. Therefore, all the institution should know the student's profile as the foundation to describe about their behaviour⁷. Children who exhibit in preschool are seen as more sociable in kindergarten, whereas children who exhibit aggressive behaviours are more likely to be rejected by peers and viewed as hostile and aggressive by teachers⁸. Additionally, children with better emotional regulation tend to have positive relationships with teachers⁹.

(0.53%). The Cronbach's alpha which is value >0.70 is greater factor in entry status.

Table 1 shows a significant factor in the reliability and validity of Cronbach's alpha in entry status which is D1 (0.96%), D2 (0.64%), D3 (0.01%), D4 (0.64) and D5

The Management of Care Services: The dominant factor for care services is more to the education and facilities. In this study, the area refers to a Shelter Care specifically for children. ¹⁰defines facility management as a profession which includes various disciplines ensure that built-in functions are built by integrating people, places, processes and technology. According to the¹¹, the management of facilities is classified as a collection of activities within develop a variety of disciplines and manage the impacted environment to people and places of work. It disclosed the most significant component of factor loading after varimax and it can be seen the contribution of the variance for D1 (24.12%), D2 (12.48%), D3 (7.07%), D4 (5.51%), D5 (4.84%), D6 (4.18%), D7 (3.91%) and D8 (3.53%) as showed in Table 2 below.

Table 2: Factor pattern after Varimax rotation (Care services)

	D1	D2	D3	D4	D5	D6	D7	D8
Eigenvalue	7.48	3.87	2.19	1.71	1.50	1.30	1.21	1.09
Variability (%)	24.12	12.48	7.07	5.51	4.84	4.18	3.91	3.53
Cumulative %	24.12	36.61	43.68	49.18	54.02	58.20	62.11	65.64
Cronbach's Alpha	-0.33	0.81	0.90	0.69	0.77	0.81	0.84	0.83

The Quality of Nutrient: Factors pattern after varimax rotation for nutrition was disclosed in Table 3 below. There is only one dominant factor (D1) which is quality and quantity. The dominant factor in nutrition is quality and quantity. The cumulative value for quantity and quality is 20.26% variance. Nutrition is very important especially to children. This is because balanced diet and nutrition need to be emphasized at least three times a day. According to¹², based on National Centre for Health Statistic (NCHS) / WHO growth reference, linking physical growth to motor development emphasizes the importance of seeing children’s development comprehensively. Three new elements that are prescriptive approaches that move beyond the growth of standards, the inclusion of children from around the world, the relationship between physical growth, motor development and provide solid instruments to help meet the health of children in the world.

Despite, if the Shelter Care has a problem with the financial, but its need to be fulfilled. This is in line with Abraham Maslow’s first derivation¹³ in the Maslow’s needs hierarchy where food is a basic necessity and biological necessity for every human being. It disclosed the most significant component of factor loading after varimax and it can be seen the contribution of the variance for D1 (20.26%). While the reliability and validity of Cronbach’s alpha for D1 is 0.63 %.

Table 3: Factor pattern after Varimax rotation (Nutrition)

	D1
Eigenvalue	1.82
Variability (%)	20.26
Cumulative %	20.26
Cronbach’s Alpha	0.63

The Accommodation and Safety: Factors pattern after varimax rotation for accommodation was disclosed in Table 4. There are two dominant factor (D1) are institutional check-up and preventive measures. Next, there are two components factor (D2) such as show off out signboard and improving fireman tool.

Safety is a requirement for every individual to survive.¹⁴also suggests there are nine basic human needs such as security, adventure, freedom, exchange, power, expansion, acceptance, community and expression. According to the accommodation and safeness part in Shelter Care, the dominant factor is more for preventing measures in the event of the fire. With regard to fire, important things to emphasize are the design of a building such as periodic checking, smoke detection, gathering, emergency lights and alternative routes when there is a fire¹⁵.

According to¹⁶, the Maslow’s hierarchy could be used to describe the type of information that individuals need at different levels as individuals such as to find information about a personal safety. However, based on the findings, Shelter Care does not do the fire training accordingly to the frequency set that may be due to lack of financial resources or less exposed to the matter.

However, if there is a noble effort such as volunteering in helping to improve security at the institution, then fire training may be held at the Shelter Care at least twice a year. This is in line with security requirements in Maslow’s Hierarchy of Needs (1904-1970) which is protection from harm and living in a safe area.

It disclosed the most significant component of factor loading after varimax and it can be seen the contribution of the variance for D1 (39.34%) and D2 (14.63%). While the reliability and validity of Cronbach’s alpha for D1 (0.84%) and D2 (0.77%).

Table 4: Factor pattern after Varimax rotation (Accommodation)

	D1	D2
Eigenvalue	4.33	1.61
Variability (%)	39.34	14.63
Cumulative %	39.34	53.97
Cronbach’s Alpha	0.84	0.77

Conclusion

As a conclusion, the findings show that have five parameters that followed by Shelter Care such

as registration, entry status, care services, nutrition, and accommodation and safety in Kuala Terengganu, Malaysia. The current study is seen to be very relevant today as it allows every Shelter Care institution to know about the weaknesses of each institution from the five emphasized aspects. Furthermore, it can help the parents to choose and learn about the procedures of admission and facilities provided in a Shelter Care institution before sending their children. However, the institution still needs to look at other matters that are also important in managing a Shelter Care.

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Effectiveness of Multimodal Intervention Package to Assess the Nutritional Status & Psycho-Social Wellbeing among Children with Thalassemia Attending Thalassemia Unit of HSK Hospital & Research Center Bagalkot, Karnataka

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Abstract

Background of the study: Every year approximately 100,000 children with Thalassemia Major are born world over, of which 10,000 are born in India. It is estimated that there are about 65,000-67,000 β -thalassemia patients in our country with around 9,000-10,000 cases being added every year

Once a child is diagnosed to have thalassemia homozygous disorders, he/she has to take lifelong treatment. Management includes regular 3 weekly filtered packed red cell transfusions, chelation therapy for iron overload.

Objectives of the study: • To find out the effectiveness of multi-model interventional package on nutritional status & psycho-social well being of children

- To find out the association between nutritional status & psycho-social well being with selected socio-demographic variables
- To identify the correlation between nutritional status & psycho-social well being of children

Materials & Methods: An experimental research approach was used for the study with pre experimental one group pre test -post test without control group design. Study was conducted at thalassemia unit of Hanagal Shri Kumareshwar Hospital and research center Bagalkot, Karnataka. Using digital weighing machine weight of children has been collected followed by this Likert;s scale is used to assess the Psycho-social wellbeing of 100 children who were selected by purposive sampling technique. The effectiveness was determined by paired t test and the association was explored by chi-square test, correlation is determined by Karl Pearsons Correlation coefficient.

Results: A sample of 100 children were taken in the study, amongst 60% of children were in the age group of 7-9 years. 32% children were severely malnourished. 90% children had fair quality of life. The calculated t value is 6.84 at 5% level of significance and the p value is less than 0.00001 which determines there is a significant difference between the pre-test nutritional scores and Post-test nutritional scores of children. The value of R is 0.0917, indicating the relationship existing between two variables is weak.

Conclusion: results revealed that more than 90% of children were having fair quality of life and 32% of children are in severe malnutrition category. Hence it is concluded that thalassemia severely affects the nutritional status and quality of life of children. In the present study multimodal interventional package has played a significant role in improving the quality of life and nutritional status of children. Study recommends for future researchers to conduct studies to improve other aspects of quality of life of thalassemic children.

Key words: Malnutrition, Psycho-social wellbeing, quality of life, multi-model interventional package, thalassemia.

Introduction

Thalassemia is a blood disorder caused by weakening and destruction of blood cells. It inhibits production of hemoglobin and RBCs. Children with thalassemia require regular blood transfusions and bone marrow transplantations. Over 10,000 children in the country are born with thalassemia every year.¹

Thalassemia syndromes are a heterogeneous group of single gene disorders, inherited in an autosomal recessive manner, prevalent in certain parts of the world.² Worldwide 15 million people have clinically apparent thalassaemic disorders. It is estimated that there are about 65,000-67,000 β -thalassaemia patients in our country with around 9,000-10,000 cases being added every year (1-7). The carrier rate for β -thalassaemia gene varies from 1 to 3% in Southern India to 3% to 15% in Northern India. They are encountered among all ethnic groups and in almost every country around the world.³

Nutritional deficiencies are common in thalassemia, due to hemolytic anemia, increased nutritional requirements, and morbidities such as iron overload, diabetes, and chelator use.⁴

Thalassemia has severe complications such as heart failure, cardiac arrhythmia, liver disease, endocrine complications, and infections are common among thalassemia patients. Despite the critical advances in the knowledge of the psychological assessment in chronic patients, very few studies are carried out to investigate correlation between psychological conditions and quality of life in Thalassemia major (TM) patients. As the mean age and life expectancy of TM patients expands, psychosocial issues related to quality of life become an increasingly important focus of attention. It is universally known that chronic diseases have a psychological implication, which in pediatric age has a great importance. Children with chronic physical illnesses exemplified by thalassemia are vulnerable to emotional and behavioral problems.⁵

Various authors have reported that up to 80% of children with thalassemia are likely to have psychological problems like oppositional defiant disorder, anxiety disorder and depression.⁶ Although children with all types of blood disorders are exposed to similar stressors, those with thalassemia are unique in that they have to

attend hospital regularly for blood transfusions.⁶

Material and Methods

Study Design and Participants

An experimental research approach with pre experimental one group pretest post-test design without control group was used in the present study. Study conducted for the period of 6 months from Oct 2019 to March 2020 in HSK Hospital and Research center Bagalkot Karnataka. The sample for the present study was 100 children in the age group 3-12 years with thalassemia selected by purposive sampling technique. Digital weighing machine for weight measurement & structured Likert's scale to assess the quality of life of children were used. Observation and structured interview schedule were data collection techniques. Intervention was given in the form of Nutritional training intervention; peer group interaction & parental support group & post test was conducted by using the same scales to assess the effectiveness of intervention.

Criteria for Sample selection:

Inclusion Criteria:

The study includes children who were

- Attending thalassemia unit of HSK hospital & Research center Bagalkot Karnataka
- Able to understand Kannada.
- Available at the time of data collection
- Willing to participate in the study

Exclusion criteria

The study excludes children who were

- Not able to co-operate during the study.
- Sick and not able to provide data.

Sample size

A total of 100 children suffering from thalassemia attending thalassemia unit of HSK Hospital & research center Bagalkot were taken.

Instruments

For Weight Measurement: A digital weighing machine has been used to record weight of children. Used WHO Anthro Plus software for assessment of nutritional status of children.

For Quality of life: Structured Likert's scale was administered to assess the quality of life of children.

Description of Instrument

The instrument was divided into two parts

Part – I: It consists of 8 items regarding the demographic information of the children such as Age, Gender, Educational status, Type of family, Religion, Family monthly income, area of residence,

Part – II: It consists of 20 items with 5 points ranging from never to almost always to assess the quality of life of children. The tool consists of 4 domains like Physical functioning, emotional functioning, and school functioning & social functioning and in all the domains 5 items were included.

Scoring:

Weight: Scoring system for weight of children is Less than -2 Normal. -2 to -8 Moderate malnutrition. More than -3 severe malnutrition.

Quality of life: Grades of quality of life on a scale are excellent, good, fair & poor.

Data Collection Procedures

Prior permission was taken from Hospital authority to conduct the study, Pre-test nutritional status was assessed by digital weighing machine, and quality of life was assessed by taking mothers report on a Likert's scale.

Administration of (multi-model interventional package) intervention as follows

- Nutritional Training Intervention on 10/11/2019 for 2 Hrs.
- Peer Group Interaction on 11/11/2019 from morning 10am to 3pm
- Parent Support Group on 12/11/2019 form

morning 11 am to 4.30 pm.

- After 3 months on 2/2/2020 we have conducted post-test for the same 100 children by using same instruments.

- The investigator has started data collection at 10 am and the whole process has been completed by 5.30 pm.

Data Analysis

Descriptive Statistics

- Frequency and Percentage distribution was used for analysis of demographic variables of children
- Frequency, Percentage distribution, mean and standard deviation for analysis of nutritional status and psycho-social well being (quality of life).

Inferential Statistics

- Paired “t” test was used to compare pre-test and post-test scores for nutritional status & psycho-social well being (quality of life)
- The chi squared (X^2) test was used to find out the association between the nutritional status & psycho-social well being with selected socio-demographic variables
- Karl Pearson's correlation coefficient was used to find out the correlation between nutritional status & psycho-social well being (quality of life).

Results

A: Sample characteristics

A Percentage wise distribution of children according to their age groups reveals that 60% belong to the age group of 7-9 years, followed by 36 % in the age group of 3-6 years, 4% in the age group of 10-12 years. Majority (52%) were female children. Similarly 52% children belong to 1st STD to 3rd STD. A majority 61 % of children were from nuclear family. Majority 92% of children were from Hindu religion. Family monthly income reveals that out of 100 children, 54% of children belongs to Rs.5000- Rs10000/-majority children were (62%) from rural area.

B: Effectiveness of Multi-Model Interventional Package on Nutritional status of children.

Table 1: Mean, SD and mean percentage of nutritional status scores in Pretest and Post-test.

Nutritional status	Pre-test (O ₁)		Post-test (O ₂)		Effectiveness (O ₂ -O ₁)	
	Mean ± SD	Mean %	Mean ± SD	Mean %	Mean ± SD	Mean %
Nutritional status	-2.2108±1.70	4.42%	-1.629 ±1.53	3.25%	-0.589±0.17	1.178

C: Effectiveness of Multi-Model Interventional Package on quality of life of children.

Table 2: Mean, SD and mean percentage of nutritional status scores in Pretest and Post-test.

Quality of Life	Pre-test (O ₁)		Post-test (O ₂)		Effectiveness (O ₂ -O ₁)	
	Mean ± SD	Mean %	Mean ± SD	Mean %	Mean ± SD	Mean %
Quality of Life	52.44±5.35	104.88	30.66±3.43	61.32	-21.78±-1.92	-43.56

Table 1 & 2 presents the mean and standard deviation related to the effectiveness of multi-model interventional package on nutritional status & quality of life among children.

D: To evaluate the effectiveness of Multi Model Interventional Package the following research hypotheses were formulated

Paired ‘t’ test was used to find out the significance of the differences between the pre-test nutritional scores and Post-test nutritional scores of children

Table 3: Significant difference between the pre-test and Post-test scores of nutritional status

Test	Mean	Std. Error	Mean Diff	SD. Diff	Paired t-Value	Table Value
Pre-Test (O ₁)	-2.21	0.011	0.59	0.08	6.84	3.84
Post-Test (O ₂)	-1.62					

The value of t is 6.844863. The value of p is <0.00001 Hence the result is significant at p <0.05.

The calculated t value is 6.84 at 5% level of significance and the p value is less than 0.00001 which determines there is a significant difference between the pre-test nutritional scores and Post-test nutritional scores of children.

Paired 't' test was used to find out the significance of the differences between pre-test scores of quality of life and Post-test scores of quality of life of children.

Table 4: Significant difference between the Pre-test and Post-test scores of quality of life.

Test	Mean	Std. Error	Mean Diff	SD. Diff	Paired t-Value	Table Value
Pre-Test (O₁)	52.44	0.71	21.78	1.92	26.96	2.01
Post-Test (O₂)	30.66					

The calculated value of t is 26.96. The value of p is <0.00001 Hence the result is significant at p <0.05.

The calculated t value is 26.96 at 5% level of significance and the p value is less than 0.00001 which determines there is a significant difference between the pre-test scores of quality of life of children and Post-test scores of quality of life of children. After analysis of findings it reveals that the multi-model interventional package (Nutritional training intervention, peer group interaction & parents support group) is effective in improving the nutritional status & quality of life of children.

E: Association between variables

Part-1 Association between Nutritional status of children and selected Socio demographic variables.

Chi-square was calculated to find out the association between Post-test scores of nutritional status of children with thalassemia with their selected socio demographic variables by using 2x2 contingency table.

There is no significant association between Post-test scores of nutritional status and selected socio-demographic variables: age, gender, and educational status, type of family, religion, family monthly income, child living with and area of residence.

Part-2: Association between quality of life of

children and selected socio demographic variables.

Fisher's exact test was used to calculate the association between Post-test scores of quality of life of children with thalassemia with their selected socio demographic variables by using 2x2 contingency table.

There is no significant association between quality of life of children with the socio-demographic variables: age, gender, educational status, religion, family monthly income, and area of residence. There is a significant association between quality of life of children with the socio-demographic variables: type of family and child living with.

F: Correlation between Nutritional Status & Quality of Life of children

Pearson's Correlation Co-Efficient Formula

Correlation between nutritional status and quality of life of children is determined by Persons correlation coefficient formula. r value is obtained after putting the values of X (Post-test scores of nutritional status) and Y (Post-test scores of quality of life) into the formula. The value of **R is 0.0917**. The value of R is positive which shows that there is a positive correlation-ship exists between two variables & since the R value is near

to **Zero** that indicates the relationship existing between two variables (Nutritional status of children & quality of life of children) is weak. The p value of R is 0.5265 hence the relationship existing between two variables is not significant.

Discussion

The present study was conducted with the aim to assess the nutritional status and psycho-social wellbeing of Thalassaemic children. Study included a sample of 100 children selected using the purposive sampling technique.

Findings of the study showed that, Majority 92% of children were from Hindu religion.

Similar findings were observed by Ankush et al. in their study conducted to assess the quality of life in children with thalassemia majora following up at a tertiary care center in India. In their study, major sample were belonging to Hindu religion.

In the present study findings showed that there is no significant association between quality of life of children with the socio-demographic variable like age.

Findings of the present study were supported by the findings of the study conducted by Sh Ansari,¹ A Baghersalimi,² A Azarkeivan,³ M Najomi,⁴ and A Hassanzadeh Rad.⁵ to assess the quality of life in patients with thalassemia majora result suggested that age had no effect on the QOL (7,15,17 questions in WHOQOL-BREF).

Limitations

The present study has included 100 children because of unavailability of thalassemia children. The study was limited to children with thalassemia attending thalassemia unit of Hanagal Shri Kumareshwar Hospital & Research Center. The present study assessed only the quality of life of children; other aspects of psycho-social well being are not attended. Age of the children was limited to 3years to 12 years.

Recommendations

The similar study can be conducted on a large scale with the sample size more than 1000

The similar study can be conducted on other aspects of psycho-social wellbeing like autonomy, competence, self acceptance, self efficacy etc.

The true experimental study can be conducted with experimental and control group.

Conclusions

The present study concluded that 32% children were with severe malnutrition after introducing nutritional training intervention the extent of malnutrition has been reduced to 22%. Similarly in respect to quality of life 6% children were in poor category which has been reduced to 4% after implementation of parent support group and peer group interaction. Hence it is concluded that interventional programmes are effective in improving the health aspects of children with thalassemia.

Ethical Clearance

Ethical clearance was obtained from the institutional ethical committee of BVVS Sajjalashree Institute of Nursing Sciences, Bagalkot.

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Conflict of Interest: Nil

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Relationship between Mother Care Behavior and Quality of Life Stunting children in Kota Masohi District, Central Maluku Regency

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Background: Stunting is a health problem in children that can cause obstruction of various functional aspects of the child such as physical, motor and emotional social of children, this will have an impact on the quality of life children in the future. **Objective:** This study aimed to determine the relationship between maternal care behavior and the quality of life of stunting children aged 12-59 months in the Kota Masohi District, Central Maluku Regency. **Method:** The research design used was cross-sectional, with a total sample of 98 people carried out in the District of Masohi City, Central Maluku Regency, sampling using consecutive sampling techniques. Data on maternal care behavior and quality of life in children were obtained through questionnaires. The results of the study were analyzed using the chi square test and multivariate analysis with multiple logistic regression, with a significant level of $p < 0.05$. **Results:** More than half of maternal care behaviors and stunting under five are poor. Chi square test values indicate that there is a relationship between maternal care behavior with stunting toddler quality of life. The results also obtained that children aged 12-24 months are more at risk of experiencing poor quality of life compared to children aged 49-59 months. **Conclusion:** There is a positive relationship between maternal care behavior with stunting toddlers' quality of life in the Masohi District District of Central Maluku Regency, where children aged 12-24 months are most at risk of experiencing poor quality of life.

Keywords: Maternal care behavior, Quality of life, Stunting

Introduction

Quality life is a goal to be achieved at all age levels including children¹. Quality of life of children related to health is a subjective perception of the mother in assessing the functional status of children including seven domains of functions including physical (body), motor, autonomous, cognitive, social, positive mood and negative mood^{2,3}. Assessment of quality of life is very important to evaluate changes in children's health and determine care in children stunting¹.

Stunting is a condition of failure to thrive in children under five due to chronic malnutrition so that the child's body is too short for his age which affects the child's survival⁴.

Parents tend to assume that stunting is a natural thing so care is only given when the child is sick. This can affect the health conditions of children. Quality of life of stunting children depends on maternal care behaviors⁵ such as feeding, caring for children when sick, stimulating child development and interacting more often with children^{6,7,8}.

Stunting is a problem in Indonesia and is spread throughout Indonesia, including Central Maluku Regency, where in the last three years the prevalence of stunting under five has increased⁹. The purpose of this study was to determine the relationship between maternal care behaviors and quality of life of stunting children in the District of Masohi City, Central Maluku

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Material and Methods

This research was conducted in April to May 2019. The research design used was cross-sectional. The sample selection is done by consecutive sampling technique, with inclusion criteria; mothers and children stunted (12-59 months), residing in the District of Masohi City, Central Maluku Regency and willing to sign informed consent by mothers, be able to read and write. Exclusion criteria in this study are mothers and children who have disabilities and suffer from chronic diseases. During data collection mothers and children do not experience illness. To ensure that mothers and children do not experience pain (figure 1). Respondents approval was requested by signing an informed consent.

Figure 1. How to take samples

Instrument (1) Maternal care behavior questionnaire, was adopted from the Ulfi (2018)¹⁰. The value of validity obtained is 0.413-0.800 and cronbach's alpha 0.932. The questionnaire consists of 37 questions using a Likert scale; often (score 5), always (score 4), sometimes (score 3), rarely (score 2), and never (score 1).

(2) Questionnaire quality of life, was adopted from the Manongga (2011)², with a validity value of 0.413-0.839 and its reliability, the cronbach's alpha value is 0.844. Child's quality of life related to health is obtained from the mother's report through filling in the quality of life questionnaire, by looking at the functional status of the child in the last month which consists of various aspects; physical, motor, autonomic, social, cognitive, and emotional both negative and positive³. Each aspect consists of 8 questions using a Likert scale that is often (score 0), always (score 1), sometimes (score 2), rarely (score 3), and never (score 4)³.

The total values obtained for both maternal care behaviors and the quality of life of children are divided by median values into two categories; "good and not good"

(3) Tools for measuring the growth status of children using height measuring instruments namely microtoice and infantometer. Z-score values for calculating height or body length by age were calculated using WHO Anthro Software, and adapted to TB or PB standards based on

the decision of the Minister of Health of the Republic of Indonesia number 1995/Menkes/SK/XII/2010 regarding anthropometric standards with indicators of children were severely stunted (SD score <-3) and stunted (SD score -3 to <-2).

Statistics: The statistical test used is the chi-square test with the confidence level used is 95%. Next, the researcher conducted a multivariate multiple logistic regression test with a stepwise backward method to look at the variables that affect the quality of life of the child. The variables included in this test are those that have a significant value ($p < 0.25$) where the analysis is seen in the value of p and the strength of the relationship. The variable is said to affect the dependent variable if the value of $p < 0.05$ and see the Odds Ratio (OR) value¹¹.

FINDINGS

A total of 98 couples of mothers and stunting children were respondents in this study. In table 1, the data shows that most mothers of children under five are stunting in the age range of early adulthood (52%), most of the mothers work as housewives (85.7%), with the most education at secondary education level (46.9%), and 53.1% of family income above. Based on the characteristics of children, the highest age is 12-24 months (37.8%), where between men and women have comparable numbers (50%) and on the nutritional status of children (TB or PB/Age), most were in the short category (81.4%).

Table 2 shows that more than half of maternal care behaviors (55.1%) and the quality of life of stunted children (52%) are in a poor category. The results also showed that maternal care behavior was significantly influenced by mother's education and family income, while the quality of life of children was affected by the age of the child ($p < 0.05$).

In table 3, data are obtained that children aged 12-24 months compared with children aged 49-59 months and maternal care behavior are less good compared to good maternal care behavior, significantly both groups have an influence on the quality of life of children who are not good ($p < 0,05$). The OR value between children aged 12-24 months is greater than maternal care behavior which is equal to 6.031, meaning that stunting children with an age range of 12-24 months are more at risk 6.031 times

having a poor quality of life compared to stunting children with an age range of 49-59 months after being controlled by the mother's bad behavior.

Table 1. Characteristic of mothers and children

Characteristics	Frequency (f)	Persentasi (%)	Mean ± SD
Mother			
Age (year)			
Late youth (17-25)	21	21,4	31,45 ± 6,17
Early adult (26-35)	51	52	
Late adult (36-45)	26	26,5	
Occupation			
Housewife	84	85,7	
Civil servants	4	4,1	
Farmer	10	10,2	
Educational level			
Lower secondary	30	30	
Upper secondary	46	46,9	
Unirvesity	22	22,4	
Parental income			
Low	52	53,1	
Hight	46	46,9	
Child			
Age (months)			
12-24	37	37,8	31,57 ± 12,37
25-36	30	30,6	
37-48	16	16,3	
49-59	15	15,3	
Sex			
Man	49	50	
Women	49	50	
Nutritional status			
Stunted Severely	80	81,6	
Stunted	18	18,4	

Table 2. Maternal care behaviors and quality of life children

Characteristics	Maternal care behavior				P	Quality of life child				P
	Good		Not good			Good		Not good		
	n	%	n	%		n	%	n	%	
Maternal care behavior	44	44,9	54	55,1						

Cont... Table 2. Maternal care behaviors and quality of life children

Quality of life child						47	48	51	52	
Age child (months)										
12-24	13	35,1	24	64,9	0,331	12	32,4	25	67,6	0,032*
25-36	17	56,7	13	43,3		14	46,7	16	53,3	
37-48	8	50	8	50		10	62,5	6	37,5	
49-59	6	40	9	60		11	73,3	4	26,7	
Educational level mother's										
Lower secondary	8	26,7	22	73,3	0,043*	12	40	18	60	0,396
Upper secondary	23	50	23	50		22	47,8	24	52,2	
Unirvesity	13	59,1	9	40,9		13	59,1	9	40,9	
Occupation										
Housewife	42	50	42	50	0,013*	43	51,2	41	48,8	0,177
Civil servants & farmer	2	14,3	12	85,7		4	28,6	10	71,4	
Parental income										
Low	25	48,1	27	51,9	0,501	27	51,9	25	48,1	0,404
Hight	19	41,3	27	58,7		20	43,5	26	56,5	

*chi-square test; $p < 0,05$ **Table 3. The results of logistic regression test**

Variabel	P value	OR	CI (95%)
Maternal care behavior			
Good (reference)		1,00	
Not good	0,02*	2,837	1,179 - 6,824
Age child (months)			
12-24	0,01*	6,031	1,527 - 23,817
25-36	0,053	4,029	0,982 - 16,531
37-48	0,431	1,883	0,390 - 9,084
49-59 (reference)		1,00	
Occupation			
Housewife	0,107	0,230	0,038 – 1,375
Civil servants	0,192	0,163	0,011 – 2,483
Farmer (reference)	1,00	1,00	

* $p < 0,05$

Discussion

Maternal care behavior is part of parenting that is very necessary in stunting toddlers, especially in meeting the needs of children to prevent adverse effects that will occur and as a determinant of the quality of life of children in the future.

Needs that can be given to stunting children such as adequate and age-appropriate feeding of children, monitoring children's growth and development, providing psychosocial stimulation, seeking treatment, and access to health services as well as providing a safe and hygienic environment⁷.

In this study, maternal care for stunting infants was mostly obtained in the less category. Mother's care has a positive impact on children's quality of life¹². Maternal care behavior is part of parenting that is useful for improving the quality of life of children which can be seen through the development and growth of children.

The results of this study indicate that maternal care behavior is influenced by mother's education and work. Education is closely related to knowledge about how to care for children¹³. Lack of maternal care behavior associated with maternal education is due to lack of knowledge of mothers in child care such as nutrition, stimulation and utilization of health services¹⁴.

This condition is at risk for low motor, cognitive and socio-emotional development barriers in stunting children¹⁵.

Maternal care behavior is also influenced by the mother's occupation, where most mothers who behaved poorly were found in mothers who worked as civil servants and farmers. This is because the intensity and time of the mother are less shared with the child than the housewife. One of the care strategies in parenting recommended by WHO is to build interactions between mothers and children who are pleasant and provide stimulation and provide early learning that can be done through storytelling or playing with children. This interaction is more obtained if the mother has a longer time with the child and affects the relationship and closeness between mother and child¹⁶.

In this study, it was also found that the quality of life of children was not good, but the difference between the

quality of life of good and poor children was not much different. Quality of life of children is influenced by maternal parenting⁵. Lack of maternal care for stunting children will have an impact on children's survival. Some evidence has shown that stunting can result in children being susceptible to diseases¹⁷, changes in structure and brain development is slow so that it can affect; cognitive, emotional¹⁸, fine motor skills, and language³.

The functional barriers that occur in stunting children can be prevented through increasing maternal knowledge about care in stunting children by the way parents must increase nutrient intake, perform stimulation¹⁹, seek information, check and monitor child development by visiting health facilities, health workers and through social media. In addition, parents need to be made aware of the effects of stunting on children's development which can affect the quality of life for children²⁰.

The results also found that children aged 12-24 months were more at risk of experiencing poor quality of life of children. Salonga (2007) states that stunting children experience stunted structural growth and brain function. At this age the child is in very rapid brain growth²¹, especially the process of nerve cell myelination and synapse formation which increases gradually starting from the newborn and the fastest in the first 2 years. Both of these processes are useful for cognitive, language, motor, behavior and intelligence of children²². Walker et al. (2015) state that the impact of stunting that occurs at an early age is at risk for the next age²³. Therefore children with an age range of 12-24 months really need adequate care both nutrition and stimulation for functional functional maturity.

Conclusions

There is a relationship between maternal care behavior and the quality of life of stunting children in the area of Kota Masohi District, Central Maluku Regency.

Limitations of the study: In this study perceptual equations for measurement of TB or PB but not interrater reliability tests were carried out.

Conflict of Interest: None

Funding: The cost of this research is all borne by the researcher.

Ethical Clearence: Obtained from the ethics committee of the Faculty of Medicine, Public Health, and Nursing Gadjah Mada University with the number KE/FK/0421/EC/2019.

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How Do Breastfeeding Pillows Influence Mother Fatigue and Mother and Baby Response During Breastfeeding?

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Abstract

Background: Postpartum fatigue has a negative effect on the physical and mental conditions of a mother and mother and baby interactions. The process of breastfeeding is often the cause of postpartum fatigue. This study aimed to determine the effect of breastfeeding pillows on maternal fatigue and the mother and baby response during breastfeeding (MBA).

Methods: This research was a quasi-experimental study with nonequivalent (pretest and posttest) with a control group design. The research was conducted between July – February 2017 in the areas of Mantrijeron and Umbulharjo 1 Public Health Centers in Yogyakarta, Indonesia. Determination of samples was based on a screening process that was done purposively. The number of research samples were 60 respondents for the intervention and control group, ethical approval number was with Ref: KE/FK/0888/EC/2017.

Results: There were significant differences in MBA values ($p = 0.000$), and fatigue ($p = 0.002$) pretest and posttest in the intervention group compared to the control group. The mean difference between the pretest and posttest MBA scores in the intervention group was higher (1.93) than in the control group (0.53). The mean difference in the value of the pretest and posttest for fatigue in the intervention group was higher, which was equal to (5.16) than in the control group (1.93).

Conclusions: There is a positive influence the use of breastfeeding pillows on the value of maternal fatigue and the response of the mother and baby during breastfeeding.

Keywords: *breastfeeding, fatigue, mother and baby response during breastfeeding (MBA)*

Background

According to the 2012 IDHS data, the average Indonesian woman will have 2.6 children during her lifetime. The delivery period will be followed by the postpartum, breastfeeding and period of child care¹. A longitudinal study states that 62% of women experience fatigue and 18.3% experience severe fatigue on several postpartum days². Postpartum fatigue has a negative effect on the physical and mental condition of the mother, baby care activities, mother and baby interactions and response to breast feeding (MBA)³.

Women with caesarean section have a higher level of fatigue compared give birth normally women. The high rate of postpartum fatigue has a significant relationship with the difficulty of caring for the baby,

and results in maternal infant attachment weakness⁴. One of the factors that influence of postpartum fatigue is breastfeeding³. The 2012 IDHS data showed that only 27 percent of infants aged 4-5 months received exclusive breastfeeding⁵. Discontinuing the process of breastfeeding is caused by various factors such as pain in the breast and nipples; breast milk is not enough, shame give a breastfeeding in public places, and lack of health education about breastfeeding⁶.

Maternal and infant responses are objective evidence of the mother's and baby's comfort during breastfeeding. Lumbiganon⁷ concluded that one method supporting the breastfeeding process is not enough to increase the sustainability of exclusive breastfeeding. Breastfeeding pillows are designed to help nursing mothers in a sitting

position, mother's arms can support the baby better and make breastfeeding position more suitable for both the mother and baby. The pillows are safe and comfortable avoiding causing allergies and irritation to the mother's and baby's skin. Breastfeeding pillow is expected to be an alternative to reduce fatigue and increase closeness with the baby during breastfeeding.

This research was conducted in the area of Mantrijeron and Umbulharjo 1 Health Centers (*Puskesmas*), in Yogyakarta Indonesia. This study aimed to determine the effect of breastfeeding pillows on maternal fatigue and the response of mothers and infants during breastfeeding (MBA).

Research Methods

This research was a quasi-experimental study with nonequivalent (pretest and posttest) with control group design. The research was conducted between July – February 2017. The research was conducted in the areas of Mantrijeron and Umbulharjo 1 Public Health Centers in Yogyakarta, Indonesia. The study population was all postpartum mothers who gave birth at that place. The sampling technique was purposive sampling with inclusion criteria:

- a. Postpartum mother who gave birth with vaginal delivery (days 7 to 30 days);
- b. Infants aged 1 week to 30 days
- c. Healthy mothers and babies currently breastfeeding.

Exclusion criteria:

- a. Postpartum mother with complications such as postpartum blues, hemorrhage, and anemia.
- b. Babies who experience health problems as newborns, such as hyperbilirubinemia, palatoskisis, congenital heart disease, and other health problems.

Based on sample calculations with α 95% and β 90%, the minimum number of samples is 29.05 minimum of 30 samples per group.

The instrument used is a questionnaire which included:

- a. Fatigue symptom checklist

This instrument was developed by Corwin et al⁸. The Modified Fatigue Symptom Checklist (MFSC) consists of 30 statements that measure symptoms of physical and psychological fatigue. A concurrent validity instrument score was done by looking at the significance of the correlation, $r = 0.64$ and $p < 0.01$, compared to the VAS scale. Construct validity showed a significant correlation value ($p < 0.05$), compared to other instruments, Depressive Symptomatology Scale and the Spielberger State-Trait Anxiety Inventory. The internal consistency and reliability (Kuder-Richardson formula) of this instrument was 0.82-0.85 with Cronbach's alpha reliability of 0.81-0.91.

- b. MBA (Mother-Baby Assessment Scoring System Tool)

The Maternal-Baby Assessment (MBA) tool was used to assess the response of mothers and infants during breastfeeding. The MBA tool was developed by Mulford. In addition, this MBA instrument has also been used in Yulianti⁹. Before this observation checklist was used, observer agreement was conducted. The observers consisted of 5 people who observed the same 5 films about nursing mothers, followed by completing the observation checklist. An agreement was made with the analysis of Kruder Richardson with the result between the 5 observers having a high agreement. For the MBA instrument the Kappa test results = 0.692.

The intervention group was given a nursing pillow, and taught how to use it as well with correct breastfeeding methods and attachment techniques. Whereas, for the control group only the correct breastfeeding techniques and attachment techniques were taught. Measurement of pretest and posttest (one week after intervention) for the experimental group and the control group, observation of the mother and baby response, and assessment of the level of maternal fatigue. Data analysis was conducted with t tests and if the data was not normal then an alternative test was done.

Result

1. Characteristics of respondents

Table 1 show that all respondent characteristics homogeneous between the intervention group and control group, except the characteristic of experience in

getting health education about breastfeeding.

Table 1. Characteristics of respondents

Characteristics of respondents	intervention group (n = 30)		control group (n = 30)		p-value
	frequency	(%)	frequency	(%)	
Maternal age (mean)	29.5 years		30 years		0.640
Infant age (mean)	14.96 days		14.80 days		0.880
Maternal weight (mean)	63.58 Kg		61.86 Kg		0.569
Infant weight (mean)	3.32 Kg		3.15 Kg		0.078
Pregnancy experience					0.795
< 2 times	17	56.7	16	53.3	
≥ 2 times	13	43.3	14	46.7	
Maternal education					0.488
<Senior high school	4	13.3	6	20.0	
≥Senior high school	26	86.7	24	80.0	
Number of children born alive					0.592
< 2	20	66.7	18	60.0	
≥ 2	10	33.3	12	40.0	
Experience health education about breastfeeding					0.024
Never	5	16.7	13	43.3	
Ever	25	83.3	17	56.7	
Average number of hours sleep a day					0.448
< 6 hours	27	90.0	25	83.3	
≥ 6 hours	3	10.0	5	16.7	
Type of delivery					0.781
SC	9	30.0	10	33.3	
Normal	21	70.0	20	66.7	
Experience of breastfeeding					0.347
< 2 times	5	16.7	8	26.7	
≥ 2 times	25	83.3	22	73.3	
Mothers works					0.161
Yes	1	3.3	4	13.3	
No	29	96.7	26	86.7	

Cont... Table 1. Characteristics of respondents

Mother activities in housework					
Yes	24	80	25	83.3	0.739
No	6	20	5	16.7	
The presence of household assistant					
Yes	22	73.3	20	66.7	0.573
No	8	26.7	10	33.3	

2. Analysis MBA and Fatigue pre-test and post-test, in each group

Table 2 shows there are significant differences between the mean scores of the pretest and posttest MBA intervention groups ($p = 0.000$) and the control group ($p = 0.000$), but the average increase in MBA scores was higher in the intervention group. The average fatigue value in the group using breastfeeding pillows the value of fatigue was much lower than the group that did not use breastfeeding pillows.

Table 2. Baseline screening pre test and post test MBA, and Fatigue in each group

Research variables	Pre test (n = 30)	Post test (n = 30)	p-value
	Mean ± SD	Mean ± SD	
The mean scores MBA in intervention group	7.86±1.33	9.80±0.48	0.000
The mean scores MBA in control group	8.33±1.49	8.66±1.19	0.000
The mean scores for fatigue in the intervention group	12.70±3.75	7.53±4.29	0.000
The mean scores for fatigue in the control group	13.16±1.66	11.23±4.29	0.003

3. Analysis of the effect of nursing pillows on the MBA and Fatigue

Table 3 shows there are significant differences between MBA values ($p = 0.000$), and fatigue ($p = 0.002$). The mean difference between the pretest and posttest MBA scores in the intervention group was higher (1.93) than in the control group (0.53). The mean value difference between pretest and posttest fatigue in the intervention group was higher (5.16) than in the control group (1.93). The decrease in fatigue in the intervention group was higher than the control group.

Table 3. Mean difference post test and pre test MBA, and fatigue

Research variables	Intervention group (n = 30)	Control group (n = 30)	p-value
	Mean ± SD	Mean ± SD	
Mean difference score MBA	1.93±1.33	0.53±0.68	0.000
Mean difference score fatigue	5.16±4.16	1.93±3.30	0.002

Discussion

The MBA includes an assessment of the initial signaling of breastfeeding and the introduction of signs by the mother and baby in breastfeeding process¹⁰. Table 3 shows the mean difference between MBA scores in the intervention group was higher (1.93) than in the control group (0.53) p value ($p = 0.000$). These results are in accordance with Muliarthini et al¹¹ that showed use of ergonomic pillows can help increase a baby's motivation, satisfaction and optimize on the breastfeeding process. The position of the baby's, and attachment are very important to increase the success of breastfeeding and prevent nipple blisters, pain, and mastitis. One sign of true attachment is the presence of effective baby suction, which is slow, deep, and there is a pause¹². The sign that the baby is suckling properly is mother feels the sensation in breast being attracted, the baby sucks with rounded cheeks, does not appear to be suffocating, the baby's jaw moves smoothly while sucking, and the baby swallows¹³. The use of nursing pillows helps support the baby's body, so that the baby's mouth is in a position that is in accordance with the nipple¹⁴. Positioning and attachment of infants during breastfeeding is one of the recommendations to reduce nipple pain, increase the duration of breastfeeding, and reduce breastfeeding problems¹⁵.

Kent et al¹⁶ study stated attachment and positioning of the baby will help optimize the flow of breast milk and encourage increased milk production. There are three recommendations to optimize the flow of breast milk: 1) earlier skin-to-skin contact, 2) ensure that the mother is physically and psychologically comfortable, and 3) ensure that the baby is supported in a comfortable

position. Rahim et al¹⁷ stated that success of the breastfeeding process depends on accuracy of position and attachment of baby to mother's breast and the ability of the baby to suck.

Maternal fatigue is a feeling of lack of energy, continuous fatigue, and decreased capacity for physical and mental work at the usual level. Researchers identified signs of physical and psychological fatigue over the past 2 weeks postpartum. Table 3 shows that the mean value difference between pretest and posttest fatigue in the intervention group was higher (5.16) than in the control group (1.93) p value ($p = 0.002$). In the group that uses a breastfeeding pillow the level of fatigue is lower than the group that does not use a breastfeeding pillow, this proves the nursing pillow is very important to maintain a comfortable position during breastfeeding so that fatigue can decrease. Study Reshmi¹⁸ also proves that breastfeeding position intervention can reduce fatigue during breastfeeding, post test score vs pre test score (54.6% vs 85.2%) with a mean difference of 30.6%.

Breastfeeding is a physiological function in the reproductive cycle because newborns are very dependent on a mother¹⁹. Postpartum fatigue is influenced by the breastfeeding process and the baby's condition²⁰. According to WHO criteria, the correct position of the mother when breastfeeding is relaxed/comfortable. Mother should sit in comfortable chair and have backrest¹². The position and duration of breastfeeding causes fatigue, shoulder muscle tension and stiffness because the mother sometimes only uses her limbs to support the baby's body¹¹.

The Colson et al study²¹ Optimal maternal position for the release of primitive neonatal reflexes that stimulate breastfeeding several aspects that must be fulfilled are maternal posture, maternal comfort, body support, pain-free and tension-free during breastfeeding. Positioning at the breast has recently been defined as the relationship between the baby's body and the mother's, whereas attachment is the relationship between the baby's mouth and the mother's breast²².

Mother's posture while breastfeeding is risky. Fatigue in postpartum mothers can cause stress in parents, feelings of inadequacy and dissatisfaction, high sensitivity, loneliness, disruption of communication between parents and babies, depression, stress, maternal anxiety, slow growth of babies, delay in mothers returning to normal function, and the early cessation of the breastfeeding process²³.

Conclusions

There is a positive influence the use of breastfeeding pillows on maternal fatigue and the response of the mother and baby during breastfeeding.

Suggestions

The use of ergonomic pillows can help the mother to support the baby, help attachment, increase motivation and satisfaction of the baby, reduce fatigue and musculoskeletal complaints in the mother, and optimize the process of the mother in breastfeeding, so that the mother and baby will feel comfortable.

Conflict of Interest - None declared

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Relationship between Predisposition, Hypoxia and Chest Radiographs Abnormality on Mortality of 2-59 Months Old Children with Pneumonia

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Abstract

Background: Pneumonia in children was significant cause of death in world.^(1,2) About 150 million cases of pneumonia in under 5 years old children, 20 million cases include severe pneumonia with a high mortality rate.^(3,4) Based on the 2012 Indonesian Demographic Health Survey, infant mortality rate due to pneumonia was 40/1000 live births.⁽⁵⁾ But there are no data describing factors that contribute to pneumonia mortality in Indonesian children.

Objective: To analyze relationship between predisposition, hypoxia and chest radiographs on mortality of 2-59 months old children with pneumonia.

Methods: Retrospective case control study by taking secondary data through medical records for the period 2016-2018 in the Dr. Soetomo Hospital

Results: one hundred and four patients were enrolled, 52 patients were died (case group) and 52 patients were cured (control group). Bivariate analysis show that factor of pneumonia mortality in children were age under 12 months, non-exclusive breastfeeding, overcrowding, incomplete immunization, malnutrition, comorbidities, hypoxia and extensive infiltrates, consolidation, pleural effusions on chest radiographs. Logistic regression analysis show factors that most influenced the pneumonia mortality in children were age under 12 months, malnutrition, overcrowding and extensive infiltrates, consolidation, pleural effusion on plain chest radiographs

Conclusion: Age under 12 months, malnutrition, overcrowding and extensive infiltrate, consolidation, pleural effusion on chest radiographs were the factors that most influence the pneumonia mortality.

Key words: *Pneumonia, predisposition, hypoxia, chest radiograph.*

Introduction

Pneumonia in children is a significant cause of death and illness in the world, especially in developing countries^(1,2) About 150 million cases of pneumonia in

under 5 years of children, 20 million cases include severe pneumonia with a high mortality rate.^(3,4) According to the WHO, pneumonia is the biggest cause of death in children worldwide, which is around 1.2 million under 5 years per year.⁽⁶⁾ In poor and developing countries, about 11.5% incidences of severe pneumonia with a high risk of death.^(1,4) Based on the 2012 Indonesian Demographic Health Survey (SDKI), infant mortality rate due to pneumonia was 40 / 1,000 live births.⁽⁵⁾ However until now, there are no data describing the factors that contribute to pneumonia mortality in Indonesian children.

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Some study showed that factors related to pneumonia mortality included predisposing factors, hypoxia, chest radiographs and organ dysfunction, young age ≤ 6 month, malnutrition, present of comorbid and sign severe infection (consolidation on chest x ray).⁽⁷⁻¹⁰⁾ Identifying factors associated with pneumonia mortality in children are important, because there are many child suffered pneumonia often present with life-threatening complications. This is the reason to analysis of the relationship of predisposing factors, hypoxia and chest radiographs on pneumonia mortality in children aged 2-59 months. By understanding the factors related to pneumonia mortality, it may help health workers diagnose quickly and appropriately provide treatment and evaluation of pneumonia and finally reduce mortality due to pneumonia.

Material and Methods

This was retrospective case-control study. All children diagnosed with pneumonia and treated at the Child Health Department of Dr Soetomo Hospital Surabaya from January 2016 until December 2018. Data were obtained from medical records of children under 2-59 old months treated at Dr Soetomo Hospital due to pneumonia from January 2016 until December 2018. Samples were taken from children with a clinical diagnosis of pneumonia who met the inclusion criteria at the time of the study.

Inclusion criteria in this study is children aged 2 to 59 months with diagnosis of pneumonia. Inclusion criteria for case group is children who died while being treated. Inclusion criteria for control group is children with a diagnosis of pneumonia who cured or recovered. Patients with hospital-acquired pneumonia and incomplete medical record data were excluded from the study.

Various pneumonia predisposing factors, presence of hypoxia, and chest radiographs related to pneumonia were obtained from medical record. Premature was defined as a baby born with a gestational age <37 weeks. Low Birth Weight was baby with birth weight <2500 grams. Exclusive breastfeeding was

defined if the children only breast milk for 6 months without supplementary feeding. Exposure to cigarette smoke if the family members have smoking habits. Overcrowding was declared if there are more than 7 people in one house. Comorbidities was defined if one of the cerebral palsy, congenital heart disease, HIV, GERD and Down syndrome were found. The nutritional status categorized as malnutrition or well nourished based on the 2006 WHO curve. Immunization status was declared complete if the child has received mandatory immunization against Measles, DPT and Hib according to the age of the patient. Hypoxia was defined with SpO₂ or SaO₂ below 90%. Radiological features of pneumonia was evaluated by chest radiological examination.

Bivariate analysis was used to see the relationship between independent variables and dependent variables using the analysis of the Chi square test, Fisher's exact test and Mann Whitney test. Multivariate logistic regression test was used to find out the most appropriate factors that influence the mortality. The Level of significant was expressed at 95% confidence interval.

Result

This study was an retrospective case-control study design using secondary data through medical records for the period of 2016-2018. A total of 775 patients were diagnosed with pneumonia during the 2016-2018 period.

Table 1 showed The basic characteristics of our study. The proportion of gender and age of two groups were equal. Table 2 showed results of univariate analysis, the mortality significant factor for children with pneumonia include the age less than 12 months, the presence of comorbidities, non-exclusive breastfeeding, overcrowding, incomplete immunization, malnutrition and hypoxia also chest x rays.

In Table 3, Multivariate logistic regression method showed that under 12 months of age, high number of people in the family, malnutrition, extensive infiltrates, consolidation and pleural effusion in chest radiographs had significant results in child mortality pneumonia.

Table 1. Subject characteristics.

Karakteristik	Number	%
Gender		
· Male	54	52
· Female	50	48
Age		
· 2 - <12 months	50	48,1
· 12 – 59 months	54	51,9
Gestasional Age		
· Premature	24	23,1
· Term Infant	80	76,9
Birth Weight		
· < 2500 gram	29	27,9
· ≥ 2500 gram	75	72,1
Exclusive breastfeeding		
· No	51	49,0
· Yes	53	51,0
Exposure Cigarette smoke		
· Yes	56	53,8
· No	48	46,2
Overcrowding		
· Yes	23	22,1
· No	81	77,9
Immunization		
· Incomplete	64	61,5
· Complete	40	38,5
Comorbidities		
· Present	53	51
· Non-present	51	49
Nutritional Status		
· With Malnutrition	42	40,4
· Well nourished	62	59,6
Hypoxia		
· < 90 %	21	20,2
· > 90 %	83	79,8
Chest Radiography Finding		
· Minimal Infiltrate	67	64,4
· Extensive Infiltrate	12	11,5
· consolidation	15	14,4
· Pleural Efussion	10	9,6
· Empyema	0	0
· Pneumothorax	0	0
· Lung Abscess	0	0

Table 2. Mortality factor for children with pneumonia using bivariate analysis

Risk Factor	Outcome		P	Odds Ratio	95% CI
	Died	Cured			
Age					
· 2 - <12 months	33	17	0,003	3,576	1,593-8,029
· 12 – 59 months	19	35			
Gestational Age					
· Premature	15	9	0,245	1,937	0,760-4,939
· Term Infant	37	43			
Birth Weight					
· < 2500 gram	15	14	1,00	1,100	0,467-2,594
· ≥ 2500 gram	37	38			
Exclusive breastfeeding					
· No	36	15	<0,001	5,550	2,394-12,864
· Yes	16	37			
Exposure Cigarette smoke					
· Yes	31	25	0,325	1,594	0,733-3,465
· No	21	27			
Overcrowding					
· Yes	17	6	0,018	3,724	1,330-10,423
· No	35	46			
Immunization					
· Incomplete	39	25	0,009	3,240	1,412-7,435
· Complete	13	27			
Nutritional Status					
· With Malnutrition	34	8	<0,001	10,389	4,036-26,741
· Well nourished	18	44			
Comorbidities					
· Present	40	13	<0,001	10,000	4,065-24,598
· Non-present	12	39			
Hypoxia					
· < 90 %	19	2	<0,001	14,394	3,142-65,937
· > 90 %	33	50			
Chest Radiography Finding*					
· Minimal Infiltrate	19	48	<0,001		0,000-0,028
· Extensive Infiltrate	11	1			
· consolidation	13	2			
· Pleural Effusion	9	1			
· Empyema	0	0			
· Pneumothorax	0	0			
· Lung Abscess	0	0			

*use Mann Whitney test

Table 3. Mortality factor for children with pneumonia using multivariate analysis

Risk Factor	P	Odds Ratio	95% CI
Age · 2 - <12 months · 12 – 59 months	0,010	11,789	1,820-76,357
Gestational Age · Premature · Term Infant	0,106	0,147	0,014-1,504
Exclusive breastfeeding · No · Yes	0,403	2,440	0.301-19,782
Overcrowding · Yes · No	0,048	10,155	1,025-100,625
Immunization · Incomplete · Complete	0,467	0,386	0,030-5,028
Nutritional Status · Malnutrition · Well nourished	0,003	20,201	2,842-143,593
Comorbidities · Present · Non present	0,066	5,125	0,898-29,233
Hypoxia · < 90 % · > 90 %	0,765	1,476	0,115-18,931
Chest Radiography Finding · Extensive Infiltrate · Consolidation · Pleural Effusion · Minimal Infiltrate (reference)	0,005 0,034 0,001	107,409 56,926 219,511	4,121-2799,601 1,351-2399,193 8,812-5468,058

*Logistic regression, significant if p<0.05

Discussion

In this study, mortality significant factor for pneumonia were age less than twelve months, overcrowding, incomplete immunization, non-exclusive breastfeeding, malnutrition, comorbidities, hypoxia, chest radiographs findings.

Study in India, it was found that the relationship between age and children with pneumonia had died, especially in children aged 2-12 months with $p < 0.005$. There are fewer children who die in the older age groups. This shows that as age increased, the respiratory tract will become wider and the defense mechanism of the respiratory tract more mature.⁽¹¹⁾

Non-exclusive breastfeeding was an risk factor associated with the pneumonia mortality in our study. In previous study also showed significant relationship between non-exclusive breastfeeding and the mortality of children suffering from pneumonia with a p value < 0.001 .⁽¹¹⁾ Breast milk have effect on systemic immune system with multiple mechanisms including maturational, antimicrobial actions, immuno-modulatory and anti-inflammatory.⁽¹²⁾ Malnutrition also as mortality factor has showed in previous study.^(13, 14) In our study it was risk factor for determining mortality pneumonia. It is seems malnutrition cause an imbalance production of antibody, decreasing of lymphocytes, complement production, immunoglobulin A, interferon, T cells, and interleukin receptors.⁽¹⁵⁾ This conditions can influence body response against the infection.

Overcrowding at home cause prolonged exposure to pathogen. In our study it was risk factor for determining mortality pneumonia. A study showed a significant relationship between the number of people in the family and the mortality of children suffering from pneumonia with a p value < 0.022 .⁽¹¹⁾ Immunizations provide protection againts childhood pneumonia. An study in India, an relationship was found between immunization and the mortality of children suffering from pneumonia with value of $p = 0.057$.⁽¹¹⁾

In this study, fifty children with comorbidities, most of them have congenital heart disease. Cardiac complications was also a direct or fundamental cause of death in 27% of pneumonia-related deaths.⁽¹⁶⁾ In our study hypoxia was risk factor for determining mortality

pneumonia. A previous study showed significant relationship between hypoxia and the mortality of children suffering from pneumonia with p value < 0.001 .⁽¹¹⁾ Mechanism of hypoxia in pneumonia was ventilation and perfusion mismatch in the pulmonary consolidation region. Hypoxia and dehydration caused hemoconcentration, lack of peripheral perfusion, increased metabolic acidosis will worsen general conditions and increase mortality.⁽¹⁷⁾

In this study showed a significant relationship between mortality with extensive infiltrates ($p = 0.007$) and consolidation ($p = 0.012$) and pleural effusion ($p = 0.005$). An other study found association between abnormal chest radiographs (infiltrates, consolidation) and the pneumonia mortality with a value of $p = 0.001$.⁽¹¹⁾ Mortality has a statistically significant relationship with bilateral consolidation ($p = 0.00$) and bilateral pleural effusion ($p = 0.01$).⁽¹⁸⁾

Low birth weight, gestational age, exposure to cigarette smoke were not significantly associated with pneumonia mortality in this study. Prematurity and early term have significant relationship with the death of children aged 29 - 364 days, especially deaths caused by infections, respiratory disorders, and other disorders, whereas in 1-5 years old children mortality did not show significant results.⁽¹⁹⁾ Prematurity has significant relationship with child mortality in the first year of age (all cause mortality). Whereas at the age of 1-4 years there was insignificant results and insufficient evidence was found for deaths over the age of 4 years.⁽²⁰⁾

Previous study showed low birth weight was associated with mortality in under 1 year old children (HR 0.28; CI 0.27-0.29; $p < 0.001$) and over 15 years old children (HR 0.88; CI 0.78-0.99; $p = 0.03$). While low birth weight was not associated with mortality in 1-14 years old children (HR 0.98; CI 0.82-1.12; $p = 0.84$).⁽²¹⁾ There was no significant relationship between pneumonia and exposure to cigarette smoke because the majority of smokers in the family are fathers and the relatively longer time spent by fathers outside the home.⁽²²⁾

Conclusion

Factors affecting pneumonia mortality were age under 12 months, non-exclusive breastfeeding,

overcrowding, incomplete immunization, malnutrition, the presence of comorbidities, hypoxia, extensive infiltrates, consolidation, pleural effusion on chest radiograph.

Age under 12 months, overcrowding, malnutrition and chest radiographs (extensive infiltration, consolidation, pleural effusion) were the factors that most influence the pneumonia mortality.

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Characteristics Sectio Caesaria under National Health Insurance Program at the Non Profit Referral Hospital in Jakarta

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Abstract

Background: Sectio Caesaria (SC) at the hospital in 2014 to 2017 ranks in the 10th highest cases and costs of claim under the Indonesia National Health Insurance (JKN) program. The World Health Organization (WHO) sets the optimum SC rate of 15% by deliveries. This study aims to identify the socioeconomic and clinical characteristic of women with SC and its relationship with JKN program at the Non-Profit Referral Hospital.

Method: This research is a retrospective study with cross sectional design using a quantitative approach. A total sample of 385 cases of SC were taken from the hospital medical records in the period January 1-31 December 2018. Using univariate and bivariate-Chi Square analysis

Result: The proportion of women with SC under JKN was 67.63% whose were 57.7% received contribution assistance/PBI. Mostly in room class 3 (51.9%). Most referrals were from government primary public clinic/ Puskesmas (53.8%). Women's education mostly was high school (56.2%) with the age between 21-34 years (68.1%). Gestational ages between 37-40 weeks (72.3%) with a history of one childbirth/ primiparous (55%). ANC outside the hospital more often underwent SC (53.5%). There was a significant relationship between socioeconomic and clinical characteristics women SC under JKN at the Referral Hospital ($p < 0.05$; CI: 95%).

Conclusion: The proportion of SC deliveries at the Referral Non hospital exceeds the standards set by WHO. There is a significant relationship between socioeconomic and clinical variations mothers with SC under JKN. Quality control of SC delivery services needs to be done routinely and continuously through the application of service standards and perinatal maternal audit activities.

Keywords: SC, Socioeconomic and Clinical Characteristics, JKN

Introduction

The delivery service at the hospital for three years in a row in 2014-2017 since the JKN program was launched showed that cases and costs were the highest claims. 55% of total deliveries were SC deliveries⁽¹⁾. WHO sets the average SC standard for all countries of 10-15% per deliveries, while in government hospitals an average of 11% and in private hospitals is more than 30% (Pandya et al., 2015). Demographic and Health Indonesian Survey Data in 2012 to 2017 also showed an increase SC from 7% to 17% of total deliveries. DKI Jakarta Province is the highest with SC proportion⁽²⁾. The proportion of SC birth rates in Indonesia continues to increase in both

public and private hospitals⁽³⁾. Referral hospitals in this study have collaborated with JKN since 2014. Based on the description above, researchers are interested in identifying socioeconomic and clinical variations of mothers with SC in the JKN program at the Referral Hospital.

Methodology

This research is a retrospective study with a cross sectional design using a quantitative approach. A total sample of 385 SC deliveries was taken from the medical records in the January 1 - 31 December 2018 period. Type C hospitals were chosen because they are

a referral for SC deliveries. Hospital Ownership Type is Non-Profit. The research location was selected by one hospital which has the highest number of SC JKN claim and located in the center of city Jakarta.

Variable socioeconomic characteristic were type of JKN membership, room class, referral, education, and occupation. Clinical variables include maternal age, gestational age, parity, history of Antenatal Care (ANC). Data analysis was presented univariately and bivariate with the Chi Square test.

Validity and Reliability

The research checklist questionnaire was based on medical record records which were standard assessment tools before SC delivery at the hospital. The medical record enumerator consisted of midwives and D3 educated hospital management. Data collection was carried out through stages including: enumerator training, followed by filling in research instrument check lists by enumerators.

Result

The Non Profit Hospital is a public referral type C hospital. It has 147 beds with two operating rooms. There are 13 Obstetrics and Gynecology Specialists and 128 midwives. Total deliveries in year 2018 were 4781. The proportion of SC of total deliveries under JKN 67.63%.

Table 1 the result of Chi square test showed variations in the socioeconomic characteristics of women with SC under JKN and Non JKN in hospitals. It indicated that mostly were women with contribution assistance/PBI at 57.7%. Room class 3 is 51.9%. Referral patients were from government primary public clinic Puskesmas (53.8%). Women with SC were educated mostly in high school (56.2%) and housewives (69.6%).

Table 1. Proportion of Socio Economic Characteristics Women with SC At Non-Profit Referral Hospital Period January-December 2018

Variable			Insurance				Chi Square
Social Economy N %			JKN (260)		Non JKN (125)		p
			N	%			
Type JKN	PBI		150	57.7	0	0	0.0
	Non PBI		110	42.3	0	0	
RoomClass	Class 1 /VIP		73	28.1	125	100	0.0
	Class 2		52	20	0	0	
	Class 3		135	51.9	0	0	
Refferal	Puskesmas		140	53.8	3	2.4	0.0
	selfwillness		75	28.8	103	82.4	
	Private Clinic		45	17.3	19	15.2	
Education	Elementary		12	4.6	4	3.2	0.1
	Junior		30	11.5	9	7.2	
	HighSchool		146	56,2	43	34.4	

Cont.... Table 1. Proportion of Socio Economic Characteristics Women with SC At Non-Profit Referral Hospital Period January-December 2018

		Diploma	33	12.7	17	13.6	
		Undergraduate	38	14.6	48	38.2	
		Graduate	1	0.4	4	3.2	
	Occupation	Housewife	181	69.6	68	54.4	0.0
		Private	9	3,5	8	6.4	
		Private Employee	57	21.9	43	34.4	
		Government Employee	8	3.1	4	3.2	
		Medical Doctor	3	1.2	1	0.8	
		Nurse	2	0.8	1	0.8	

Table 2 indicate variations in clinical characteristics of women with SC under JKN in hospitals mostly done in the group age 21 - 34 years (68.1%). Gestational age between 37 - 40 weeks (72.3%) and dominant primiparous parity (55%). Women who did ANC outside the hospital more often underwent SC (53.5%). The percentage of normal placenta is 90.8%.

Table 2. Proportion of Clinical Characteristics of Women with SC at Non-Profit Referral Hospital Period January-December 2018

Variable		Insurance				Chi Square
Clinical		JKN(n=260)		Non JKN(n=125)		p
		n	%	n	%	
Age	≤ 20 / ≥ 35 year	83	31.9	29	23.2	0.07
	21 year-34 year	177	68.1	96	76.8	
Gestational	37-40 week	188	72.3	96	76.8	0.07
	<37week&>40week	72	27.7	29	23.2	
Parity	Primiparous	143	55	78	62.4	0.10
	2-3 Anak Hidup	111	42.7	41	32.8	
	>3 Anak Hidup	6	2.3	6	4.8	
ANC	ANC luar RS	139	53.5	42	33.6	0.0
	ANC di RS<4x	60	23.1	46	36.8	
	ANC di RS>4 x	61	23.5	37	29.6	

Discussion

Most of the SC deliveries at the Non Profit Referral Hospital were under JKN (69.7%). The increase in the number of SC is not in line with the government's call for efforts to reduce childbirth with the SC by Ministry of Health which states the number of SC for Educational Hospitals or Provincial Referrals fell to 20%, while for private hospitals not more than 15%⁽⁴⁾. The increasing coverage under JKN program has indeed been aligned with national policy and strategy directions of National Medium-Term Development Plan (RPJMN) by 2019 through the National Social Security System (SJSN) in the Health Sector. But this situation is certainly not in line with the Policy of MoH No.43 of 2016 and the Regulation of MoH No. 4 of 2019 related minimum service standards carried out at health facilities owned by the central government, regional government, and the private sector regarding of health service standard quality.

Indonesia Law No. 40/2004 states that JKN aims to JKN participants get the benefits of health care and protection of basic health needs in government or private health facilities that work together with BPJSK. Women delivery with SC is one the benefits felt by JKN participants. It covers without any limit on the number of pregnancies, pregnant to any age can still use this service and is not limited to membership status. The large number of Women delivery by SC will have consequences on health funding which are relatively higher than normal deliveries. The cost of SC reaches twice the cost of labor with instrumental / equipment and 2-3 times higher than the cost of vaginal delivery⁽⁵⁾. If the number of SC increases, the government burden on health financing will also increase. The total health costs subsidized by the Government in developing countries are significantly related to SC.⁽⁶⁾

There is a significant relationship between variations of characteristic socioeconomic and clinical women with SC delivery under JKN program ($p < 0.05$; CI: 95%). Women with SC deliveries under JKN in RSNP were mostly in class 3 (51.9%). Non PBI patients were more SC delivery (57.7%). Most referral from Puskesmas. It shows that referring patients in the JKN era was more in line with clinical authority than before JKN implementation. Clearer rules (PPK I) about the clinical authority those outside the authority are classified in the referral indication. However, the quality of referral indications by referral health workers needs to be re-

evaluated to be able to see the effectiveness of referral quality. Study showed the increase in women with SC deliveries were affected by age, education, socio-cultural and socioeconomic. The prevalence of SC is influenced by higher education, multiparty, non-indicative SC selection and clinical care during pregnancy at the hospital or private doctor⁽⁷⁾. Social, cultural and policy changes and psycho-social factors like anxiety about childbirth and maternal desire also influence the attitude of decision makers in carrying out SC for both patients and doctors. Agreement on indications for SC has changed in many countries⁽⁸⁾.

The results of the Chi-Square statistical test showed that there were differences between the clinical characteristics of mothers with SC deliveries under JKN and Non JKN at Non-Profit Referral Hospitals. Mothers with SC under JKN mostly were 21-34 years age group (68.1%). Gestational age between 37 weeks - 40 weeks at RSNP (72.3%). The condition of the placenta were normal placenta (93.3%). Parity were mostly are primiparous (55%). ANC done by the women with SC were outside the hospital (53.5%). This study differ from research by Sihombing using data from the National Health Research (2) which states that the age of women with SC deliveries were above the age of 35 years is 1.68 times more likely to have deliveries SC compared to those who age range of 20 -35 years and gestational age more than 42 weeks (post-term) 1.97 times more likely to occur in labor than women with SC deliveries in 38-42 weeks of gestation. As well as the parity variable showed Primiparaous mothers were 2.49 times more likely to have labor in the SC than mothers with multipara grandes. Incomplete ANC likely SC deliveries when compared with women who performed a complete ANC.

Proportion SC deliveries in Non Profit Referral Hospital exceeds the standards set by WHO which need to be controlled. Novianti, et al (2) research shows a relationship between financing and SC where mothers with health insurance show 1.12 times more likely to deliver SC than those who do not have health insurance. A study conducted by WHO in 2007 in Alexandria, Egypt showed that the chance of labor through SC is greater for expectant mothers who have health insurance or insurance and in hospitals or health care facilities that have collaborations with health insurance or insurance

providers.

Technical standardization of services becomes very important in the process of providing a qualified health service beside the cost control of health services as a concern. The Corporate Governance System in a Non Profit Referral Hospital aims to ensure that the hospital mission can run as efficiently as possible⁽⁹⁾. Health care service financing policies can influence the management and delivery process that can encourage pragmatism among doctors who have no moral objections to non-medical SC operations⁽¹⁰⁾. In the JKN era, it is expected that practitioners such as doctors at various levels of health services for encouraging mothers and families to fully understand the risk of SC deliveries, so that ownership of health insurance does not encourage an increase in the trend of SC births in Indonesia.

Monitoring and evaluating the standardization of SC services as a form of service quality control in hospitals through Clinical Pathway, fixed procedures, performance appraisal, clinical training and perinatal maternal audit activities needs to be done routinely and continuously in order to ensure the sustainability of the JKN program.

Ethical Clearance: This research has been through an ethical review procedure by the Ethics Commission for Research and Community Health Services, Faculty of Public Health, University of Indonesia. This research was declared to have passed and was feasible to be carried out with No: Ket-489 / UN2.F10 / PPM.00.02 / 2019 on June 24, 2019.

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Conflict of Interest : The authors declare that there is no conflict of interests.

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Presentation of Acute Meningitis Over Five Years Study in Al-Yarmouk Teaching Hospital

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Abstract

Objectives : Acute meningitis is life threatening medical condition. This study is to evaluate the rate of acute meningitis over five years, causative microorganism, mortality rate and its relation to age group, its prognosis so we can reflect the health status of the hospital and how to improve it.

Methods : All patients were adults presented with full blown picture of acute meningitis admitted to Al-Yarmouk Teaching Hospital, infectious ward with isolation capability ,full investigations done and proved they had acute meningitis received proper therapy followed up during hospital admission and data studied and analyzed over 5 years (1\11\2011 – 1\11\2016) .

Results : Total patients were 130 patients, (69)53% of them were male patients and (61) 47% were female. According to The pathogenic causes viral meningitis (66)51% , bacterial meningitis (45) 39% and tuberculoses meningitis (19)15% so the highest rate were viral then bacterial meningitis and least causative were tuberculose .The higher rate of mortality were among viral meningitis 8(11%) then bacterial meningitis 3 (7%) and least were tuberculoses meningitis 2 (6.3%).The least number of patients were in 2011 and highest number were in 2016 .

Conclusion : Acute meningitis occur yearly in Baghdad capital city of Iraq that mean acute meningitis is endemic in Iraq. Viral cause is the most common cause then bacterial and least tuberculoses, there were no significant difference in male to female ratio, 13 (10%) patients died which considered as high percent in spite of rapid diagnosis and good treatment the highest rate of mortality were among viral then bacterial and least among tuberculosis meningitis. There were strong relation between occurrence of acute viral meningitis and epidemic of swine influenza .

Key words : meningitis,viral, endemic; Hospital

Introduction

Acute meningitis is life-threatening inflammation of the tissue layers which surround the brain and spinal cord, and it is caused by infectious pathogens like viral, bacterial, tuberculoses and rarely by fungal or parasites, the last two usually occur in immunocompromised patients ^(1,2). Symptoms develop over the course of a few hours to days that include headache ,vomiting,

photosensitivity, disturb level of consciousness and fit may occur. the patient usually has nuchal rigidity demonstrated by neck stiffness and kernig 's sign ⁽¹⁻⁵⁾. Fever is often present.

Most common causes of acute viral meningitis are entroviruses ,herpes viruses and influenza. In the management of acute meningitis most serious life threatening are acute bacterial meningitis and herpes

simplex virus (HSV) meningoencephalitis where they must be treated rapidly to prevent the serious morbidity and high mortality^(5,6). lumbar puncture should be performed before antibiotic treatment, CSF must be sent as early as possible for study⁽⁷⁾. A CSF culture may be positive 4 hours after antibiotics, while treatment > 8 hours generally leads to negative culture⁽⁷⁾. Typical findings in bacterial meningitis include neutrophilia, elevated protein, and low glucose (less than 40% of a simultaneously sampled serum glucose)⁽¹⁻⁹⁾. The CSF study in viral meningitis includes a lymphocytosis, normal or elevated protein, and normal glucose^(9,10). The disease within less than 24 hours, HSV PCR may be falsely negative in over one-quarter of patients, and the CSF study may be absolutely normal^(11,12). So in case of high suspicion for HSV meningoencephalitis, empiric treatment must be continued and a second lumbar puncture should be done after at least 3 days' to repeat the CSF study^(13,14).

Tuberculous meningitis is most common in children aged 0 - 4 years and affects also adults and may have an acute presentation. Sometimes it may present with cranial nerve deficits, or it may have a more indolent course involving headache, meningism, and altered mental status. The prodrome is usually nonspecific, including headache, vomiting, photophobia, and fever. A high index of clinical suspicion is absolutely essential^(15,16). Diagnosis of TB meningitis is made by analyzing CSF (preferably 5 to 10ml), usually a spider web clot in the collected CSF is characteristic of TB meningitis, but is a rare finding, a high protein, low glucose and a raised number of lymphocytes. Acid-fast bacilli are sometimes seen on a CSF smear, but more commonly *M. tuberculosis* is grown in culture^(16,17). ELISPOT testing is not useful for the diagnosis of acute TB meningitis and is often false negative, but may paradoxically become positive after treatment has started, which helps to confirm the diagnosis. PCR is performed to detect mycobacterial nucleic acid⁽¹⁵⁻¹⁸⁾.

The prognosis of meningitis depends on the cause and its severity. In those with severe bacterial meningitis or a very rapid onset of the disease, the mortality rate may be high as 90%. If the patient survives, even with good management⁽¹⁹⁾, long-term disabilities may occur, like seizures or focal neurological deficit⁽¹⁸⁾. In patient with less severe condition of bacterial meningitis,

the mortality rate may reach 25%⁽¹⁹⁾ and Long-term disabilities are possible⁽¹⁹⁾. For a patients with viral meningitis, full recovery can take place in seven to 10 days⁽⁶⁻¹⁰⁾ but the mortality rate in USA. Is about 25%⁽¹¹⁾.

Methods

All were adult patients presented with typical acute meningitis, admitted to the infectious ward in AL-Yarmouk teaching hospital which is the second hospital in Baghdad, within the period from 1\11\2011 – 1\11\2016, all were investigations including complete blood count and erythrocyte sedimentation rate, C-reactive protein, biochemistry study, blood culture and sensitivity test, point of care urinalysis and stool examination, brain CT-Scan and some of them needed magnetic resonance imaging, all patients did cerebrospinal fluid study (CSF) sent for white blood cell count and its differential study, biochemical study of the CSF including protein, sugar and LDH level, CSF culture for bacterial study and its antibiotic sensitivity, CSF study for AFB stain, tuberculus solid and liquid media culture with CSF gene expert test for tuberculosis. Some cases polymerase chain reaction study (PCR) where it not always available and expensive. After that the patient received proper antibiotics for bacterial meningitis, Acyclovir for covering herpes meningoencephalitis and quadruple anti-tuberculus drugs for TB meningitis followed up in the infectious ward during course of inpatient treatment by neurologist and physician of infection specialty then followed up regularly after discharge from the hospital. All data over five years were studied and analyzed to make this paper. The statistical study done by Chi-square were used for significant association using EPI INFO VERSION 11, P-value less than 0.05 is considered as significant. There were limitation in our work because of unstable condition in Iraq some investigations were unavailable like PCR study and expensive, difficulty some times in getting proper antibiotics and many times we lose follow up of our patients due to many causes. The study was approved by the Human Research and Ethics Committee, of Anbar university related to Iraq ministry of higher education and scientific researches No. 45 in 8 may 2019.

Results

All cases are 130 adult patients.

Table 1: The sex distribution of the disease

Male patient	69	53%
Female patient sixty nine	61	47 %

Chi –square =0.9 Non significant .

P-value => 0.5 Non significant .

Table 2 : The distribution of the disease according to causative microorganism

Type of the disease	Viral	Bacterial	Tuberculous	Total number
Patient number	66	45	19	130
Percent	50.7 %	34.6 %	14.7	100%

Chi –square = 19.3

P-value < 0.0001 very high significant

Table 3: Number and rate of death of acute meningitis according to causative microorganism

Total patient 130	Viral 66	Bacterial 45	Tuberculous 19
Death patient 13	8	3	2
10 %	6.15 %	2.3%	15.5 %

Chi square = 0.74 NS.P-value => 0.05 NS.

Table 4: Disease according to age of fifty years

Age group	Viral		Bacterial		Tuberculous		Total	
	No.	%	No.	%	No.	%	No.	%
Patients age < 50 years	40	30	31	2.38	15	11.53	88	66
Patients age > 50 years	26	20	14	10.7	4	3	44	34
Chi- square P-value	3.22 0.07 NS.		13.16 0.00028 Highly Significant		12.74 0.00035 Highly Significant		29.33 < 0.000001 Highly significant	

Table 5: Number and rate of patients over years

Total year	2011	2012	2013	2014	2015	2016	Total
Number of patient	9	20	25	21	30	25	130
Percent of patient	7%	15%	19%	16%	23%	19%	100%

Chi Square = 14 d.f. = 5 significant

P=value =0.014 significant

Discussion

This study was done in AL-Yarmouk teaching hospital. the second hospital in Baghdad the capital of Iraq, over five years. All cases admitted to infectious ward with cooperation of infectious physicians and neurologist, all patients were 130 cases the male patient 69 (53%) while female patients 61 (47%) the Chi square = 0.9 and P-value > 0.5 so the sex distribution of the disease statistically is insignificant that means the disease both sexes in similar level so sex variation of the disease is invariable. The prevalence of the disease according to its causative micro-organism were: The viral 66 (59%), bacterial 45 (32%) then tuberculous 19 (9%) cases. The highest prevalence were viral meningitis that agreed with international studies⁽¹⁻¹²⁾ because the viral infection is the commonest cause of upper respiratory system infection and it may cause viraemia then systemic infection and it may be complicated to acute meningitis and it is the most common infection all over the gob⁽¹⁻¹⁸⁾ and there are epidemic and pandemic viral infection over seasons of the year like H5N1 (Avian influenza) virus and H1N1 virus (Swine influenza)⁽⁵⁻¹⁵⁾. the prevalence of viral infection in the communities is higher than other micro-organisms so the prevalence of acute viral meningitis is higher than other types. The prevalence of acute viral meningitis according to WHO was 6.7 per 100 000⁽¹⁶⁻¹⁸⁾ while in Iraq from this study was 12 per 100 000 so the prevalence is about near double the national studies. The prevalence of viral meningitis were mildly increased below the age of 50 years 40 (30%) while 26 (20%) of cases above the age of 50 years, the Chi square is 3.22 and P-Value was 0.07, where it insignificant for age. Regarding acute bacterial meningitis it was (45) 34.6% cases made it the second causative factor for acute meningitis, it was more infectious to the age below 50

years. there was 31 cases (2.38%) below and 14 (10.7%) cases above 50 years of age, Chi square 13.16, P-value is 0.00028 so it is highly significant and this may be explained that the younger age group are more active in the communities and more susceptible to be contact with infected cases. Acute bacterial meningitis in this study was the second highest prevalence because it may occur secondary to acute viral infection and get entry to meninges and cause infection⁽¹⁶⁾ or it may be due to decrease health hygiene status of the community as a sequel of many wars in Iraq. The mortality rate of acute bacterial meningitis is 3 patients of 45 patients (2.3%) it was the least percent of mortality in compares with other causative microorganisms because good orientation of medical staff with early diagnosis and treatment.

tuberculosis meningitis is the third cause of acute meningitis 19(9%) cases. The age distribution of infection is 15 cases (11.53%) below 50 years and 4 (3%) above the age of 50 years the Chi square were 12.74 and the P-value 0.00035 which is highly significant and this may be explained that the younger age group in our society are living under stressful conditions because the recurrent wars and many of them are heavy hand workers doing their job with low hygienic Status and do not care about their health and diet making them more susceptible to such infection. The mortality rate of these patients 2 of 19 cases (15.5%) where it the second cause of mortality of acute meningitis. These case raised up and this due to decrease health hygiene status of the community as complications of wars in the country with reduce systemic immunity in the community with good orientation of medical staff about the disease and its management. This study done from 2011 -2016 where the highest prevalence were in 2015 cases 30 (23%) at that year there were epidemic outbreak of H1N1 viral

infection⁽¹⁶⁾ and we think it may be complicated to acute viral meningitis where the viral cause is the main cause of acute meningitis. The least prevalence of acute meningitis in the year 2011 where it was 9(7%) cases and it was not associated with influenza outbreak at that year⁽¹⁶⁻¹⁹⁾, while in 2013 and 2016 25 (19%) where the prevalence of acute viral meningitis in the community is the second number and in the percent over the year sequences and at that years it was associated with H1N1 virus epidemicity⁽¹⁵⁻¹⁹⁾ that it may lead to increase number acute viral meningitis as a complication of swine influenza. The number was less in the year 2012, 2014 as 20 (15%) and 21 (16%) respectively it was associated with less cases of swine influenza at that years no registration of swine influenza cases from WHO reports and Iraqi ministry of health reports at that years⁽¹⁶⁻¹⁹⁾. So there was strong relationship between prevalence of acute viral meningitis and swine influenza epidemic that may indicate that H1N1 viral infection may be complicated to acute viral meningitis but may need further study in this field. When swine influenza occurs it involves upper and may involve lower respiratory system and cause viremia and both have good chance to get through meninges and infect it and this may be related to increase prevalence of mortality over acute viral meningitis 8 (6.15%) cases because swine influenza associated with high mortality in high comorbid cases and extreme of ages and chronic lung diseases. No study proved that viral infection increases the incidence of tuberculosis but it occurs in immunocompromised patients or in direct contact patients so the prevalence of tuberculous meningitis was less 19 (9%). So acute meningitis is endemic in Iraq like Hydatid cyst⁽²⁰⁾ and brucellosis⁽²¹⁾.

Limitation

Some data might have been missed, some time we have difficulties in investigations and some proper antibiotics due to unavailability in general hospital due to reduced infrastructure in the country after many wars.

Conclusion

Acute meningitis presentation is endemic in Iraq. There was strong relationship between swine influenza outbreak and acute meningitis rate as a complication which in turn may be related to increased mortality in acute viral meningitis so we need further study in this field.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of

both MOH and MOHSER in Iraq

Conflict of Interest: Non

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