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The Nitte University Journal of Health Science (NUJHS) is a peer-reviewed indexed, open access, quarterly research publication. The annual subscription for NUJHS is Rs 1,000/- (4 issues). DDs / Checks payable to Nitte University Journal of Health Sciences, Syndicate Bank, ABSMIDS Branch, Deralakatte can be mailed to Dr. Arunachalam Kumar, Editor, NUJHS Journal Office, K. S. Hegde Medical Academy, Mangalore 585018, India. Single copies are available on payment of Rs. 300 each, by cash or check at the Journal Office.
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INCIDENCE OF LOSS OF ANTERIOR TEETH DUE TO CARIES IN SOUTH INDIAN POPULATION IN 2009

Ashwitha Punja1, Mithra N. Hegde2, Nidarsh D. Hegde3, Nanditha Hegde4 & Jemsily Prince4

1Professor, 2Senior Professor & HOD, 3Post Graduate Students, Department of Conservative Dentistry & Endodontics, A. B. Shetty Memorial Institute of Dental Sciences, Nitte University, Deralakatte, Mangalore - 575 018

Correspondence:
Mithra N. Hegde
Senior Professor, Department of Conservative Dentistry & Endodontics
A.B. Shetty Memorial Institute of Dental Sciences, Nitte University, Deralakatte, Mangalore - 575018
Mobile : +91 98452 84411, +91 93435 61478  E-mail : drhegdedentist@gmail.com

Abstract:
Aim: To evaluate the incidence of loss of anterior teeth due to caries in 2000 patients randomly selected from the South Indian population in 2009.

Material and Methods: 2000 patients were examined for the incidence of loss of anterior teeth due to caries and the recorded data was statistically analysed using Pearson Chi-Square test.

Results: Incidence of loss of anterior teeth due to caries in the population of South Canara district was found to be 16.3%. It was observed that there was increased incidence of loss of anterior teeth in age group above 65 years. No difference in incidence of anterior tooth loss was observed between urban and rural patients and also between males and females. There was high rate of replacement for the missing lost anterior teeth.

Conclusion: This study showed that less than one fourth population of South Canara district had missing anterior tooth due to caries. Since anterior teeth occupies a strategic position in the dental arch, it is necessary to know the caries prevalence in this tooth and take adequate measures to prevent its progression and/or development of new carious lesions.

Keywords: Caries incidence, anterior teeth, South Canara District.

Introduction:
The anterior tooth occupies a strategic position in the dental arch. They help in maintaining arch continuity, give fullness and youthfulness to the face and maintain proper vertical dimension of face. Tooth loss diminishes oral functions and the quality of life. It causes difficulty in eating, speaking, affects the appearance and personality of a person. Hence it should be treated with concern.

Tooth loss is no longer considered an acceptable consequence of aging. One must understand its determinants before assessing the risk factors leading to premature tooth loss and should institute remedial action to avoid it⁴. The purpose of this study was to determine the incidence of loss of anterior teeth in South Canara population and to identify the differences between the various age groups, gender and between urban and rural settings. Another factor studied was the number of people having the replacement for the missing teeth. This was to find out the level of awareness of dental facilities among the lay public.

Aims and Objective of the Study:
1. To evaluate the incidence of loss of anterior teeth due to caries
2. The effect of age, location and gender on the incidence of loss of anterior teeth due to caries.
3. To study the status of replacement of the lost-Anterior Teeth.

Materials and Methods:
This is an analytical epidemiological study conducted on 2000 patients randomly selected from the patients visiting the Department of Conservative Dentistry and
Endodontics, A.B. Shetty Memorial Institute of Dental Sciences, Deralakatte, Mangalore and from the rural areas in the South Canara district.

Diagnosis and treatment planning was done for all 2000 patients after a detailed case history was recorded and a thorough intra oral and extra oral examination was performed according to the WHO format.

The patients were examined for lost anterior teeth under good illumination using visual aids (mouth mirrors, straight probe, and Shepherd’s hook explorer). A questionnaire was prepared to collect data. All the data were then coded and was subjected to statistical analysis using the Pearson Chi-Square test. The SPSS 15 software package was used to perform the statistical and epidemiological calculations.

Results:
Out of the 2000 patients examined 326 of the cases had loss of anterior teeth, giving an overall incidence of missing anterior teeth of 16.3%. (Table 1)

Statistical analysis showed that anterior tooth loss was more prevalent in the age group of above 65 years (54.1%). (Table 2)

Incidence of lost anterior teeth in urban areas was 15.9% and in rural areas it was 17.6%. The difference in locations was found to be not statistically significant. (Table 3)

It was observed that there was no statistically significant difference in anterior tooth loss between males and females (p-value 0.8191) (Table 4)

The replacements given for the lost anterior teeth were 88.3% which showed statistical significance (Table 5).

Discussion:
This study aimed at finding the overall incidence in the loss of anterior tooth due to caries, and incidence of tooth loss in different age groups, location and gender and the replacement of affected tooth.

In this study the incidence of loss of anterior teeth was found to be 16.3%. Similar results were reported by Heft and Gilbert in Florida. In contrast to this the incidence of lost anterior teeth was found to be much less (4.3%) in a study done by Ismail et al in Southwestern HHANES.

In this study the incidence of lost anterior teeth was highest in the age group above 65 years (54.1%). Similar result was found in the study conducted by Heft and Gilbert in Florida. The difference found between the younger and older age groups can be partly attributed to the fact that caries and periodontal diseases have cumulative effect on oral tissues.

This study showed no statistical difference with loss of anterior teeth among the urban and rural population. In urban areas, regular preventive dental check-ups and immediate treatment helps in retention of their teeth. The increase in the number of the charitable rural satellite centres and oral health awareness programmes help the rural population to improve their dental health.

Table 1: Incidence of Missing Anterior Teeth

<table>
<thead>
<tr>
<th>Missing anterior teeth</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>326</td>
<td>16.3%</td>
</tr>
<tr>
<td>No</td>
<td>1674</td>
<td>83.7%</td>
</tr>
<tr>
<td>Total</td>
<td>2000</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 2: Incidence of Missing Anterior Teeth in the various Age Groups

<table>
<thead>
<tr>
<th>Age Groups</th>
<th>Missing anterior teeth-Yes</th>
<th>Missing anterior teeth-No</th>
<th>Total</th>
<th>% of missing anterior teeth in each group</th>
</tr>
</thead>
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<tr>
<td>0-14 years</td>
<td>2 (.1%)</td>
<td>9 (.5%)</td>
<td>11 (.6%)</td>
<td>18.2%</td>
</tr>
<tr>
<td>15-25 years</td>
<td>41 (.21%)</td>
<td>485 (24.3%)</td>
<td>526   (26.3%)</td>
<td>7.8%</td>
</tr>
<tr>
<td>26-35 years</td>
<td>76 (3.8%)</td>
<td>554 (27.7%)</td>
<td>630   (31.5%)</td>
<td>12.1%</td>
</tr>
<tr>
<td>36-45 years</td>
<td>67 (3.4%)</td>
<td>353 (17.7%)</td>
<td>420   (21.0%)</td>
<td>16%</td>
</tr>
<tr>
<td>46-55 years</td>
<td>79 (4.0%)</td>
<td>192 (9.6%)</td>
<td>271   (13.6%)</td>
<td>29.2%</td>
</tr>
<tr>
<td>56-65 years</td>
<td>41 (2.1%)</td>
<td>64 (3.2%)</td>
<td>105   (5.3%)</td>
<td>39.04%</td>
</tr>
<tr>
<td>Above 65 years</td>
<td>20 (1.0%)</td>
<td>17 (.9%)</td>
<td>37    (1.9%)</td>
<td>54.1%</td>
</tr>
<tr>
<td>Total</td>
<td>326 (16.3%)</td>
<td>1674 (83.7%)</td>
<td>2000  (100.0%)</td>
<td>16.3%</td>
</tr>
</tbody>
</table>

Chi-square value = 147.530, p-value = < 0.05 (Significant)
No difference in incidence of tooth loss was observed between the males and females. Over the years dental care has changed and provision of curative care has increased hence the replacements given for the lost anterior tooth (88.3%) was significant. Hence the interrelationship between all these factors and their effect on oral health has become complex.

This epidemiological survey was conducted on 2000 patients randomly selected from the South Canara district, who were examined for the incidence of loss of anterior teeth due to caries. A comparative evaluation was done to correlate the incidence of loss of anterior teeth due to caries in different age groups, locations and gender.

It was concluded that:
1. Less than one fourth of the population of south Canara district had missing anterior tooth due to caries (16.3%)
2. The incidence of lost anterior teeth due to caries was more in the in age group above 65 years
3. No difference in missing anterior tooth was found in patients from urban and rural areas and between males and females
4. There was a high rate of replacement for the missing lost anterior teeth.

**References:**

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**Table 3: Incidence of Missing Anterior Teeth in Different Locations**

<table>
<thead>
<tr>
<th>Location</th>
<th>Missing anterior teeth – Yes</th>
<th>Missing anterior teeth – No</th>
<th>Total</th>
<th>% of missing anterior teeth in each group</th>
</tr>
</thead>
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<tr>
<td>Peri-Urban</td>
<td>238 (11.9%)</td>
<td>1262 (63.1%)</td>
<td>1500</td>
<td>15.9%</td>
</tr>
<tr>
<td>Rural</td>
<td>88 (4.4%)</td>
<td>412 (20.6%)</td>
<td>500</td>
<td>17.6%</td>
</tr>
<tr>
<td>Total</td>
<td>326 (16.3%)</td>
<td>1674 (83.7%)</td>
<td>2000</td>
<td>16.3%</td>
</tr>
</tbody>
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Chi-square value = .826, p-value = 0.363 > 0.05 (Not Significant)

**Table 4: Incidence of Missing Anterior Teeth in males and females**

<table>
<thead>
<tr>
<th>Gender</th>
<th>Missing anterior teeth-Yes</th>
<th>Missing anterior teeth-No</th>
<th>Total</th>
<th>% of missing anterior teeth in each group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>283 (14.15%)</td>
<td>845 (42.25%)</td>
<td>1128</td>
<td>25.08%</td>
</tr>
<tr>
<td>Females</td>
<td>214 (10.7%)</td>
<td>658 (32.9%)</td>
<td>872</td>
<td>24.54%</td>
</tr>
<tr>
<td>Total</td>
<td>497 (24.85%)</td>
<td>1503 (75.15%)</td>
<td>2000</td>
<td>24.85%</td>
</tr>
</tbody>
</table>

Chi-square value = 0.052, p-value = 0.8191> 0.05 (Not Significant)

**Table 5: Number of Replacements Given For the Missing Anterior Teeth**

<table>
<thead>
<tr>
<th>Replacement</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>38</td>
<td>11.7%</td>
</tr>
<tr>
<td>Yes</td>
<td>288</td>
<td>88.3%</td>
</tr>
<tr>
<td>Total</td>
<td>326</td>
<td>100%</td>
</tr>
</tbody>
</table>

No difference in incidence of tooth loss was observed between the males and females.

Over the years dental care has changed and provision of curative care has increased hence the replacements given for the lost anterior tooth (88.3%) was significant. Hence the interrelationship between all these factors and their effect on oral health has become complex.\(^5\)

**Conclusion:**

This epidemiological survey was conducted on 2000 patients randomly selected from the South Canara district, who were examined for the incidence of loss of anterior teeth due to caries. A comparative evaluation was done to correlate the incidence of loss of anterior teeth due to caries in different age groups, locations and gender.
SYSTEMATIC REVIEW OF URINARY TRACT INFECTION CAUSED BY ACINETOBACTER SPECIES AMONG HOSPITALISED PATIENTS

Sanjeev H., Swathi N., Asha Pai, Rekha R., Vimal K. & Ganesh H.R.
1Assistant Professor, 2Post Graduate, 3Professor, 4Professor & HOD, 5Tutor
Department of Microbiology, K S Hegde Medical Academy, Nitte University, Deralakatte, Mangalore - 575 018, India.

Correspondence: Sanjeev H.
Assistant Professor, Department of Microbiology, K.S. Hegde Medical Academy, Deralakatte, Mangalore - 575 018
Phone : +91 0824 2204490-92 E-mail : drsanjeevh@gmail.com

Introduction: Acinetobacter species have emerged as important nosocomial pathogens and have been known to cause different kinds of opportunistic infections. Acinetobacter species cause a wide variety of illness in debilitated and hospitalized patients especially in intensive care units (ICU). Because of frequent resistance to aminoglycoside's, fluoroquinolone's, ureidopenicillin's and third generation cephalosporin's, carbapenem are important agents in managing Acinetobacter infections.

Materials & Methods: A systematic retrospective analysis was performed on culture positive urinary tract infections among hospitalized patients between January 2010-December 2012. Significant isolates of Acinetobacter species were included in the study and was further analyzed for antimicrobial susceptibility, associated risk factors, underlying debility and co-morbid conditions.

Results: Among the 2240 culture positive samples, Acinetobacter species was isolated from 46 patients with UTI. Tigecyline was found to be the antibiotic with highest susceptibility (91%) followed by Imipenem (69.5%), Meropenem (67.3%) and Gatifloxacin (63%). The six patients who expired had disseminated infection with highly resistant strains of Acinetobacter species. Mechanical ventilation was the predominant risk factor for severe and disseminated infection.

Conclusion: Acinetobacter infections are associated with high morbidity and mortality. Multidrug resistant Acinetobacter are common in hospitals, especially in ICU's. A feasible hospital antibiotic policy and strict adherence to it, rigorous surveillance and good hospital infection control programme is needed to control the increasing incidence of highly resistant Acinetobacter infections.

Keywords: Acinetobacter species, Mechanical ventilation, Nosocomial infections, carbapenems

Abstract:

Introduction: Acinetobacter species have emerged as important nosocomial pathogens and have been known to cause different kinds of opportunistic infections. Acinetobacter baumannii is now recognized to be the Acinetobacter genomic species of great clinical importance. They are ubiquitous in nature and are highly resistant to commonly used antibiotics. Acinetobacter species cause a wide variety of illness in debilitated and hospitalized patients especially in intensive care units (ICU). These bacteria survive for long time in the hospital environment, and there by the opportunity for cross infection are enhanced. The main site of infection is the lower respiratory tract and urinary tract, and these distributions are very similar to that of other nosocomial pathogens. Septicemia due to Acinetobacter species is gaining importance in neonates. Because of frequent resistance to aminoglycoside's, fluoroquinolone's, ureidopenicillin's and third generation cephalosporin's, carbapenem are important agents in managing Acinetobacter infections. However, there has been an alarming increase in carbapenem resistance in Acinetobacter species over the last decade. It is difficult to explain the role of Acinetobacter acquisition in the ICU, since they are ubiquitous and have tremendous colonizing capacity. In addition, the risk factors for Acinetobacter acquisition may vary in different set up with epidemic outbreak of infection or endemic colonization. The risk factors that are involved in acquisition of Acinetobacter infection, as reported by other investigators, are artificial ventilation, broad spectrum antibiotic therapy,
endotracheal intubation, parenteral nutrition and intravascular catheterization.

This study was conducted to determine the frequency of urinary tract infection (UTI) caused by Acinetobacter species in hospitalised patients, analyse their antimicrobial susceptibility and risk factors involved.

**Materials and methods:**
The study was conducted in the Department of Microbiology, K S Hegde Medical College and Hospital, Mangalore. A systematic retrospective analysis was performed on culture positive urinary tract infections among hospitalized patients between January 2010-December 2012. Significant isolates of Acinetobacter species were included in the study and was further analyzed for antimicrobial susceptibility, associated risk factors, underlying debility and co-morbid conditions.

**Results:**
During the period of January 2010 to December 2012, 6909 urine samples were received by the Clinical Microbiology laboratory. Of these, 2240 samples were culture positive, showing significant growth of bacteria or yeast like fungi. Among the 2240 culture positive samples, Acinetobacter species was isolated from 46 patients with UTI.

Among the 46 patients with Acinetobacter UTI, 24 were female and 22 were male patients. The mean age of the patients was 56.2 years. Twenty five patients were admitted to any one of the ICU for variable period of time during their hospital stay. The common causes for admission to ICU were Chronic Obstructive Pulmonary Disease (COPD) with diabetes mellitus (8), chronic kidney disease and acute kidney injury (6), stroke (5) and RTA/head injury (2). Of these 25 patients, Acinetobacter could also be isolated from blood in 4 patients and from respiratory specimen in 6 patients. Mortality was observed in 6 patients, which included 4 patients who were on mechanical ventilation. Two of the above patients had head injury due to RTA and their respiratory specimen yielded growth of Acinetobacter species. The other two deceased patients were admitted with chronic renal failure and COPD with diabetes mellitus respectively.

The predominant risk factor was presence of urinary catheter in situ (35). The commonest reason for urinary catheterization was mechanical ventilation (11) for respiratory failure secondary to post surgical complication, chronic renal disease, acute kidney injury and neurosurgical procedures. Other risk factor included prolonged hospital stay and extended use of antimicrobial agents. Diabetes mellitus was the most common (27) co-morbid condition associated with UTI.

The antimicrobial susceptibility pattern of isolate is given in Table 1.

**Discussion:**
Acinetobacter species account for a substantial proportion of endemic nosocomial infection. Multidrug resistance increasingly reported in these pathogens is posing a threat to hospitalised patients. The acquisition of multi drug resistance is related to environmental contamination and contact with transiently colonized health care providers. Carbapenem’s, like Imipenem and Meropenem, have been the drug of choice for treating infection caused by Acinetobacter species. In our study, Imipenem and Meropenem showed sensitivity of 69.5% and 67.3% respectively. The resistance to carbapenem may be mediated by hydrolysing enzymes such as OXA carbapenamases and metallo beta lactamases.

Tigecyline was found to be the antibiotic with highest susceptibility (91%) followed by Imipenem (69.5%), Meropenem (67.3%) and Gatilfoxacin (63%). Though no resistance to Polymyxin B and Colistin was noted in the current study, its clinical utility in treatment of UTI is very limited. Further, reporting of Polymyxin B and Colistin resistance can be made only by determining the MIC. Resistance to 3rd and 4th generation cephalosporin’s (82%) and aminoglycoside’s (74-78%) was uniform and very high.

Nitrofurantoin, which is widely used in treatment of uncomplicated UTI caused by Enterobactericeae, was not
found efficacious in treatment of Acinetobacter UTI.

The six patients who expired had disseminated infection with highly resistant strains of Acinetobacter species. Mechanical ventilation was the predominant risk factor for severe and disseminated infection. Four of the expired patients had Ventilator associated Pneumonia (VAP). Similar findings have been reported by studies, where Acinetobacter was responsible for 35% of VAP and majority of the patients were from ICU9.

Conclusion:
Acinetobacter infections are associated with high morbidity and mortality. Multidrug resistant Acinetobacter are common in hospitals especially in ICU’s. Though carbapenem are drug of choice in treating these infections, such resistance profiles, as seen in the study, is alarming. Alternate drugs such as Tigecycline and Polymyxin B have their own limitation.

Thus, control measures should be taken that addresses the source of infection. Attention needs to be given to simple but effective hospital infection control practices such as hand hygiene, barrier precaution, environmental cleaning and strict disinfection of patient care equipments. Unwarranted and unrestricted use of antibiotics should be checked as extended use of 3rd generation cephalosporin’s is known to increase carbapenem resistance. A feasible hospital antibiotic policy and strict adherence to it, rigorous surveillance and good hospital infection control programme are needed to control the increasing incidence of highly resistant Acinetobacter infections.

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Sensitivity (%)</th>
</tr>
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<tbody>
<tr>
<td>Amikacin</td>
<td>12 (26%)</td>
</tr>
<tr>
<td>Gentamicin</td>
<td>10 (22%)</td>
</tr>
<tr>
<td>Norfloxacin</td>
<td>06 (13%)</td>
</tr>
<tr>
<td>Gatifloxacin</td>
<td>29 (63%)</td>
</tr>
<tr>
<td>Cotrimoxazole</td>
<td>05 (11%)</td>
</tr>
<tr>
<td>Nitrofurantoin</td>
<td>06 (13%)</td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>08 (18%)</td>
</tr>
<tr>
<td>Cefotaxime-on</td>
<td>08 (18%)</td>
</tr>
<tr>
<td>Ceftazidime</td>
<td>08 (18%)</td>
</tr>
<tr>
<td>Cefipime</td>
<td>08 (18%)</td>
</tr>
<tr>
<td>Piperacillin-Tazobactam</td>
<td>08 (18%)</td>
</tr>
<tr>
<td>Imipenem</td>
<td>32 (69.5%)</td>
</tr>
<tr>
<td>Meropenem</td>
<td>31 (67.3%)</td>
</tr>
<tr>
<td>Tigecycline</td>
<td>42 (91%)</td>
</tr>
<tr>
<td>Polymyxin B</td>
<td>46* (100%)</td>
</tr>
<tr>
<td>Colistin</td>
<td>46* (100%)</td>
</tr>
</tbody>
</table>

* Susceptibility to polymyxin B and colistin should be confirmed by MIC test.

References:
INCREASED VANCOMYCIN MINIMUM INHIBITORY CONCENTRATION (MIC) AMONG MRSA ISOLATES IN A TERTIARY CARE HOSPITAL

Asha Pai K.B.¹, Sweetha N.N.², Sanjeev H.¹, Rekha R.³, Vimal K.K.⁴ & Ganesh H.R.⁵
¹Assistant Professor, ²Post Graduate, ³Professor, ⁴Professor & HOD, ⁵Tutor
Department of Microbiology, K. S. Hegde Medical Academy, Nitte University, Deralakatte, Mangalore 575018, India

Correspondence:
Asha Pai K.B.
Assistant Professor, Department of Microbiology, K.S. Hegde Medical Academy, Nitte University, Deralakatte, Mangalore - 575018
Mobile: +91 98457 31287 Phone: +91 0824 2204490-92 E-mail: ashamkamath@gmail.com

Abstract:
Introduction: Methicillin Resistant Staphylococcus aureus (MRSA) is not only an important nosocomial pathogen but also an incipient community pathogen in many geographical areas. Recommended therapeutic agent for treatment of MRSA infections are glycopeptides, in particular vancomycin. The distribution of vancomycin Minimum Inhibitory Concentration (MIC) values among MRSA isolates in our hospital is unknown. We conducted this study to determine the distribution of vancomycin MIC values among MRSA isolates from clinical samples in our hospital.

Materials & Methods: Fifty six MRSA isolates were included in the study. These isolates were obtained from different clinical samples received in the department of Microbiology over a period of six months from August 2012 to January 2013. Screening for MRSA was done by disc diffusion method using Cefoxitin disc. Determination of vancomycin MIC of all the isolates was done by macro broth dilution method.

Results: All 56 isolates were sensitive to vancomycin. Out of the 56 isolates tested, 25 (44.64%) and 12 (21.4%) had Vancomycin MIC of 1 µg/ml and 2 µg/ml respectively.

Conclusion: The high vancomycin MIC values observed among our strains are a cause of concern, as this may have an impact on the success of treatment with vancomycin.

Keywords: Methicillin Resistant Staphylococcus aureus, vancomycin MIC.
Materials and methods:
Fifty six MRSA isolates were included in the study. These isolates were obtained from different clinical samples received in the department of Microbiology over a period of six months from August 2012 to January 2013. All the isolates were identified by conventional methods. Screening for MRSA was done by disc diffusion method using Cefoxitin disc (30µg). Screening for MRSA was done by disc diffusion method using Cefoxitin disc (30µg).

In view of the fact that VISA is detected by dilution based susceptibility test methods, Determination of MIC of all the isolates was done by macro broth dilution method. Vancomycin stock solution, to a final concentration of 10,000µg/ml, was prepared in sterile distilled water. Five hundred micro liters of two fold dilution of vancomycin, ranging from 0.5µg/ml- 256µg/ml was prepared in cation adjusted Mueller Hinton broth. Five hundred micro liters of inoculum containing 10⁷CFU/ml of actively multiplying MRSA was added to each tube and incubated at 37°C for 24 hours. The final concentration of vancomycin is half the original concentration in each tube (0.25-128µg/ml). The lowest concentration of vancomycin that inhibited growth of MRSA, as detected by lack of visual turbidity, matching with negative control included with the test was taken as the MIC and recorded in microgram/milliliter. The results were interpreted according to CLSI guidelines as shown in table 1.

Results:
A total of 56 isolates of MRSA were obtained from various clinical samples. Pus and wound swabs accounted for majority of the isolates (48.21 %), followed by blood (44.64%) and urine (7.14%) samples.

The vancomycin MIC of the MRSA isolates is shown in table 2.

All 56 isolates were sensitive to vancomycin. Out of the 56 isolates tested, 25 (44.64%) and 12 (21.4%) had vancomycin MIC of 1µg/ml and 2µg/ml respectively.

Discussion:
Vancomycin is one of the very few antibiotics available for the treatment of infections caused by MRSA. After the emergence of Vancomycin Resistant Enterococci (VRE) in the 1980’s, significant concerns existed with regard to the potential for large outbreaks of VRSA, due to acquisition of VanA gene from Enterococci. However, to date, only eleven cases of VRSA have been reported, nine from the USA and one each from India and Iran. After the first reports of VISA and hetero resistant VISA (hVISA) from Japan, it did not take long for this strain phenotype to be recognized around the world. They have now been reported from various countries including the USA, Australia, South Korea, India and others.

In our study, no VRSA or VISA strains were found. However, we did not look for hVISA, as there is currently no standard guideline for the accurate detection of hVISA.

Although VRSA and VISA strains are not very common among clinical isolates of Staphylococcus aureus, there is a great concern about the emergence of Staphylococcus aureus with reduced susceptibility to vancomycin. Furthermore, analysis of clinical and microbiological data from patients for whom vancomycin therapy failed, suggest that the increasing vancomycin MIC’s, even those which are well within the susceptible range, might be a significant risk for treatment failure.

Increasing vancomycin MIC within the susceptible range was associated with a significant risk of vancomycin treatment failure in MRSA bacteraemia. Higher clinical failure in MRSA bacteraemia was noted with vancomycin MIC ≥ 1.5 µg/ml. In our study, 21.42% of MRSA had MIC values of 2µg/ml and a MIC of 1 µg/ml in 44.64% of isolates. Even though we did not correlate the clinical outcome of treatment of MRSA infection, the possibility of treatment failure, if treated with Vancomycin, cannot be ruled out and is an area of concern.

Conclusion
The high vancomycin MIC values observed among our strains are a cause of concern, as this might have an impact on the success of treatment with vancomycin.
Table 1: Vancomycin MIC interpretation criteria

<table>
<thead>
<tr>
<th>Vancomycin MIC in µg/ml</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 2</td>
<td>Vancomycin Sensitive Staphylococcus aureus (VSSA)</td>
</tr>
<tr>
<td>4-8</td>
<td>Vancomycin intermediate Staphylococcus aureus (VISA)</td>
</tr>
<tr>
<td>≥ 16</td>
<td>Vancomycin resistant Staphylococcus aureus (VRSA)</td>
</tr>
</tbody>
</table>

Table 2: Distribution of Vancomycin MIC

<table>
<thead>
<tr>
<th>Concentration of Vancomycin (µg/ml)</th>
<th>No. of isolates (n=56)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;0.25</td>
<td>1</td>
<td>1.79</td>
</tr>
<tr>
<td>0.5</td>
<td>18</td>
<td>32.14</td>
</tr>
<tr>
<td>1</td>
<td>25</td>
<td>44.64</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
<td>21.42</td>
</tr>
</tbody>
</table>

References:
1. Tiwari HK, Sen MR. Emergence of Vancomycin resistant Staphylococcus aureus (VRSA) from a tertiary care hospital from northern part of India. BMC Infect Dis. 2006; 6: 156-162.
CULTURAL BELIEFS AND SPIRITUAL WELLBEING AMONG WOMEN EXPERIENCING RELIGIOUS TRANCE

Valsarj Prabha Blessy¹ & Savitha²

¹Associate Professor, ²Assistant Professor, Department of Mental Health / Psychiatric Nursing, Manipal College of Nursing, Manipal University, Manipal

Correspondence: Savitha
Department of Mental Health/Psychiatric Nursing, Manipal College of Nursing Manipal, Manipal University, Manipal, Karnataka, India.
E-mail: chaitrachandan@yahoo.co.in & savitha.umesh@manipal.edu

Abstract:
Background: Every culture has unique ways of beliefs and practices with regard to religion and spirituality. Many rituals like possession, religious trance that are prevalent in society are considered normal especially when performed in a close community or group. Spirit possession is a culturally sanctioned, heavily institutionalized and symbolically invested means of expression in action for various ego dystonic impulses and thoughts.¹

Aim: was to assess the cultural beliefs and spiritual wellbeing among women experiencing religious trance.

Methods: A descriptive correlative survey design was used. Thirty one women who had experienced religious trance on the day of 'Siri jaatre' (Annual festival held in the temple) at Sree Veerabhadra Swamy temple, Hiriadka were selected for the study using purposive sampling technique. The instruments used for the study were Demographic Proforma, Cultural Belief Scale and Spiritual Wellbeing Questionnaire. Descriptive and inferential statistics were used for analysis of the data.

Results: Majority women were illiterate (67.7%), coolie workers (61.3%) and married (93.5%). All the women (100%) had high cultural beliefs and high spiritual wellbeing. There was high correlation (r=0.624) between cultural beliefs and spiritual wellbeing.

Keywords: Religious trance, women, spiritual wellbeing, cultural belief.

Introduction:
Spirituality and spiritual wellbeing are part of the overall wellness and health of people. It is the consensus of opinion that spirit possession is a form of hysteria. It is also a group of phenomenon, and tends to involve several members of a particular group of people within a particular setting. Spirit possession has been known and described since biblical times, and occurred in most parts of the world, both in primitive and sophisticated societies. Spirit possession is a phenomenon that is culture bound i.e. it is intimately related to the beliefs, customs and attitudes of the particular culture group in which it is found.²

Getting possessed by Siri is considered as an offering (serve) to the spirit. By doing so, they believe that the member as well as her family gets relief from their problems and receive blessings of the spirit.³

Frederick M Smith proposes that positive oracular or ecstatic possession is the most common form of spiritual expression in India, and that it has been linguistically distinguished from negative, disease-producing possession for thousands of years. In South Asia possession has always been broader and more diverse than in the West, where it has been almost entirely characterized as "demonic." At best, spirit possession has been regarded as a medically treatable psychological ailment and at worst, as a condition that requires exorcism or punishment. In South (and East) Asia, ecstatic or oracular possession has been widely practiced throughout history, occupying a position of respect in early and recent Hinduism and in certain forms of Buddhism.⁴

Almost everywhere in India, spirit possession is described
as a means of social regulation and of conflict resolution through symbolic transformation. Among religious experiences, possession cults appear as interesting phenomena for the reasons that it uncovers many aspects of social processes. Jones reported that possession rituals in South Asia are merely practiced among the lower castes populations. Therefore, possession came to be seen as a means of transcending social hierarchies and oppression through symbolic transformation.⁵

Among the various religious phenomena, which characterize these transitions the possession by spirits needs special attention as it finds frequent reference in the indigenous psychiatry. In the state of possession some unique changes occur in the body and mind of the individual at least overtly.⁶

Participation in religious trance and healing ceremonies helps in reinforcing the belief system that is consonant with the subculture of the people.⁷

Aims:

The aim of the present study was to assess the cultural beliefs and spiritual wellbeing among women experiencing religious trance thereby understanding the influence of culture in their spiritual wellbeing.

Methods and materials:

The research design adopted for this study was descriptive correlational survey design. Thirty one women who had experienced religious trance on the day of ‘Siri jaatre’ at Sree Veerabhadra Swamy temple, Hiriadka were selected for the study using purposive sampling technique. Siri is worshipped in Tulu Nadu across caste and ethnic lines. There are numerous temples dedicated to her and her progeny called Adi Alade. These Temples are the venue for the Annual Festival held in her honour called Siri Jaatre and also the Dalipalipo - a mass possession cult of women associated with her. The ‘Siri’ Epic declares Siri’s divinity and also of her progeny and she is worshipped as a Daiva (Demi goddess) across Tulu Nadu region of South West India in Temples.⁸

To conduct the research study, administrative permission was taken from Dean, Manipal College of Nursing Manipal and Temple administrator. Informed consent was obtained from each subject and confidentiality was assured by the researcher before collecting the data. Data was collected on the day of ‘Siri Jathre’.

Background information was collected by using a Demographic Proforma, constructed by the investigators, which consisted of 9 items. The Cultural belief scale is a structured tool consisted of 10 items and four point Likert scale. The options were strongly agree, agree, disagree and strongly disagree which were given a score of four, three, two and one respectively. The total score was 40, which was arbitrarily divided as low and high cultural belief as 10-19, and 20-40 respectively. The spiritual wellbeing questionnaire consisted of 16 items and it is also a four point Likert scale. The options were always, sometimes, rarely and never. The total score was 64 which were arbitrarily divided as low, moderate and high spiritual wellbeing. Seven experts validated the content of the tools. Language validity was established by translating the tools to Kannada by a professional and language expert. The re-translation to English was carried out and there were no correction. Reliability of the tool was established by computing Cronbach’s alpha and reliability co-efficient obtained was cultural belief- 0.721 and Spiritual wellbeing- 0.764 respectively. Descriptive and inferential statistics (frequency & percentage, and Sphericman’s correlation) were used for analysis of data.

Results:

The study findings shows that most (32.3%) of the subjects belonged to the age group of 40-49 years, majority (93.5%) of the subjects were married, (67.7%) were illiterate. (61.3%) of them were coolie workers. Majority of the subjects (51.6%) of them belonged to nuclear family, monthly income of the family was less than 2,000 rupees among majority of the subjects (58.1%), (48.4%) of them had a family history of trance and the duration was more than 15 years (51%). Majority of the subjects (74.2%) were also experiencing trance for more than 15 years (presented in table 1).

Keywords: Religious trance, women, spiritual wellbeing, cultural belief. - Savitha
The present study revealed that all the subjects (100%) had high cultural belief and (100%) high spiritual wellbeing (presented in table 2&3).

The study also revealed that (shown in table 4) there is a high correlation between cultural beliefs and spiritual well-being ($r=0.624$).

**Discussion:**
Present study findings shows that most of the women (32.3%) were in the age group of 40-49 years, Majority were illiterate (67.7%), coolie workers (61.3%) and married (93.5%). Most of the subjects (48.4%) had family history of religious trance and majority of them were experiencing this for more than 15 years (74.2%).

In a study conducted by Rao G on Siri possession (2002) reported that (28% ) of the women who experienced possession were in the age group of 41-50 years, (40%) of them had no education, (72%) of the women were married, (56%) had family history of possession and duration varied from 5-40 years.

Study findings also revealed that all the women experiencing religious trance had high spiritual wellbeing (100%). A comparative study by Seema et al.(2009) on measures of mental health and exploration of cognitions contradict these findings. They found that the scores of the possession group (14±5.37) were significantly lower than the comparison group (15.17±4.86) on general well-being ($t = 0.88; df = 58; p < 0.5$), suggesting poorer general wellbeing of the participants experiencing spirit possession.

High correlation between cultural belief and spiritual wellbeing ($r=0.624$) was found in this study. A study conducted by Sreekumar R. (2008) on The Pattern of Association of Religious Factors with Subjective Well-Being found that there is a significant positive correlations between religious beliefs, religious practices, and spirituality with subjective wellbeing ($r=0.498$).

**Conclusion:**
The influence of spirits or other supernatural beings as an explanation for emotional, social or interpersonal crisis is not uncommon in our culture. It is interesting to analyze its connection with underlying factors that precipitate this behavior which may throw light into this phenomenon. Culture and religion play major role in the way people think and behave. The beliefs ingrained in the culture leads to the practice of religious trance which ensures great amount of satisfaction and spiritual wellbeing among these women.

<table>
<thead>
<tr>
<th>Sample characteristics</th>
<th>f</th>
<th>%</th>
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<tbody>
<tr>
<td><strong>Age in years</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-39</td>
<td>06</td>
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</tr>
<tr>
<td>40-49</td>
<td>10</td>
<td>32.3</td>
</tr>
<tr>
<td>50-59</td>
<td>08</td>
<td>25.8</td>
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<tr>
<td>60-69</td>
<td>06</td>
<td>19.01</td>
</tr>
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<td>70 and above</td>
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<td>3.0</td>
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<td><strong>Marital Status</strong></td>
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<tr>
<td>Married</td>
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<tr>
<td>Widowed</td>
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<td><strong>Educational Status</strong></td>
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<tr>
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<tr>
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<tr>
<td>Coolie workers</td>
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<td>61.3</td>
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<td>Nonprofessional workers</td>
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<tr>
<td><strong>Type of family</strong></td>
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<tr>
<td>Nuclear</td>
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<td>Joint</td>
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<td>Above 6,000</td>
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<td>9.7</td>
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<tr>
<td><strong>History of trance in family</strong></td>
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<td>Yes</td>
<td>15</td>
<td>48.4</td>
</tr>
<tr>
<td>No</td>
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<td>51.6</td>
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<td><strong>Duration of trance among family members</strong></td>
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<tr>
<td>Less than 5 years</td>
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<td>35.48</td>
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<td>5-9 years</td>
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<td>10-15 years</td>
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<tr>
<td>Above 15 years</td>
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<td>51</td>
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<tr>
<td><strong>Duration of self- trance</strong></td>
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<td>Less than 5 years</td>
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<td>3.2</td>
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<tr>
<td>Above 15 years</td>
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<td>74.2</td>
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<table>
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<tr>
<th>Category</th>
<th>Range of scores</th>
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<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low cultural belief</td>
<td>10-19</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>High cultural belief</td>
<td>20-40</td>
<td>31</td>
<td>100</td>
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</table>

**Keywords**: Religious trance, women, spiritual wellbeing, cultural belief.
Table 3: Description of Spiritual wellbeing

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<th>Category</th>
<th>Range of scores</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low spiritual wellbeing</td>
<td>16-32</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Moderate spiritual wellbeing</td>
<td>33-48</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>High spiritual wellbeing</td>
<td>49-64</td>
<td>31</td>
<td>100</td>
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</table>

Table 4 - Correlation between cultural belief and spiritual wellbeing

<table>
<thead>
<tr>
<th>Variables</th>
<th>Median</th>
<th>±SD</th>
<th>'r' value</th>
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<tr>
<td>Cultural belief</td>
<td>64</td>
<td>2.61</td>
<td>0.624</td>
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<tr>
<td>Spiritual wellbeing</td>
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</tbody>
</table>

References:

Keywords: Religious trance, women, spiritual wellbeing, cultural belief. - Savitha
GARLIC: IT’S ROLE IN ORAL AND SYSTEMIC HEALTH

Harini K.¹, Subash Babu², Vidya Ajila³ & Shruthi Hegde⁴

¹Senior Lecturer, Department of Periodontics, ²Professor & HOD, ³Reader, ⁴Senior Lecturer, Department of Oral Medicine & Radiology, A.B. Shetty Memorial Institute of Dental Sciences, Nitte University, Deralakatte, Mangalore - 575 018, India.

Correspondence:
Harini K.
Senior Lecturer, Department Of Periodontics, A.B. Shetty Memorial Institute of Dental Sciences, Nitte University, Mangalore 575018. Karnataka, India.
Mobile : +91 97431 99994   E-mail : harinikeshav@gmail.com

Abstract:
A range of treatment modalities are available for the treatment of different oral diseases. The frequent use and misuse of currently available therapeutic agents has led to the evolution of increased incidence of adverse effects and development of resistant strains. Hence the search for an alternative option continues. Medicinal plants have been used as traditional treatment agents since ages. Garlic (Allium sativum) has been recognized for a number of therapeutic properties in the traditional system of medicine. Allium sativum is traditionally employed to treat infection, colds, diabetes, heart disease, and a host of other disorders. Clinically, it has been evaluated for lowering blood pressure, cholesterol, and glucose concentration, as well as for the prevention of arteriosclerosis and cancer. It is well known for its potent anti-inflammatory, anti-oxidant, anti-bacterial and antimutagenic properties. This article aims to review the efficacy of garlic in maintaining oral health in particular and overall health in general.

Key words: Garlic, Allium Sativum, P. gingivalis, Cardiovascular diseases.

Introduction:
Oral diseases qualify as major public health problems owing to their high prevalence and incidence in all regions of the world. An adverse oral health condition affects three aspects of daily living: 1) systemic health, 2) quality of life, and 3) economic productivity. Numerous studies have suggested that there is a strong association between oral health and systemic health. In developed countries 10% of public health expenditure is related to curative dental care. Whereas in most developing countries, expenditure to oral health care is very low; limited access to dental healthcare is generally restricted to emergency dental care or pain relief. While there has been a marked improvement in oral health in most developed countries, it is deteriorating in developing countries specially among children from low socio-economic status. With the rise in disease incidence, resistant pathogenic bacteria, opportunistic infections in immune compromised individuals and financial considerations in developing countries there is considerable interest in the development of alternative prevention and treatment options and products for oral diseases. Traditional plants and natural phytochemicals can treat bacterial infections and are considered as good alternatives to synthetic chemicals. Numerous traditional medicinal plants have been evaluated for their potential application in the prevention or treatment of oral diseases. Garlic is one of the most extensively investigated medicinal plants since ancient times. With its high trace mineral content and enzymes, sulfur containing compounds, garlic has shown anti-viral, anti-bacterial, anti-fungal and antioxidant abilities. Garlic extract has been shown to have a wide spectrum inhibitory effect on the growth of various gram-positive and gram-negative bacteria and is also active against multi-drug resistant organisms such as Pseudomonas aeruginosa, Klebsiella pneumonia, and Mycobacterium tuberculosis.

Here, we review the clinically relevant effects of garlic, focusing on potential mechanisms involved in the response to garlic and the potential clinical implications associated...
with its consumption.

Garlic is a perennial plant with white, starry flowers and bulb clusters of individual teardrop shaped cloves encased in dry skin-like papers that unite to create the bulb. The garlic bulb is the part of the plant most often used as flavoring agent and medicinal herb. Garlic can be eaten raw, chopped, minced, or juiced. It has a characteristic pungent, spicy flavor that mellows and sweetens considerably with cooking. Garlic otherwise known as *Allium sativum*, is a species in the onion genus from Liliaceae family. Garlic is grown globally, but China is by far the largest producer of garlic followed by India, South Korea, Spain, and the United States.

**Historical Perspective:**

For thousands of years, garlic has been used throughout the world as a medicine. Sanskrit records, from approximately 5000 years ago, describe the use of garlic remedies. Chinese, Egyptian, and Greek documents from Hippocrates, Aristotle and Pliny cite numerous therapeutic uses for garlic. In 1844 Theodor Wertheim, a German chemist, distilled a pungent substance from garlic and called it allyl, the Latin name for garlic. Four years later, Louis Pasteur in Paris showed that allyl could inhibit the growth of bacteria. This was a great discovery because 150 years ago, doctors had nothing to eradicate bacteria. The Babylonians, Egyptians, Phoenicians, Vikings, Chinese, Greeks, Romans and Hindus have adopted a number of therapeutic uses for this botanical (Murray 2005). Garlic was used as a remedy for intestinal disorders, flatulence, worms, respiratory infections, skin diseases, wounds, symptoms of aging and many other ailments. Garlic thus acquired a reputation in the folklore; modern science has created a large and fast growing body of scientific research on this medicinal herb. 

To date thousands of scientific articles from all over the world have gradually confirmed the traditionally recognized health benefits of garlic. Biological responses of garlic include:

- Anti bacterial
- Anti viral
- Anti fungal
- Anti oxidant
- Anti cancer,
- Anti aging effects
- Reduction of risk factors for cardiovascular diseases
- Restoration of physical strength
- Resistance to various stresses
- Stimulation of immune function.

**Chemistry of Garlic:**

The chemistry of garlic is quite complex and clinical pharmacological properties of garlic have been extensively studied. Whole garlic cloves are intact bulbs that contain an odorless, sulfur-containing amino acid derivative, a covalently bonded compound with the chemical formula $\text{C}_6\text{H}_{11}\text{NO}_3$. The primary sulfur-containing constituents in whole, intact garlic are the glutamyl cysteines and S allyl cysteine sulfoxides, including alliin.

When the bulb is crushed or cut, alliin is altered by the enzyme, alliinase and is converted into allicin. Allicin is an oily, yellow liquid that gives garlic its characteristic odor.

Typical volatiles in crushed garlic and garlic essential oil include diallyl sulfide (DAS), diallyl disulfide (DADS), diallyl trisulfide, methyl allyl disulfide, methyl allyl trisulfide, 2-vinyl-1,3- dithiin, 3-vinyl-1,2-dithiin (Fenwick and Hanley 1985) and ajoene (Block et al. 1984). At the same time, glutamylcysteines are converted to $S$-allylcysteine (SAC) via a pathway other than the alliin/allicin pathway. SAC contributes heavily to the health benefits of garlic.

**Mechanism of action of Garlic:**

Broadly the mechanisms of action of garlic in oral health care are: its role as a strong antioxidant, antibacterial, antiseptic and immune - modulatory effect.

**Antimicrobial activity of garlic against oral bacteria:**

Cavallito and Bailey confirmed that allicin is primarily responsible for the antimicrobial action of garlic. Its main mechanism of action is by blocking thiol-containing enzymes, including cysteine proteases and alcohol
dehydrogenases. Cysteine proteinase enzymes are among the main culprits in infection, providing infectious organisms with the means to damage and invade tissues. Alcohol dehydrogenase enzymes play a major role in these harmful organisms’ metabolism and survival.

The active component of garlic extract, allicin partially inhibits DNA and protein synthesis, and entirely inhibits RNA synthesis.

Garlic extract has shown to have a wide spectrum of antibacterial activity, including effects on, Staphylococcus, Streptococcus, Klebsiella, Escherichia, Salmonella, Proteus, Clostridium, Mycobacterium and Helicobacter species. Groppo FC et al demonstrated that a mouth wash containing garlic extract was more effective at reducing the total salivary bacterial count and the streptococcal mutans count.

Ghannoum MA described marked inhibitory effect of garlic against C. albicans. Bakri IM reported that garlic extract was slow and less active against oral Gram-positive species when compared to a range of Gram-negative species. This difference between gram negative and gram positive organisms is due to inability of garlic extract to invade the thick peptidoglycan layer in the Gram positive cell envelope.

Garlic extract was sensitive particularly to P. gingivalis, P. Intermedia, A. actinomycetemcomitans, F. nucleatum and had lower minimum inhibitory concentration (MICs) and minimum bactericidal concentration (MBCs) than the other gram negative organisms tested. Trypsin like activity and total protease activity are almost completely inhibited by garlic extract, apparently through allicin’s affinity for thiol groups.

According to some investigators garlic was effective against antibiotic resistant organisms. On the other hand; some investigators have demonstrated that certain mucoid bacterial strains were discovered to be resistant to allicin. Due to unidentified reasons, it was assumed that penetration of allicin into the bacteria was restrained by hydrophilic capsular or mucoid layers.

Antioxidant effects of Garlic:

Oxidative stress is recognized as one of the pathogenic mechanisms of chronic inflammatory diseases, including cardiovascular disorders and cancer. Consequently, compounds with antioxidant properties may be used to prevent oxidative stress-mediated diseases.

Abundant research has established garlic and its organosulfur compounds to be strong antioxidants. Garlic protection against oxidant induced damage can be credited to major compounds in garlic extract like S-allylcysteine (SAC) and S-allylmercapto-L-cysteine, by displaying radical scavenging activity and modulating cellular antioxidant enzyme activity.

Antioxidant properties of garlic have been demonstrated in animal disease models. Aqueous garlic extract reduces oxidative stress and prevents vascular remodeling by suppressing NAD(P)H-oxidase in the fructose-induced metabolic syndrome model in rats.

SAC also reduces lipid peroxidation and superoxide radical production, and elevates Cu-Zn-superoxide dismutase activity in 1-methyl-4-phenylpyridinium-induced Parkinsonism in mice.

In recent years, numerous human intervention studies have examined the antioxidant influence of garlic in humans. Imai and coworkers studied the antioxidant properties of three garlic preparations and organosulfur compounds and observed that aged garlic extract exhibited radical scavenging activity protecting endothelial cells from injury by oxLDL.

Dhawan V reported reduced oxLDL and 8-iso-prostaglandin F2 alpha levels, accompanied by a significant reduction in both systolic and diastolic blood pressure in hypertensive patients on two months of garlic oil supplementation.
These results suggest that garlic has potent antioxidant activity in delaying the onset and development of chronic inflammatory diseases, including cardiovascular disorders, diabetes cancer, and neurodegenerative diseases caused by an imbalance between free radical production and antioxidant defenses.

Immunomodulatory Effects:
Sufficient evidences suggest that garlic may have significant enhancing effects on the immune system. Extensive studies are conducted on animals, in vitro and in vivo. However, the human studies that have been conducted are encouraging.

Abdullah TH et al. demonstrated positive effects on immunoreactions and increase in the percentage of phagocytosing peripheral granulocytes and monocytes on using an alliin standardised garlic powder preparation. Another human study conducted on AIDS patients with an unrefined garlic extract (5-10 g/day) demonstrated a major increase in the percentage of natural killer cell activity.

Anti-inflammatory:
Agarwal et al. demonstrated suppression of the nuclear factor-kappaB activation pathway and inflammatory prostaglandins thus establishing anti-inflammatory activity of garlic.

Therapeutic applications in dentistry:
This potent anti-inflammatory, antioxidant, antibacterial effect and immunomodulatory effect of garlic suggest that it has a therapeutic potential in different oral diseases. Garlic produced a significant reduction in the inflammatory infiltrate and potentially inhibited innate immune response associated with periodontal diseases thus suggesting a therapeutic potential in this chronic inflammatory condition. Garlic can be used as a mouth wash, sub gingival irrigant and as a component in local drug delivery system. It has a great role in the treatment of periodontal diseases.

Other therapeutic applications of garlic:
Antiviral activity:
Many investigators have demonstrated antiviral activity against human cytomegalovirus, influenza virus type 3, vaccine virus, vesicular stomatitis virus and human rhinovirus type 2.

Antifungal activity:
Bakri IM et al confirmed the antifungal activity of garlic against C. albicans described by Ghannoum MA. Ledezma et al. demonstrated that ajoene, an active compound in garlic may play a role as a topical fungal agent.

Antimutagenic effects:
Garlic has known to possess anticancer activity because of its various effects on biological pathways. These include free radical scavenging, inhibition of mutagenesis and effects on cell proliferation and tumor growth. Garlic and its organosulphur compounds modulate the activity of several metabolising enzymes that activate (cytochrome P450s) or detoxify (glutathione S-transferases) carcinogens and inhibit the formation of DNA adducts in several target tissues. Numerous studies have established the role of garlic in cancer prevention particularly in relation to digestive tract cancers, including esophageal and stomach cancers.

Cardiovascular effects:
Garlic’s protective effects on cardiovascular system include:
- Inhibition of hepatic hydroxymethyl glutaryl-CoA reductase activity by alliin and allicin and reduction in LDL-cholesterol.
- Inhibition of platelet aggregation due to suppression of intraplatelet Ca2+ mobilization, an increase in cyclic AMP and cyclic GMP levels, an increase in platelet-derived nitric oxide production, and a reduction in platelet binding to fibrinogen.

Drug interactions:
Few authors have suggested that garlic affects the drug metabolism and alters their pharmacokinetics. It has been hypothesized that garlic organosulfur compounds may be able to prevent glutathione depletion, a compound necessary for liver detoxification. Sabayan et al demonstrated that garlic provides protection against
reactive oxygen species-induced stress on liver function. Sener et al showed that aged garlic can reverse oxidant effects of nicotine toxicity in rats. Maldonado et al showed that aged garlic extract, do not interfere with the antibiotic activity of gentamycin but may improve gentamycin-induced nephrotoxicity. However, as results remain inconsistent and contradictory more well-designed studies are necessary to clarify whether garlic affects the metabolism of drugs and alters their pharmacokinetics.

**Adverse effects:**

Garlic is generally considered safe but a commonly associated side effect with garlic intake is halitosis, especially when raw forms of the herbs are used. However, Mitchell reported that the odor is decreased when garlic is taken before meals. Odorless garlic formulations are available. However, odorless garlic is often prepared either by adding chemical substances to mask the odor or by cooking the garlic, which may destroy some of the active ingredients. Other side effects include nausea and gastric irritation. Although rare, garlic allergy has been attributed to the protein allin lyase, which has induced IgE mediated hypersensitivity responses from skin prick testing.

Saw et al warned not to use garlic while on anticoagulant therapy as garlic has been associated with decreased platelet aggregation and bleeding events.

**Conclusion:**

Over the years, garlic has been a part of tradition, ancient myth, and household remedies. The therapeutic properties of garlic have been known to mankind for ages. Garlic and its compounds have been found to attack multiple targets, which provide the basis for their effectiveness in many different diseases. However, the results observed in human clinical and intervention studies have been inconsistent and the risk of garlic drug interactions is attracting increasing interest. Therefore further experiments are necessary to recognize the definite health benefits and impact of garlic. By looking back into history we can apply some old world uses of garlic for new ways to improve oral and overall health.

**References**


Keywords: Garlic, Allium Sativum, P. gingivalis, Cardiovascular diseases. Harini K.
A COMPARATIVE STUDY OF TERBINAFINE ETHOSOMAL FORMULATIONS: A NOVEL APPROACH

Narayana Charyulu R.1, Mehta Satveek2, Harish N.M.3 & Amit B. Patil4

1Vice Principal & HOD, 2Student (M.Pharm - 2009-2011 Batch), 3Lecturer, 4Senior Lecturer, Department of Pharmaceutics, Nitte Gulabi Shetty Memorial Institute of Pharmaceutical Sciences, Paneer, Deralakatte, Mangalore - 575 018

Correspondence: R. Narayana Charyulu,
Vice Principal & HOD, Department of Pharmaceutics, NGSM Institute of Pharmaceutical Sciences
Paneer, Deralakatte, Mangalore - 575 018
Mobile: +91 94481 64750   E-mail: charyulun@yahoo.co.in

Abstract:
The present research work aimed at the impact of reduced vesicular size on the characteristics of ethosomes by comparing with the regular vesicular size of ethosomes as topical drug delivery vehicle to achieve optimal localized drug concentration and reduced dose frequency of the Terbinafine hydrochloride (TH), an antifungal drug. Oral use of TH contraindicated resulting from sever side effect, thus topical administration is recommended. Commercially available TH creams, lotions and sprays, have limitation of relatively short residual period at target site. The entrapment of drug in vesicles improves localization, solubility and availability of drug at the site; resulting in reduction of the dose. Ethosomes containing drug were prepared by employing higher concentration of alcohol in the form of hydroalcoholic or hydroglycolic phospholipid. Sonicated and unsonicated ethosomes were investigated for shape, particle size, and entrapment efficiency. Electronic microscope investigation not only revealed, vital evidence for presence of phospholipid vesicles in TH ethosomal systems but also displayed greater uniformity in size and shape of sonicated ethosomes than unsonicated ethosomes. Furthermore, the Comparative investigation was carried out for ex vivo skin permeation, ex vivo drug release and entrapment efficiency studies. Drug release followed zero order release rate kinetics. Drug accumulation study showed more than 19.01% of drug was deposited into skin by sonicated ethosomal formulation as compared to 2.57% by unsonicated ethosomal formulation. Sonicated and unsonicated ethosomes were found stable at refrigeration and room temperature conditions during stability studies. Drug accumulation studies in deep skin strata was found to be comparatively greater in sonicated ethosomes, which indicates higher localized drug and that in turn reduces dose frequency.

Keywords: Sonicated Ethosomes; unsonicated ethosomes; Terbinafine hydrochloride; ex vivo characterization.

Introduction:
Terbinafine hydrochloride (TH) is the allyl amine available for systemic use in the treatment of dermatophytes (Trichophyton, Epidermophyton and Microspora) including tinea infections. TH topical administration is usually recommended because commercial conventional terbinafine hydrochloride tablets are considered to be administered for a longer duration of time to achieve higher systemic absorption of drug resulting in systemic adverse side effects; since one tablet daily for 12 weeks achieves a 90% cure which is a lengthy and expensive duration of therapy. Conventional topical drug delivery systems, such as creams, lotions and spray, are known to have limitations like inadequate localization of drug within the skin to enhance the local effect or increase the penetration through the stratum corneum and viable epidermis for systemic effects. A novel approach has been recently developed by Touitou et al., to address the limitations of conventional topical drug delivery systems; in the form of Ethosome which is predominantly a lipid carrier. The importance of lipids has especially increased after realizing the utility of phospholipids which is a natural bio-friendly molecule and when collaborated with water can form diverse types of supermolecular structures. Further the research has
proved that entrapment of drug in vesicles may help to localize delivery of drug and enhance solubility and availability of drug at the site for systemic action which intern may reduce dose and systemic side effects\textsuperscript{12,3}. There are enough research articles displaying the rational use for preferring ethosomal over liposomal drug delivery system.

Hence, the present research is aimed to investigate the effect of modified vesicular size on the properties of ethosomes by comparing with the regular vesicular size of ethosomes. The modification of vesicular size is achieved by subjecting the ethosomes formulated by HOT technique to sonication using Sonicator vibra cell instrument. Both, the sonicated and unsonicated ethosomes were studies for their ability to effectively deliver drug molecules to and through the skin to the systemic circulation; this property was observed by using fluorescent probes in ex vivo permeation experiment.

Material and Method:
Soya Phospholipid purchased from Himedia Laboratories Pvt. Ltd. Mumbai; Distilled Ethanol from Samsung distillery; Rhodamine Base dye from Genuine Chemical, Mumbai; Triton X – 100 purchased from Loba Chemie Pvt. Ltd., Mumbai; Cholesterol purchased from Nice Chemicals Pvt. Ltd., Kochi; Sonicator Vibra cell, Sonics and Materials Inc., CT, USA and all the other ingredients used were of analytical grade.

1. Methods:
1.1 Preparation of unsonicated terbinafine hydrochloride ethosomes
Terbinafine hydrochloride 1 %w/v was accurately weighed then mixed with ethanol and propylene glycol and heated to 40 °C. In a separate vessel soya phospholipid was dispersed in distilled water by heating on water bath at 40 °C until a colloidal solution was obtained. Once both mixtures reached 40 °C, the organic phase was added to the aqueous phase with stirring at 700 RPM. After adding, mixing was continued for another 5 min. Temperature was maintained at 40 °C for the entire process. Total volume of the preparation was 25 ml\textsuperscript{4,5}. The formula for the different batches is given in the Table 1 and 2. The same method was adopted for sonicated ethosomes also.

1.2 Preparation of sonicated ethosomes
Ethosomes prepared by the above procedure were subjected to sonication at 4 °C using probe Sonicator in 3 cycles of 5 min with 5 min rest between the cycles\textsuperscript{12,3} (Table 2).

1.3 Preparation of rhodamine B stained ethosomes
Accurately 4 mg of rhodamine was weighed and to it ethanol (30 %w/v) and propylene glycol (10 %w/v) are mixed and heated to 40 °C. In a separate vessel soya phospholipid (0.5 %w/v) was dispersed in distilled water by heating on a water bath at 40 °C until a colloidal solution was obtained. Once both the mixtures reached at 40°C, the organic phase was added to the aqueous phase with stirring at 700 RPM. After adding, mixing was continued for another 5 min. Temperature was maintained at 40 °C for the entire process. Total volume of the preparation was 25 ml\textsuperscript{4,5}. The formula for the different batches is given in the Table 1 and 2. The same method was adopted for sonicated ethosomes also.

2. Characterization of unsonicated and sonicated ethosomes
2.1 Shape analysis
Ethosomes were examined by negative stain. A drop of the vesicular system was applied to a film coated copper grid. Phosphotungstic acid (PTA) solution was dropped onto the grid. The stained sample was examined in a Philips Tecnai 20 transmission electron microscope (Philips, Holland) accelerated at 200 kV\textsuperscript{6}.

2.2 Size analysis
vesicle size of ethosomal formulations both sonicated and unsonicated was determined by Nano Zeta Sizer (Malvern Instruments Ltd., USA)\textsuperscript{7,8}.

2.3 Entrapment efficiency
The entrapment efficiency of terbinafine hydrochloride by ethosomal formulations was determined by ultracentrifugation. Ethosomal formulations of 10 ml was mixed with 1 ml of 1 % triton X-100 solution. Each sample was vortexed for 2 cycles of 5 min with 2 min rest between the cycles. Each vortexed sample of 1.5 ml and fresh
untreated formulations were taken into different centrifugal tubes. These samples were centrifuged at 20,000 rpm for 3 h. The supernatant layer was separated, diluted with 40 % v/v hydroethanolic solution and drug concentration was analyzed at 283.5 nm in both vortexed and unvortexed samples using UV spectrophotometer (UV – 1600/1700 series)*.

The entrapment efficiency was calculated as follows:

\[
\text{% Entrapment Efficiency} = \frac{(T - C)}{T} \times 100
\]

Where:

- \( T \) = The total amount of drug that detected from supernatant of vortexed sample.
- \( C \) = The amount of drug unentrapped and detected from supernatant of unvortexed sample.

2.4 Ex vivo characterization

(a) Preparation of porcine skin
Abdominal porcine skin obtained from the local slaughterhouse (Kankanady Market, Mangalore, Karnataka) was incised and freed from fats for study. The skin was then cut into pieces of suitable size with thickness ranging from 2 mm to 3 mm and stored under frozen condition*.

(b) Drug release study from porcine skin
The ex vivo release of terbinafine hydrochloride from ethosomal formulations was studied separately using diffusion cell specially designed in our laboratory as per literature. The effective permeation area of the diffusion cell and receptor cell volume was 2.23 cm² and 100 ml respectively. The temperature was maintained at 37 ± 1 °C. The receptor compartment contained 100 ml of 40 % v/v hydroethanolic solution and was constantly stirred by magnetic stirrer at 600 RPM during 6 h. Prepared porcine skin was mounted between the donor and receptor compartments. Rhodamine base stained ethosomal formulations of 0.5 ml was applied to the skin surface and the content of diffusion cell was kept under constant stirring, then 5 ml of samples were withdrawn from receptor compartment of diffusion cell at predetermined time intervals. The receptor phase was immediately replenished with equal volume of fresh 40 % v/v hydroethanolic solution*. After ex vivo experiments, the skin was removed (2.23 cm²) and carefully cleaned with distilled water. 10 µm slices by vertical cutting were obtained by cryomicrotome. Slices were observed under a confocal laser scanning microscope (CLSM).

(d) Drug accumulation in the skin
After ex vivo release study, the treated porcine skin (2.23 cm²) was cleaned on both sides by distilled water and cut into small pieces, ultracentrifuged in 20 ml 40 % v/v hydroethanolic solution for 3 h at 20,000 RPM. The supernatant layer was separated, diluted with 40 %v/v hydroethanolic solution and drug concentration was determined using UV spectrophotometer (UV – 1600/1700 series) at 283.5 nm after suitable dilution. The receptor phase was immediately replenished with equal volume of fresh 40 % v/v hydroethanolic solution*.

(c) Penetration study from porcine skin
The ex vivo penetration of rhodamine base stained ethosomal formulations was studied separately using diffusion cell specially designed in our laboratory as per literates. The effective permeation area of the diffusion cell and receptor cell volume was 2.23 cm² and 100 ml respectively. The temperature was maintained at 37 ± 1 °C. The receptor compartment contained 100 ml of 40 % v/v hydroethanolic solution and was constantly stirred by magnetic stirrer at 600 RPM during 6 h. Prepared porcine skin was mounted between the donor and receptor compartments. Rhodamine base stained ethosomal formulations of 0.5 ml was applied to the skin surface and the content of diffusion cell was kept under constant stirring, then 5 ml of samples were withdrawn from receptor compartment of diffusion cell at predetermined time intervals. The receptor phase was immediately replenished with equal volume of fresh 40 % v/v hydroethanolic solution*. After ex vivo experiments, the skin was removed (2.23 cm²) and carefully cleaned with distilled water. 10 µm slices by vertical cutting were obtained by cryomicrotome. Slices were observed under a confocal laser scanning microscope (CLSM).

2.5. Drug release kinetic
The drug release data from the formulations was treated according to Higuchi’s equation by plotting a graph of cumulative percentage of drug released vs square root of time and calculating the correlation coefficient of
regression ($R^2$).  

2.6. Stability studies  
Stability study was carried out for sonicated and unsonicated terbinafine hydrochloride ethosomal formulations, especially for the size, shape and entrapment efficiency of the vesicles, as they are the major determinant factors in the present investigation. Two different temperature conditions were selected namely refrigeration temperature (4±2 °C) and room temperature (27±2 °C) for 4 weeks. Elevated temperature conditions above room temperature was not used to perform stability studies, as phospholipids constitute major component of the present ethosomal formulation which gets deteriorated at higher temperature. The formulations subjected for stability study were stored in borosilicate container to avoid any sort of interaction between the formulations and glass of container, which may affect the observation. The formulations were analyzed for any physical changes such as color, appearance and entrapment efficiency.

Result and discussion:  
2.1. Shape and size analysis  
The average size of unsonicated ethosomes was found out to be 332.7 nm while that of sonicated ethosomes was 76.11 nm. The shape of the unsonicated and sonicated ethosomes was spherical, but comparatively sonicated ethosomes had smaller and more uniform in vesicular size and shape than unsonicated ethosomes.

2.2. Entrapment efficiency  
The maximum entrapment efficiency in unsonicated and sonicated ethosomal vesicles was are determined by ultracentrifugation method. In unsonicated ethosomes the maximum entrapment efficiency was found to be 61.23 % in ET2 formulation containing 30 % ethanol as compared to 54.89 % and 57.043 % in ET1 and ET3 containing 20 % and 40 % ethanol respectively (Table 3). The sonicated ethosomal vesicles showed maximum entrapment efficiency of 76.43 % in ET7 containing 30 % ethanol when compared to 63.16 % and 58.93 % in ET6 and ET8 containing 20 % and 40 % ethanol respectively (Table 4). In both, unsonicated and sonicated ethosomes, it is evident that as the ethanol concentration increased from 20 % to 30 % w/v, the entrapment efficiency also increases; But with further increase in the ethanol concentration (>30 % w/v) the vesicle membrane becomes more permeable that led to decrease in the entrapment efficiency. When the result of entrapment efficiency between sonicated and unsonicated ethosomes was compared, sonicated ethosomes showed significantly high values. This proves that as the vesicle size is reduced the entrapment efficiency is increased.

2.3. Ex vivo characterization  
(a) Drug release study from porcine skin  
The Ex vivo studies were conducted only on those formulations, which have showed high entrapment efficiency. Ex vivo drug release study was conducted by diffusion method to verify the release rate and extent of the drug release from the dosage form. A perusal of Figure 1, at the end of 6 h, the sonicated ethosomes (ET7), drug release was found to be 41.16%, which is greater when compared to 12.68 % of the unsonicated ethosomes (ET2).

(b) Penetration study from porcine skin  
Unsonicated ethosomes and sonicated ethosomes were compared with the aim to study the penetration depth of fluorescent probe and the relative intensity of fluorescence into skin layers. Remarkable differences were observed 6 h after the application. The penetration depth of the fluorescent label was higher for sonicated than unsonicated ethosomal formulation. The sonicated ethosomal formulation displayed high fluorescence intensity in the stratum corneum as well as in viable epidermis than unsonicated ethosomal formulation (Figure 2). It is indicated that the sonicated ethosomal formulation can facilitate the drug to reach the deeper skin structures, such as pilosebaceous follicle.

© Drug accumulation into skin  
Drug accumulation into skin is useful parameter if the drug is intended to give subdermal action other than transdermal effect as in the case of dermal fungal infection. After the completion of the ex vivo diffusion studies, skin
was extracted and amount of drug was analyzed. Drug accumulation study showed 19.01 % of drug deposition into skin by sonicated ethosomes as compared to 2.57 % drug deposition by unsonicated ethosomes (Table 5).

2.4. Drug release kinetic
Terbinafine hydrochloride released was found to be linear and proportional to square root of time in the sonicated ethosomes. The correlation coefficient of regression showed 0.9709 for sonicated ethosomal formulation whereas for sonicated ethosomal formulation it was 0.8916 (Table 6).

2.5. Stability studies
The stability studies performed over a period of 4 weeks at refrigeration temperature and room temperature storage conditions proved that there was no change in morphological properties with respect to size and shape. Entrapment efficiency of all the sonicated and unsonicated formulations did not show any deviation from the initial drug content. Hence, all the ethosomal formulations were found to be stable.

Conclusion:
The results of the fore said investigation conclusively demonstrate the encroachment of the reduced vesicular size results in enhanced characteristics of ethosomal formulation when compared with the regular vesicular size of ethosomal formulation as topical drug delivery. Optimal localized drug concentration and higher drug entrapment efficiency was attained by reducing the vesicular size. It provides better remission from the disease and reduces the duration of therapy. However, this formulation can find a place in clinical use after clinical evaluation.

Acknowledgement:
The authors are thankful to Prof. (Dr.) C. S. Shastry, Principal, N.G.S.M. Institute of Pharmaceutical Sciences, Paneer, Deralakatte, Mangalore and Nitte University for providing necessary facilities to carry out this research project.

Table 1: Formulation of unsonicated ethosomes

<table>
<thead>
<tr>
<th>Formulation Code</th>
<th>Drug (%w/v)</th>
<th>Phospholipid (%w/v)</th>
<th>Ethanol (%w/v)</th>
<th>Propylene glycol (%w/v)</th>
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</thead>
<tbody>
<tr>
<td>ET1</td>
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<td>0.5</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>ET2</td>
<td>1.0</td>
<td>0.5</td>
<td>30</td>
<td>10</td>
</tr>
<tr>
<td>ET3</td>
<td>1.0</td>
<td>0.5</td>
<td>40</td>
<td>10</td>
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</tbody>
</table>

Table 2: Formulation of sonicated ethosomes

<table>
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<th>Formulation Code</th>
<th>Drug (%w/v)</th>
<th>Phospholipid (%w/v)</th>
<th>Ethanol (%w/v)</th>
<th>Propylene glycol (%w/v)</th>
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<tbody>
<tr>
<td>ET6</td>
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<td>20</td>
<td>10</td>
</tr>
<tr>
<td>ET7</td>
<td>1.0</td>
<td>0.5</td>
<td>30</td>
<td>10</td>
</tr>
<tr>
<td>ET8</td>
<td>1.0</td>
<td>0.5</td>
<td>40</td>
<td>10</td>
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</table>

Table 3. Drug entrapment efficiency of unsonicated ethosomes.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Absorbance*</th>
<th>Concentration C (µg/ml)</th>
<th>Amount of drug C ?DF (µg)</th>
<th>Entrapped drug E=TU/T</th>
<th>% Drug Entrapped %E= E ?100</th>
</tr>
</thead>
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<tr>
<td>Et1</td>
<td></td>
<td></td>
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<tr>
<td>Total drug (T)</td>
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<td>20.1753</td>
<td>2017.53</td>
<td>0.5489</td>
<td>54.89</td>
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<td>Free drug (U)</td>
<td>0.1856</td>
<td>9.1011</td>
<td>910.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Et2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total drug (T)</td>
<td>0.4416</td>
<td>21.6482</td>
<td>2164.82</td>
<td>0.6123</td>
<td>61.23</td>
</tr>
<tr>
<td>Free drug (U)</td>
<td>0.1712</td>
<td>8.3930</td>
<td>839.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Et3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total drug (T)</td>
<td>0.4466</td>
<td>21.8934</td>
<td>2189.34</td>
<td>0.5704</td>
<td>57.043</td>
</tr>
<tr>
<td>Free drug (U)</td>
<td>0.1918</td>
<td>9.4055</td>
<td>940.55</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Each value is an average of 3 replications.
DF= Dilution factor (100)
Table 4. Drug entrapment efficiency of sonicated ethosomes.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Concentration C (µg/ml)</th>
<th>Amount of drug C ?DF (µg)</th>
<th>Entrapped drug E=TU/T</th>
<th>% Drug Entrapped %E= E ?100</th>
</tr>
</thead>
<tbody>
<tr>
<td>ET6</td>
<td>Total drug (T) 0.4989</td>
<td>24.4571</td>
<td>2445.71</td>
<td>0.6316</td>
</tr>
<tr>
<td></td>
<td>Free drug (U) 0.1838</td>
<td>9.0100</td>
<td>901.00</td>
<td></td>
</tr>
<tr>
<td>ET7</td>
<td>Total drug (T) 0.5074</td>
<td>24.8763</td>
<td>2487.63</td>
<td>0.7643</td>
</tr>
<tr>
<td></td>
<td>Free drug (U) 0.1196</td>
<td>5.8634</td>
<td>586.34</td>
<td></td>
</tr>
<tr>
<td>ET8</td>
<td>Total drug (T) 0.4875</td>
<td>23.8976</td>
<td>2389.76</td>
<td>0.5893</td>
</tr>
<tr>
<td></td>
<td>Free drug (U) 0.2002</td>
<td>9.8148</td>
<td>981.48</td>
<td></td>
</tr>
</tbody>
</table>

*Each value is an average of 3 replications.

DF= Dilution factor (100)

Table 5. Results of drug accumulation in the skin from unsonicated ethosomes (ET2) and sonicated ethosomes (ET7)

<table>
<thead>
<tr>
<th>Formulation</th>
<th>Absorbance*</th>
<th>Amount of drug accumulated</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ET2</td>
<td>0.1309</td>
<td>6.424</td>
<td>2.571</td>
</tr>
<tr>
<td>ET7</td>
<td>0.9695</td>
<td>7.52</td>
<td>9.01</td>
</tr>
</tbody>
</table>

*Each value is an average of 3 replications.

Table 6. Drug release kinetics from unsonicated ethosomes (ET2) and sonicated ethosomes (ET7)

<table>
<thead>
<tr>
<th>Formulation</th>
<th>Higuchi’s Equation (R²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ET2</td>
<td>0.8916</td>
</tr>
<tr>
<td>ET7</td>
<td>0.9709</td>
</tr>
</tbody>
</table>

Reference:
RELATION BETWEEN SALIVARY AND SERUM VITAMIN C LEVELS AND DENTAL CARIES EXPERIENCE IN ADULTS - A BIOCHEMICAL STUDY

Mithra N. Hegde¹, Suchetha Kumari², Nidarsh D. Hegde³ & Shilpa S. Shetty⁴

¹Senior Professor and HOD Department of Conservative Dentistry and Endodontics, ²Professor, Department of Oral and Maxillofacial Surgery, A.B. Shetty Memorial Institute of Dental Sciences, ³Professor, Department of Biochemistry, K.S.Hegde Medical Academy, Nitte University, Deralakatte, Mangalore

Correspondence : Mithra N. Hegde
Senior Professor and Head, Department of Conservative Dentistry and Endodontics,
A.B. Shetty Memorial Institute of Dental Sciences, Nitte University, Deralakatte, Mangalore - 575 018. Karnataka, India.
E-mail : drhegdedentist@gmail.com

Abstract:
The aim of this study was to estimate the vitamin C levels in saliva and serum of caries free and caries active adults and to correlate the vitamin C level with DMFT index (D=decayed, m=missing, f=filled, t=teeth) index. The present study included eighty healthy adults who were divided into four groups; Control, Group- I, Group II and Group- III with a DMFT index 0, <3, <10 and > 10 respectively. Saliva and serum samples were collected from all the four groups. The vitamin C of saliva and serum was estimated by dinitro phenyl hydrazine (DNPH) method. One-way ANOVA was used to compare the vitamin C levels of saliva and serum. Only differences with ‘p’value <0.05 were considered statistically significant. Saliva and serum vitamin C level decreases with increase in caries activity and is statistically significant suggesting the powerful antioxidant property of vitamin C.

Keywords: Vitamin C, Saliva, Serum, Dental caries

Introduction:
Diagnostic procedures most commonly used in laboratory involve the analyses of the cellular and chemical constituents of blood. Saliva offers some distinctive advantages when used for diagnosis of disease. Human saliva is a fluid with many biological functions essential for the maintenance of oral health. In past scientists were more interested in studying the biological functions of saliva in the mouth than in trying to assess its possible role as an indicator of systemic or oral disease. The potential of saliva for diagnosis purpose has attracted more attentions in recent years. Saliva is armed with various defense mechanisms, such as the immunological and enzymatic defense systems. According to recent data it mirrors general health condition thus reflecting various systemic changes in the body. Locally produced proteins along with some other molecules from the systemic circulation are found in saliva. On the other hand, various amounts of blood, serum derived molecules, gingival crevicular fluid, electrolytes, epithelial cells, microorganisms and some minor substances are also found in whole saliva.

Dental caries is a complex multifunctional disease, as multiple factors influence the initiation and progression of the disease. Among the factors that have been related to greater cariogenic activity are inadequate dental hygiene and care. Changes in salivary components are in connection with caries formation and it may be used for recognizing risk in patients and to maintain prevention. Antioxidants are present in all body fluids and tissues and protect against endogenously-formed free radicals.

Salivary antioxidants system consist of enzymatic (superoxide dismutase and peroxidase) and non enzymatic (uric acid) components. Vitamin C is able to scavenge free radical of both reactive oxygen group (super oxide and...
hydro peroxyl) and reactive nitrogen group (nitrogen dioxide and peroxynitrite). Vitamin C may be capable of regenerating other antioxidants like vitamin E therefore prevents oxidative damages.

The aim of the present study was to determine the correlation between salivary and serum vitamin C concentration of adults in correspondence to DMFT index.

**Materials and Methods:**
This study was approved by the Committee for Ethics in Research, Dental College, Nitte University, Karnataka, India. 12,500 healthy adult patients coming to the OPD of Department of Conservative Dentistry and Endodontics, A.B.Shetty Memorial Institute of Dental Sciences under the age group of 25-50 years between December 2010- June 2011 were randomly selected. The patients fulfilling the inclusion criteria were free from systemic or local disease which affects salivary secretions and their caries status was assessed according to World Health Organization “W.H.O. recommendations 1997” to calculate dental caries index. Patients with periodontal disease, hypertension, diabetes, radiotherapy, chemotherapy, systemic disease of the vital organs and history of long term medications were excluded from the study.

Out of these, 80 healthy adults were selected for the study and divided into groups as caries free consisting of 20 individuals and caries active group consisting of 60 individuals. The caries active group was further divided into three subgroups based on the DMFT score as follows, Group I (DMFT<3), Group II (DMFT<10) and Group III (DMFT>10), each group consisting of 20 individuals.

A detailed case history of the patient was recorded, informed consent read and duly signed by each patient. The smooth and occlusal surfaces of teeth were cleaned with soft bristle brush, dried and examined. DMFT score calculated.

**Collection of saliva:**
Collection of saliva was done in the noon time before food to maintain the uniformity of the composition. Unstimulated saliva was collected from a patient who is not involved in any masticatory function in the last two hours prior to saliva collection and is seated in an ordinary chair and not on any dental / operatory chair to avoid anxiety.

5ml of saliva was collected from the patient, centrifuged and the supernatant obtained was stored at 4°C for subsequent analysis.

**Collection of Serum:**
5ml venous blood was withdrawn from the patient, centrifuged and serum obtained was stored at 4°C for subsequent analysis.

**Estimation of Vitamin C by DiNitroPhenylHydrazine (DNPH) method**
Vitamin C or ascorbic acid being a good reducing agent can undergoes reversible conversion to its oxidised form dehydroascorbic acid. Both these forms couple with 2,4-dinitrophenyl hydrazine to yield an ozazone which gives yellow color with sulphuric acid. Copper in the dinitrophenyl hydrazine reagent acts as a catalyst, and the intensity of the colour is read at 520nm.

**Statistical Analysis:**
One-way ANOVA was used to correlate vitamin C level in saliva and serum and DMFT index. Results are presented as mean ± standard deviation value. 'p' value of 0.05 or less was considered significant.

**Result:**
The mean levels of vitamin C in saliva of control group was 1.24±0.24 and that of group I, II and III were 0.98±0.15, 0.85±0.30 and 0.72±0.15. 'P' value was statistically significant (P<0.05).

**Table 1: Correlation between salivary and serum vitamin C levels in caries free and caries active adults.**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Caries Free Group</th>
<th>Caries Active Group</th>
<th>'P' value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean±SD (µM/L)</td>
<td>Mean±SD (µM/L)</td>
<td>Mean±SD (µM/L)</td>
</tr>
<tr>
<td>Saliva</td>
<td>1.24±0.24</td>
<td>0.98±0.15</td>
<td>0.85±0.30</td>
</tr>
<tr>
<td>Serum</td>
<td>1.38±0.24</td>
<td>1.27±0.17</td>
<td>1.15±0.21</td>
</tr>
</tbody>
</table>

'p'<0.05 is statistically significant. Statistical comparisons were performed by one-way ANOVA. Data are expressed as mean±SD

**Keywords**: Vitamin C, Saliva, Serum, Dental caries

**Mithra N. Hegde**
The mean level of vitamin C in serum of control group was 1.380±0.247 and that of group I, II and III were 1.274±0.176, 1.154±0.212 and 1.086±0.224. 'P' value was statistically significant (P<0.05).

Discussion:
The rich variety of molecules present in the salivary secretions renders saliva an attractive possible source of disease biomarkers. Over the last few years salivary research workers have been developing salivary diagnostic tools to monitor both oral and systemic disease. Saliva has many apparent advantages over serum as a medium for clinical diagnosis. Recent reports have identified several potentially useful biomarkers in saliva. Salivary antioxidant system was found to reduce the susceptibility to dental caries. The specific role of antioxidants is to neutralize rampaging free radical and thus reducing its capacity to damage. They act as radical scavenger, hydrogen donor, electron donor, peroxide decomposer, singlet oxygen quencher, and synergist. Large numbers of free radicals are produced during the process of dental decay. The numbers of free radicals vary directly with the degree of activity of the caries.

Antioxidants might adversely affect the oxidative carbohydrate metabolism within dental plaque thereby reducing bacterial activity and growth and consequently dental caries severity. Vitamin C acts as a powerful water-soluble antioxidant. Furthermore, it inhibits lipid peroxidation by reduction of tocopheroxyl radical to tocopherol and so protects the cell membrane from external oxidants. Water soluble antioxidant nutrients (reduced vitamin C) are initially consumed, followed by lipid soluble antioxidants (alpha tocopherol) in quenching the free radicals. Also, it has been reported that vitamin C regenerates vitamin E by nonenzymic mechanism.

Vitamin C (ascorbic acid) is an essential nutrient that serves to maintain the integrity of teeth. A prolonged deficiency of vitamin C results in tooth loss. The relationship between the serum level of vitamin C and number of carious lesions in the mouth is poorly understood. The study suggests that saliva and serum vitamin C level decreases with increase in caries activity and is statistically significant. The result is in accordance with our previous study. Variation in serum vitamin C levels between the study groups is because the dietary vitamin C intake was not controlled in groups. The decrease in vitamin C levels between the control and study group may be related to its antioxidant property of neutralizing the free radicals.

Conclusion:
Vitamin C plays an important role in maintaining the integrity of the teeth and also as an non-enzymatic antioxidant defense system. From the study it is evident that serum and salivary vitamin C level decreases with increase in caries activity suggesting the powerful antioxidant property of vitamin C.
References:

EFFECTIVENESS OF TWIN THERAPEUTIC APPROACHES ON PAIN AND ANXIETY AMONG PATIENTS FOLLOWING CARDIAC SURGERY

Ramesh C.1, Gayathri Priya2, Jyothi K.3 & Eilean Victoria L.4

1Assistant Professor, 2Lecturer, Noor College of Nursing, Bengaluru, Karnataka, India
3Associate Professor, 4Associate Professor, Sri Ramachandra College of Nursing, Sri Ramachandra University, Porur, Chennai, India

Correspondence:
Ramesh C.
Assistant Professor, Noor College of Nursing, Bengaluru, Karnataka, India,
Mobile: +91-9880055512     E-Mail: rameshmsn08@yahoo.com

Abstract:
The study was conducted to assess the effectiveness of twin therapeutic approaches on pain and anxiety among patients following cardiac surgery. An evaluative approach with quasi experimental design was used for the study. 40 samples were selected by non probability convenience sampling technique. Intervention of Naadichudhi Pranayams and Instrumental music was given as twin therapeutic approaches for the samples in the study group. The present study was conducted in Sri Ramachandra Hospital, Chennai, India. The collected data were analyzed using descriptive and inferential statistics. A significant difference was found between pre test and post test in level of pain and anxiety (P<0.001). The study findings showed that the twin therapeutic approaches were very effective in reducing the pain and anxiety. There was no association found between level of pain and anxiety with demographic variables.

Keywords: Twin therapeutic approaches, Pain, Anxiety, Cardiac Surgery.

Introduction:
The heart starts beating from the fourth week of intra uterine life, the human heart beats 100,000 times a day and pumps 5 liters of blood throughout the body covering 60,000 miles of cardiovascular system to nourish the living tissue. Due to many risk factors, people are developing many cardio vascular diseases. Cardiovascular disease is the leading cause of morbidity and mortality in the developing and developed countries.

WHO (2002) estimated that 45 million patients of coronary artery disease are in India and one fifth of deaths has occurred due to coronary artery disease. By the year 2020, it will account for one third of all deaths.

In order to manage this dreadful disease, medical field has discovered many newer therapeutic measures keeping in pace with the modern technology. The advent of Cardio Pulmonary Bypass (CPB), availability of durable prosthetic cardiac valves, off-pump Coronary artery bypass graft (CABG) and the current trends in the surgical techniques guaranteed the improved quality of life following cardiac surgery.

Anxiety related to surgery and its outcome increases pain perception and the vise – versa. Pain can adversely affect the physiological as well as the psychological recovery following a surgery. Hence relief of pain and reduction of anxiety remain the major aspects of nursing practice.

Need for the study
Joachim (2006) reported that about 8,00,000 coronary bypass procedures are presently performed every year worldwide, and in India Kasliwal (2006) stated that 25,000 open heart surgeries are being performed every year. Even though there is a vast advance in surgical technique, the anxiety and post operative pain remains unavoidable.

Managing post operative pain continues to be one of the most complex and challenging task encountered by nurses. Nurses are available round the clock to the patients. Hence they are in an excellent position to make significant and...
unique contribution to the patient’s pain management. To 
attain post operative pain control, it is important to 
incorporate alternative methods of pain management 
besides administering the routine medication.

Nurses need empirically tested pain relieving methods 
that is simple and rapid in action. Relaxation techniques are 
found to decrease pain by reducing anxiety and muscle 
tension. Many investigations experimented the 
effectiveness of various relaxation techniques either single 
or in combination

The combination of music and jaw relaxation is more often 
tested than other combinations. In an attempt to provide 
nurses a comprehensive less time consuming relaxation 
technique, which is easily learned and easily taught, the 
investigator intended to try the twin therapeutic 
approaches combining pranayama and music

Statement of the Problem
A study to assess the effectiveness of twin therapeutic 
approaches on pain and anxiety among patients following 
cardiac surgery at Sri Ramachandra Hospital, Porur, 
Chennai

Objectives of the study
F Assess the level of pain and anxiety among patients 
following cardiac surgery
F Determine the effectiveness of twin therapeutic 
approaches on pain and anxiety among patients 
following cardiac surgery
F Associate the selected demographic variables with level 
of pain and anxiety among patients following cardiac 
surgery

Review of literature
An experimental study conducted to assess the effect of 
pranayama on patients following cardiac surgery in a 
cardiac care centre in Calcutta. A total of 100 samples were 
selected for the study, 50 in experimental and 50 in control 
group. The patients were explained about the pranayama 
prior to the surgery. After 48 hours of removal of ventilator, 
the patients were asked to perform pranayama for 10 
minutes. They identified the yoga breathing technique as a 
remarkable post surgery recovery with significant decrease 
in pain level among the experimental group than the 
control group

An evaluative research determined the effect of relaxation 
on pain among post operative cardiac patients in cardiac 
critical care unit, California. A total of 56 samples were 
selected for the study assigning 28 samples for each group, 
terventional and non interventional group respectively. 
Breathing technique was given as an intervention and 
found a significant decrease in pain level, heart rate and 
blood pressure in the interventional group than the non 
terventional group.

A quantitative study was conducted to assess the effects of 
music therapy on physiological and psychological 
outcomes among patients who underwent cardiac surgery 
in Northwestern hospital, USA. A total of 86 patients were 
selected for the study, assigning 43 samples in two groups. 
An audio taped instrumental music was given as an 
tervention for 20 minutes for the first group and other 
diversions for the second group. Results showed that there 
was a significant reduction in pain and anxiety level of 
patients in the first group than the second group.

Materials and Methods :
Research Design
Quasi experimental design was used for present study

\[ E \cdot O_1 \times O_2 \]

\[ C \cdot O_1 \quad O_2 \]

E - Experimental Group
O1 - Pre test
O2 - Post test
C - Control Group
X - Twin approaches consist of Pranayama and 
Instrumental Music

Research Setting
The study was conducted in the Cardiology Department at 
Sri Ramachandra Hospital, Porur, Chennai, which is a multi 
specialty Hospital with 2500 beds and accreted with JCAI
and NAAC (‘A’ Grade 3.52). The cardiology department consists of Medical and surgical cardiac critical care units, general wards with female and male sections and private wards with single and shared rooms. Cardiac critical care units have 40 beds in total, general wards have 65 beds in total, private wards have 20 single rooms and semi private wards have 20 rooms. Patients get admitted here for investigation and treatment.

**Population**

Population of the study were patients both male and female who underwent cardiac surgery in the department of cardio thoracic vascular surgery at Sri Ramachandra Hospital, Porur, Chennai.

**Sample, Sample Size and Sampling technique**

Sample of the study were patients both male and female who underwent cardiac surgery and who fulfilled the inclusion and exclusion criteria. The sample size was forty, the control and study group consists of 20 subjects in each group. Non probability convenience sampling technique was used to select the samples.

**Data Collection Tool**

Data collection tool were consisted of three parts

- **Part I – Demographic Variables**
- **Part II – Huskisson’s 1934 Numerical pain rating scale is otherwise called marked visual analogue**
- **Part III – Spielherger’s State Trait Anxiety Inventory (STAI)**

**Data Collection Process**

The investigator got prior oral consent from the subjects. Explanation of the procedure and its rationale was given to the subjects by providing privacy and restriction of visitors. Two days prior to the surgery subjects were selected and baseline state and trait anxiety was assessed. Then naadichudhi pranayama was taught and demonstrated to the subjects of the study group for two evenings prior to the surgery. Naadichudhi Pranayama and instrumental music was given as intervention for three consecutive post operative days from day three to day five. Each day the morning intervention was given one hour prior to administration of analgesics, then after 11 hours the evening intervention was given for the study group. The duration of intervention was for 25 minutes, five minutes of pranayama and 20 minutes of instrumental music. The investigator assessed the level of state anxiety on the third post operative day morning before the intervention, then on the fifth post operative day after the evening intervention the level of state anxiety was assessed. From the third post operative day till the fifth post operative day pre and post test level of pain was assessed in the morning and evening before and after the intervention. Performance of twin therapeutic approaches was guided and supervised by the investigator.

**Statistical Analysis**

Descriptive statistics (frequency, percentage, mean, standard deviation) and inferential statistics (paired t-test, independent t-test and chi-square) were used to analyze the data and to test the hypothesis.

**Results :**

- **F** Level of pain shows, in the study group 20 (100%) of them had moderate in the pre test and after the intervention all of them had mild pain in the post test.
- **F** In the control group, the level of pain was moderate 20 (100%) in both pre and post test.
- **F** The level of anxiety before the intervention shows that in the study group 20 (100%) of them had state anxiety and after intervention 18 (90%) of them had no anxiety and only 2 (10%) of them had anxiety.
- **F** In the control group, there was no change in level of anxiety in third post operative day as well on the fifth post operative day.
- **F** The naadichudhi pranayama and instrumental music were found to be effective. There was a significant reduction in pain and anxiety level at a 'P' level of <0.001 where as no reduction was found in the control group.
- **F** There was no significant association between demographic and clinical variables with the level of pain and anxiety in the study and control group.

**Keywords**: Twin therapeutic approaches, Pain, Anxiety, Cardiac Surgery. - Ramesh C.
Discussion:
The study findings were discussed based on the objectives as follows: The first objective of the study was to assess the level of pain and anxiety among patients following cardiac surgery. Interviewing technique was used to assess the level of pain and anxiety. Percentage distribution of level of pain among patients following cardiac surgery, revealed that in the study group 20 (100%) of them had moderate pain in the pre test, after the intervention all of them had mild pain in the post test. In the control group 20 (100%) of them had moderate level of pain in both pre and post test without the intervention.

The level of state anxiety among patients following cardiac surgery revealed that in the study group, pre operative day anxiety was present in 20 (100%) of them. On the V post operative day 18(90%) of them had no anxiety and only 2 (10%) of them had anxiety. In the control group the pre operative and post operative day anxiety level revealed equal distribution of presence of anxiety at 20 (100%).

The second objective of the study was to determine the effectiveness of twin therapeutic approaches on pain and anxiety among patients following cardiac surgery in the post test. The comparison of pain score among patients following cardiac surgery in the pre and post test within the study and control group revealed that in the study group, it was observed that the pain intensity scores showed a marked reduction of mean pain score on the all three days of intervention. The independent ‘t’ test value shown was very significant at P<0.001 on all three days of intervention. Whereas in control group minimal reduction of pain level was seen and it was statistically insignificant.

Third objective was to associate the selected demographic variables with level of pain and anxiety among patients following cardiac surgery. The association of level of anxiety between demographic and clinical variables reveals that in the study group there was no significant association between demographic and clinical variables with the level of anxiety.

Hypothesis:
There is a significant difference in pain and anxiety level among patients following cardiac surgery who receive twin approaches than who do not. The twin therapeutic approaches had effect in terms of reduction of pain and anxiety among post operative patients following cardiac surgery. Thus the stated hypothesis was accepted.

Conclusion:
Nurses predominantly play a vital role of primary care giver in hospital setting for patients subjected to major cardiac surgeries. The nurses are well aware of the pain and anxiety experienced by patients after major cardiac surgeries. Hence the nurses have to implement non pharmacological interventions as music and yoga in order to reduce the level of pain and anxiety and promote the comfort of the patient. Nurses working in the general surgical wards neuro wards, renal wards and cardio thoracic wards come across post operative patients with pain and anxiety more frequently. Soon after the analgesic effect weans off for all post operative patients with pain the nurses can install the music and yoga as adjuvant to medication which can be made accessible to patients through the twin therapeutic approaches.

Recommendations
F A similar study can be conducted as an experimental study with randomization.
F This study can be replicated on a larger scale.
F This study can be replicated on a specific gender.
F A comparative study can be conducted using pranayama and relaxation music.
F This study can be replicated with biophysiological parameters

The study can be done by maximizing time period of pranayama

Keywords: Twin therapeutic approaches, Pain, Anxiety, Cardiac Surgery. - Ramesh C.
Table 1: Effect of twin therapeutic approaches on pain among patients following cardiac surgery in study and control group (N=40).

<table>
<thead>
<tr>
<th>Post operative Day</th>
<th>Study group</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Day III Morning</td>
<td>27.00</td>
<td>4.70</td>
</tr>
<tr>
<td>Day III Evening</td>
<td>26.50</td>
<td>5.87</td>
</tr>
<tr>
<td>Day IV Morning</td>
<td>25.00</td>
<td>6.07</td>
</tr>
<tr>
<td>Day IV Evening</td>
<td>25.00</td>
<td>5.13</td>
</tr>
<tr>
<td>Day V Morning</td>
<td>23.50</td>
<td>4.89</td>
</tr>
<tr>
<td>Day V Evening</td>
<td>23.00</td>
<td>4.70</td>
</tr>
</tbody>
</table>

*** P< 0.001

This table reveals the effect of intervention on pain by comparing the study and control group. The mean score of pain reduction in the study group was 27.00 with standard deviation of 4.70 on the first day morning and in the evening the mean score was 26.50 with standard deviation of 18.35. The paired ‘t’ test proved that there is a statistically significant pain reduction at P<0.001 level whereas control group did not show any significant pain reduction. Similarly on the second day, the data revealed that there was a significant reduction as the mean in the study group was 25.0 with standard deviation of 6.07, paired ‘t’ test value was 18.420. On the same evening, the mean score for study group was 25.00 with standard deviation of 5.13 and paired t test value was 21.794 without any change in the control group.

Likewise on the third day, further reduction in pain was noticed as the mean score in the study group was 23.50 with standard deviation of 4.89 and paired ‘t’ test value was 21.476 and in the evening mean score was 23.00 with standard deviation of 4.70 and the paired ‘t’ test value was 21.87. In control group also very minimal decrease in the level of pain was seen in all three days of observations but it was statistically insignificant. This clearly indicates that the intervention has influenced the pain perception. The analysis of pain scores of control and study group applying paired ‘t’ test reveals a highly significant difference (P<0.001)

Keywords: Twin therapeutic approaches, Pain, Anxiety, Cardiac Surgery. - Ramesh C.
Table 2: Effect of twin approaches on anxiety among patients following cardiac surgery in the study and control group (N=40).

<table>
<thead>
<tr>
<th>Group</th>
<th>Test</th>
<th>State anxiety score</th>
<th>Difference between pre operative and Vth post operative day</th>
<th>Paired ‘t’ value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>S.D</td>
<td>Mean</td>
</tr>
<tr>
<td>Study group</td>
<td>Post operative day III before intervention</td>
<td>43.15</td>
<td>3.57</td>
<td>18.00</td>
</tr>
<tr>
<td></td>
<td>Vth post operative day after the intervention</td>
<td>30.50</td>
<td>2.61</td>
<td></td>
</tr>
<tr>
<td>Control group</td>
<td>Post operative day III before intervention</td>
<td>43.90</td>
<td>4.59</td>
<td>2.80</td>
</tr>
<tr>
<td></td>
<td>Vth post operative day after the intervention</td>
<td>42.10</td>
<td>3.95</td>
<td></td>
</tr>
</tbody>
</table>

***P<0.001

This table shows that there is significant reduction in state anxiety with mean score of 18.00 in the study group. It also shows that there is only slight reduction of state anxiety with a mean score of 2.80 in the control group. This table reveals that there is a statistically significant reduction of state anxiety ‘p’ level<0.001 in study group than the control group.

References:
12. Enas, K. J, Relative risk of hospitalization for CAD in India Vs other Asians and whites in the U.S.A. Indian heart journal, 1997; Vol 14(3), pp105-113

Keywords: Twin therapeutic approaches, Pain, Anxiety, Cardiac Surgery. - Ramesh C.
A STUDY TO ASSESS THE KNOWLEDGE AND ATTITUDE ON CHILD REARING PRACTICES AMONG FATHERS OF HOSPITALISED CHILDREN OF 1-6 YEARS OF AGE, IN KASTURBA HOSPITAL, MANIPAL

Sreeram A.1, D' Souza A2 & Margaret B. E.3
1M.Sc Student, 2,3Assistant Professors, Department of Child Health Nursing, Manipal College of Nursing, Manipal University, Karnataka, India

Correspondence:
Anjalin D’ Souza
Assistant Professor, Department of Child Health Nursing, Manipal College of Nursing, Manipal University, Karnataka, India
E-mail: anjeline.d@manipal.edu

Objective: To assess the knowledge and attitude on child rearing practices among fathers of hospitalised children of 1-6 years of age.

Materials and method: A descriptive correlational survey was done among conveniently selected 150 fathers of hospitalised children of 1-6 years of age at Kasturba Hospital, Manipal. The knowledge and attitude in childrearing practices were assessed using a demographic proforma, knowledge questionnaire and attitude scale.

Result: The findings showed that fathers’ had satisfactory knowledge and favourable attitude in childrearing practices. The study also revealed that there was a significant association between knowledge and type of family (p= 0.015) and that there was no significant association between attitude in childrearing practices and demographic variables.

Conclusion: The study concluded that there is no relationship between knowledge and attitude on child rearing practices among fathers and fathers’ had satisfactory knowledge and favourable attitude in childrearing practices.

Keywords: Knowledge, Attitude, Child rearing practices, Hospitalised children

Introduction:
The most important factor in a child’s healthy development is to have at least one strong relationship (attachment) with a caring adult who values the well-being of the child. A father is an involved father if his relationship with his child can be described as being sensitive, warm, close, friendly, supportive, intimate, nurturing, affectionate, encouraging, comforting, and accepting. In addition, fathers are classified as being involved if their child has developed a strong, secure attachment to them. The role of the father in child rearing is limited, whereas mothers assume primary responsibility for childcare duties. However, recent social and demographic changes as well as increasing full time employment of wives increase pressure for fathers to become more actively involved in child rearing.

Palkovitz (1997) broadened the conceptualization of childrearing with reference to 15 categories of paternal involvement that included: Communication (listening, talking, showing love); Teaching (role modeling, encouraging activities and interests); Monitoring (friends, homework); Cognitive processes (worrying, planning, praying); Errands; Caregiving, (feeding, bathing); Shared interests (reading together); Availability; Planning (activities, birthdays); Shared activities (shopping, playing together); Providing (food, clothing); Affection; Protection; and Supporting emotionality (encouraging the child).

A Korean based study by Jung (2000) explored the possible antecedents of paternal child rearing in middle-class, two-parent, Korean families by addressing the intergenerational similarities and differences in child...
rearing practices and attitudes. The study concluded with the finding that paternal job satisfaction ($p < 0.01$), and relationship with their own mother ($p < 0.001$), as well as paternal educational attainment ($p < 0.05$) predicted fathering behaviors with respect to child sexuality and parental rules ($p < 0.001$).  

A comparative study was conducted by Rodolfo in 2005 about parenting knowledge in a sample 70 married Brazilian couples in Rio De Janeiro. Snowball sampling technique was used to select the participants. Knowledge on infant development inventory was collected and a sociodemographic questionnaire was distributed and hierarchical regression analysis was used to know whether gender, education status predicted the knowledge scores. The study found out that the average knowledge scores in mothers was found to be significantly higher than that of father’s knowledge scores and that in mothers, the education $[F(1,69) = 15.13]$ and child’s age$[F(2,69)=3.92]$ predicted knowledge score, that is older mothers with more education and older children had higher knowledge scores but for fathers only education predicted knowledge score.

Although fathers became a topic of interest and research, few Indian studies have specifically examined fathers knowledge and attitude in child rearing. Understanding the parent-child relationship is fundamental to nursing of children and families. Fathers have a key role in the development of a child and their attitude and involvement in child rearing brings about sociopsychological changes in the child’s growing periods.

The investigator’s clinical and personal experience provided rich insight into the problem. Studies regarding paternal attitude in childrearing are studied less in Indian population. This study is undertaken since studies on paternal knowledge, attitude and perceived paternal involvement in childrearing are few in number.

The purpose of the study was to assess the knowledge and attitude of fathers in childrearing practices. The findings of the study would help to identify the ways to improve the role of the father in childrearing. Child rearing practices mainly include practices related to nutrition, health, milestone development, immunization, accidents, toilet training and the strategies to meet the physical, socio-economical and cognitive needs of children as they develop. The information gained will help the health care personnel in planning educational activities for the father in the future.

Materials and method:
A descriptive correlational survey was done among conveniently selected 150 fathers of hospitalised children of 1-6 years of age from the Paediatric out patient department and Paediatric medicine wards of Kasturba Hospital, Manipal.

A demographic proforma was used which had ten items that were divided into two sections namely; data related to the father such as age, religion, type of family, number of children, monthly income of family, education and occupation and data related to the child such as age, gender and birth order.

The knowledge questionnaire had thirty items under different areas of child rearing practices namely nutrition, health, milestone development, immunization, accidents and toilet training with four response options for each question and the correct response was assigned a score of one and the incorrect item was assigned a score of zero. According to the scores obtained, the fathers were categorized into having poor knowledge with scores between (1-10), satisfactory knowledge with scores between (11-20) and good knowledge with scores between (21-30).

The attitude rating scale had thirteen items with four responses to each item ranging from always, sometimes, rarely and never. According to the scores obtained, the fathers were categorized into having unfavourable attitude with scores between (13-25), moderately favourable attitude with scores between (26-38) and favourable attitude with scores between (39-52).

The tools were validated by seven experts. Reliability of...
Knowledge questionnaire was done by spilt half method and r value was 0.87, Attitude scale was done by cronbach’s alpha method and r value was 0.7. Hence the tools were found reliable.

After obtaining the ethical approval from the institutional ethical committee Kasturba Hospital, Manipal data was collected. The subject information sheet about the study and informed consent were given to the fathers. After obtaining informed consent, the four tools were administered. The fathers were asked to read the instructions of each tool and complete each item accordingly.

Results:
Sample Characteristics
The data was analysed based on the objectives and hypotheses of the study using descriptive and inferential statistics.

It was observed that majority 79 (52.7 %) of the fathers belonged to the age group of 30-36 years, majority 114 (76 %) of the fathers were Hindus, majority of the fathers 117 (78 %) belonged to nuclear family and majority 76 (50.7 %) of the fathers had only one child. Regarding the family income, majority 63 (42%) found income between Rs 7001-9000. The study results showed that majority 42 (28%) of the fathers had secondary level of education and majority of the fathers 50 (33.3%) were in the skilled group. It was also observed that the majority 97 (64.7%) of the children were between the age of 1-3 years, majority 90 (60%) of the children were girls whereas 60 (40%) were boys and majority 93 (62%) of the children established the first birth order. (Table No.1 & 2)

Description of Knowledge and attitude scores
The mean knowledge score on childrearing practices was 19.34 +/- 2.471 and the mean attitude score on childrearing practices was 40.99 +/- 2.955 (Table 3)

The study findings also revealed that majority 100 (66.1%) of the fathers had satisfactory knowledge in childrearing practices (figure1) and majority 116 (77.3%) of the fathers had favourable attitude on childrearing practices (figure 2)

Relationship between Knowledge and attitude
Pearson’s correlation coefficient was computed to find the relationship between knowledge and attitude in child rearing practices. It revealed that there was no relationship between knowledge and attitude in childrearing practices. (Table 4)

Association between Knowledge, attitude and selected demographic variables
It was found that there is significant association between knowledge and type of family (χ² = 5.973, p= 0.015). (Table 5)

The p-value obtained for the association between attitude and demographic variables is more than 0.05, there is no significant association between attitude in child rearing practices and selected demographic variables. (Table 6)

Discussion:
The present study shows that a majority 100 (66.1%) of the fathers had satisfactory knowledge in child rearing practices with a mean knowledge score on childrearing practices of 19.34 +/- 2.471. Similar to the present findings, a comparative study conducted by Rodolfo in 2005 about parenting knowledge in a sample 70 married brazilian couples in Rio De Janeiro found out that the average knowledge scores in mothers (M= 0.69, SD= 0.09) was found to be significantly higher than that of father’s knowledge scores (M= 0.64, SD= 0.09).^4

The present study findings showed that there is no association between attitude and demographic variables on childrearing practices. The present study findings are supported by a comparative study conducted by Lewis in 2000 to examine the sociodemographic characteristics and attitudes of primary care giving fathers and non-primary care giving fathers and the quality of their interaction with their infants. It was observed that the primary care giving fathers had lower occupational status and earned a smaller proportion of the family income but did not differ in educational level or attitudes compared with non primary care giving fathers.^5

Keywords: Knowledge, Attitude, Child rearing practices, Hospitalised children - Anjalin D’ Souza
The present study shows that there is no association between attitude and educational level of the father. This finding is contraindicated in a Korean-based survey by Jung explored the possible antecedents of paternal child rearing in middle-class, two-parent, Korean families by addressing the intergenerational similarities and differences in child rearing practices and attitudes. The study concluded with the finding that paternal job satisfaction ($p < 0.01$), and relationship with their own mother ($p < 0.001$), as well as paternal educational attainment ($p < 0.05$) predicted fathering behaviors with respect to child sexuality and parental rules ($p < 0.001$).

Conclusion:

The present study shows that majority of the fathers had satisfactory knowledge in childrearing practices and had favourable attitude in childrearing practices. From this study it can be inferred that there is no relationship between knowledge and attitude of fathers on child rearing. The study also shows that there is significant association between knowledge and type of family, thus it can be interpreted that knowledge is dependent on type of family and independent of other variables.

Acknowledgement:

I extend my gratitude to Dr. Anice George, Dean, Manipal College of Nursing for providing an opportunity to undertake the study and for her valuable ideas and suggestions in the initial part of my study.

My heartfelt gratitude to Dr. Baby S. Nayak, HOD, Department of Child Health Nursing, Manipal College of Nursing for her valuable guidance and concern during the entire period of my study.

Table 1: Demographic characteristics of fathers of hospitalized children (n=150)

<table>
<thead>
<tr>
<th>Demographic variable</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage (%)</th>
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</thead>
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<tr>
<td>Age (in years)</td>
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<td>30-35</td>
<td>79</td>
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<tr>
<td></td>
<td>36-42</td>
<td>32</td>
<td>21.3</td>
</tr>
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<td>Hindu</td>
<td>114</td>
<td>76</td>
</tr>
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<td>Muslim</td>
<td>20</td>
<td>13.3</td>
</tr>
<tr>
<td></td>
<td>Christian</td>
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<td>10.7</td>
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<td>78</td>
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<td>22</td>
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<tr>
<td></td>
<td>Joint</td>
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<td>22</td>
</tr>
<tr>
<td>Number of children</td>
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<td>Three</td>
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<td>7001-9000</td>
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Table 2: Demographic characteristics of children (n=150)

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<th>Demographic variable</th>
<th>Category</th>
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<tr>
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<td>62</td>
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<td>33.3</td>
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<td>Third</td>
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Table 3: Mean, Median, Standard deviation of knowledge, attitude and involvement score (n=150)

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<th>Median</th>
<th>Standard deviation</th>
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<td>19.00</td>
<td>2.471</td>
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<tr>
<td>Attitude</td>
<td>40.99</td>
<td>41.00</td>
<td>2.955</td>
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Table 4: Correlation between knowledge and attitude in child rearing practices (n=150)

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<th>Variable</th>
<th>Correlation coefficient(r)</th>
<th>p-value</th>
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<td>Knowledge</td>
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Table 5: Association between knowledge in child rearing practices and selected demographic variables. 

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<tr>
<td>24-29</td>
<td>19</td>
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<tr>
<td>30-35</td>
<td>42</td>
<td>37</td>
<td>1.391</td>
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<tr>
<td>36-42</td>
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*significant

Figure 1: Pie diagram showing father's knowledge on child rearing practices. N=150

Table 6: Association between attitude in child rearing practices and selected demographic variables.

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<tr>
<th>Demographic variables</th>
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<th>p-value</th>
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<tr>
<td>Age of the child</td>
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Figure 2: Pie diagram showing father's attitude on child rearing practices. N=150

References:
EVALUATION OF RENAL PROTECTIVE ACTIVITY OF ADHATODA ZEYLANICA (MEDIC) LEAVES EXTRACT IN WISTAR RATS

Arunachalam Kumar¹, Suchetha Kumari N.², Prima D'Souza³ & Divya Bhargavan⁴
¹Professor of Anatomy, ²Professor of Biochemistry, ³, ⁴Lecturers
K.S. Hegde Medical Academy, Nitte University Center for Science Education & Research (NUCSER), Mangalore - 575 018, India.

Correspondence
Arunachalam Kumar
Head, Department of Anatomy, Director (R&D) Nitte University
K. S. Hegde Medical Academy, Mangalore - 575 018, India.
E-mail : directorrd@nitte.edu.in, editornujhs@nitte.edu.in

Gentamicin is a potent broad spectrum antibiotic therapeutic agent used in a number of infective conditions. Because of the obvious mediation of Reactive Oxygen Species in Gentamicin induced renal damage. Several antioxidant agents have been used to block Gentamicin nephrotoxicity.

There is a proven converse relationship between the consumption of antioxidant rich plants incidence of human diseases. A primary goal of this study is to present the scientific evidence for the use of common herb Adhatoda zeylanica as supplementary in the gentamicin treated acute renal failure (ARF) subjects. The beneficial effect of A. Zeylanica against gentamicin nephrotoxicity, possibly depends on its ability to scavenge the gentamicin induced free radicals.

This study demonstrates the effectiveness of the extract improved with the polarity of the solvents over a period of 10 days and the plant has the potential to ameliorate Gentamicin nephrotoxicity.

Keywords: nephrotoxicity, Adhatoda zeylanica, gentamicin, free radicals, histopathology

Abstract:
The kidney is especially a susceptible organ to toxic injuries by drugs and toxin, because of a high blood supply and the presence of cellular transport systems that cause accumulation of these compounds within the nephron epithelial cells. Glomerular, tubular and interstitial cells frequently encounter significant concentrations of medications and their metabolites, which can induce changes in kidney function and structure. Renal toxicity can be a result of hemodynamic changes, direct injury to cells and tissue, inflammatory tissue injury and/or obstruction of renal excretion.

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Introduction:
The kidney is an essential organ that plays a dominant role in homeostasis by excreting the metabolic waste products and excess necessary substances. It conserves necessary products depending on the needs of the body [1]. It is especially susceptible organ to toxic injuries because of high blood supply and presence of cellular transport systems that causes accumulation of these compounds within the nephron epithelial cells [2]. Kidney disease is one of the commonest causes of hospitalization. Acute renal failures are common and serious problems having high morbidity and mortality rate [3]. Renal failure is a common clinical syndrome. It is defined as a rapid decline in renal function resulting in abnormal retention of serum creatinine and blood urea which must be excreted. The clinical manifestations of renal failure are the decline in glomerular filtration rate (GFR) and the inability of the kidney to excrete the toxic metabolic substances produced in the body. Effects on the kidney related to medications are, both common and expected, given the kidney’s roles in plasma filtration and maintenance of metabolic homeostasis. The renal vascular bed is exposed to a quarter of resting cardiac output. As such glomerular, tubular and interstitial cells frequently encounter significant
concentrations of medications and their metabolites, which can induce changes in kidney function and structure. Renal toxicity can be a result of hemodynamic changes, direct injury to cells and tissue, inflammatory tissue injury and/or obstruction of renal excretion. Markers of early injury are been investigated [4].

The toxicity of Gentamicin, a broad spectrum antibiotic, is believed to relate to generation of reactive oxygen species (ROS) in kidneys. Several reports have been documented the pathogenesis of aminoglycosides-induced renal tubular cell injury such as derangement of lysosomal, mitochondrial and plasma membrane structure. Furthermore results of many studies have been shown that the altered concentrations of various biochemical indicators of oxidative stress in kidney tissue are due to Gentamicin. Because of the obvious mediation of ROS in Gentamicin induced renal damage. Several antioxidant agents have been used to block Gentamicin nephrotoxicity [5, 6, 7].

Medicinal plants are commonly used in treating or preventing specific ailments or diseases and are considered to play a beneficial role in health care. Therefore, the study of plants as a resource of medicine has become more important in the context of present global trade scenario where oxidative stress is found to be one of the major causes of health hazards. India is considered as a treasure house of valuable medicinal and aromatic plant species.

Free radicals are highly reactive substances formed in the body as a result of metabolic processes. Many of these molecular species are oxygen (and sometimes nitrogen) centered free radicals and its non radical products. The term “reactive oxygen species” (ROS) collectively denotes oxygen centered radicals (super oxide and hydroxyl radicals) as well as non-radical species derived from oxygen such as hydrogen peroxide (H₂O₂), singlet oxygen (O₂) and hypochlorous (HOCl) acid [9]. The increased production of ROS seems to accompany most forms of tissue injury. Free radicals can also react with DNA, proteins or lipids in the cell membrane and cause damage [10]. The involvement of ROS in aging and in many chronic diseases has been considered. The defense provided by antioxidant systems is crucial for the survival of organisms. Detoxification of ROS in the cell is provided by both enzymatic and non enzymatic systems which constitute the antioxidant defense systems. These antioxidants play a role in delaying, intercepting, or preventing oxidative reactions catalyzed by free radicals.

Many plants contain antioxidant compounds and these compounds protect cells against the damaging effects of reactive oxygen species (ROS) such as singlet oxygen, superoxide, peroxyl radicals, hydroxyl radicals and peroxynitrite. Thus compounds or antioxidants that can scavenge free radicals have vital role in improvement of diseased conditions [11]. Medicinal, herbal and aromatic plants constitute a large segment of the flora, which provide raw materials for use by pharmaceutical, cosmetic, fragrance and flavour industries.

Several studies have demonstrated a converse relationship between the consumption of antioxidant rich plants or vegetables and the incidence of human diseases. There is emerging evidence in the literature about renoprotective complementary and alternative medicines. A primary goal of this study is to present the scientific evidence for the use of herb Adhatoda zeylanica as a complementary treatment for acute renal failure (ARF).

Adhatoda zeylanica is found throughout India up to an altitude of 1300 m. It is a Perennial, evergreen shrub, 1.2 – 2.5 m high. The leaves leathery and lower are white with red or yellow barred throats, in spikes with large bracts. Capsules are clavate, longitudinally channeled, 1.9 - 2.2 cm long. Seeds are globular.

The plant’s root, leaf, flower, fruit are used for therapeutically. A. zeylanica has been frequently used for the treatment of respiratory complaints and for cough, asthma and colds [12]. It is used as an expectorant, bronchodilator and to liquefy sputum [13, 14, 15, 16, 17]. A. zeylanica as an expectorant and antispasmodic agent was described and an alkaloid with a bitter taste was identified and named vasicine [18,19]. The macerated
roots of the Vasak (A. zeylanica) are applied on the pubic region and the vagina to help parturition [20, 21] stated the use of the whole plant of A. zeylanica for treating impotence and sexual disorders. The use of A. zeylanica leaves for checking postpartum haemorrhage in intermittent, typhus fevers, febrifuge and diphtheria has been reported. [22]. It is also used for stomach catarrh with constipation, rheumatism, gout, and urinary stone [23]. Leaf powder boiled in sesame oil is used to stop bleeding, ear aches, and pus from ears [24]. Root decoction is used for gonorrhoea [25]. Water extract of leaf is used to relieve acidity [26]. Leaf is used for urinary trouble.

Arun Yadav et al [27] studied anticestodal efficacy of Adhatoda vasica leaf extract using Hymenolepis diminuta-rat experimental model. The result indicated that 800mg/kg double dose of extract has profound efficacy against mature worms. The study showed that the leaf extract of possesses significant anticestodal efficacy and supports its use in the folk medicine.

Meenal Kumar et al [28] have reported that the modulator effect of ethanolic extract of A. vasica (L) Nees against radiation-induced alterations in terms of histological alterations in testis, reduced glutathione (GSH), lipid peroxidation (LPO), acid and alkaline phosphatases levels, and chromosomal alterations in Swiss albino mice was studied at various post-irradiation intervals between 1 and 30 days. When ethanolic leaf extract of A. vasica was given orally at a dose of 800 mg kg⁻¹ body weight per mouse for 15 consecutive days and then exposed to radiation, death of Adhatoda-pretreated irradiated mice was reduced to 70% at 30 days. The study suggested that Adhatoda plant extract has significant radioprotective effects on testis that warrants further mechanistic studies aimed at identifying the role of major ingredients in the extract.

Avula et al [29] developed a new method of capillary electrophoresis for the quantitative determination of vasicine and vasicinone from Adhatoda vasica (L.) Nees. The electrophoretic separation was performed using fused silica capillary. The samples were injected by pressure for 3s at 50 mbar and the running voltage was 19 kV at the injector end of the capillary. The capillary temperature was maintained at 40° C. The separation of the two alkaloids has been achieved within 11 min with good repeatability. The method was validated in terms of reproducibility, linearity, accuracy and applied for the quantitative determination of vasicine and vasicinone in A. vasica plant samples/extracts. Parameters affecting the resolution such as pH, temperature, organic modifier, buffer concentration and capillary dimensions were reported.

Kumar et al [30] studied the radiomodulatory influence of ethanolic extract of Adhatoda vasica Nees leaf extract against radiation-induced hematological alterations in peripheral blood of Swiss albino mice was studied at various post-irradiation intervals between 6 h to 30 days. Oral administration of A. vasica leaf extract (800 mg/kg body weight) prior to whole body irradiation showed a significant protection in terms of survival percentage and hematological parameters. Animals pre-treated with A. vasica leaf extract showed 81.25% survival till 30 days after exposure and a gradual recovery was noted in the hematological values. A significant decrease in blood reduced glutathione (GSH) content and increase in lipid peroxidation (LPO) level was observed in control animals (Radiation alone). However, A. vasica leaf extract pretreated irradiated animals exhibited a significant increase in GSH content and decrease in LPO level. A significant increase in the serum alkaline phosphatase activity and decrease in acid phosphatase activity was observed in A.vasica leaf extract pretreated irradiated animals during the entire period of study.

Vinothapooshan et al [31] made a study on methanolic, chloroform, and diethyl ether extracts of leaves of Adhatoda vasica at the dose of 200mg/kg body weight per oral and studied for the hepatoprotective effect using Carbontetrachloride induced liver damage in wistar albino rats. Methanolic extract showed significant (p<0.05) hepatoprotective effect. The experimental results suggests that the biologically active phytoconstituents such as Alkaloids- Quinazoline, Flavonoids, Tannins, Vasicinone, Essential oil present in the various extracts of Adhatoda.
vasica plant may be responsible for the significant hepatoprotective activity and the results justify the use of Adhatoda vasica as a hepatoprotective agent.

Shirish et al [32] carried out a work to investigate the potential hepatoprotective action of Adhatoda vasica whole plant powder against CCl4 induced liver damaged Wister rat model. Blood and tissue biochemical parameters of liver were examined for evaluating the hepatoprotection action. These biochemical markers are GOT, GPT, Alkaline phosphate, glucose, bilirubin, Triglycerides, ?GT, cholesterol, DNA, RNA, total protein etc. The effect of Adhatoda vasica whole plant powder is compared with Silymarin by standard protocol and is found to have better hepatoprotective action, thus Adhatoda vasica indicating protection in liver may prove promising effect against liver disorders. Thus it may act even in humans as a potent liver tonic.

Gentamicin nephrotoxicity
Wellwood et al [33] carried out a study to see the effect of Gentamicin on kidneys. Gentamicin was administered to male Wistar rats by intramuscular injection at varying dosage and for varying periods. At dosages equivalent to that given to man (5 mg/kg/day) obvious degenerative changes are produced. Proximal tubular, epithelial cell damage varied from cytoplasmic inclusion of lipid and laminated bodies at low dosage to tubular necrosis at high dosage (50-100 mg/kg/day), there is increased excretion of urinary enzymes proportional to the degree of tubular damage.

Moir et al [34] did a study to see the effect of Gentamicin on kidneys. Gentamicin was administered to male Wistar rats by intramuscular injection at varying dosage and for varying periods. At dosages equivalent to that given to man (5 mg/kg/day) obvious degenerative changes are produced. Proximal tubular, epithelial cell damage varied from cytoplasmic inclusion of lipid and laminated bodies at low dosage to tubular necrosis at high dosage (50-100 mg/kg/day), there is increased excretion of urinary enzymes proportional to the degree of tubular damage.

Porter GA et al [35] reported a study done on Gentamicin induced Nephrotoxicity. The autoradiography of micro-dissected isolated nephrons, showed that Gentamicin distributes almost exclusively in the proximal tubule, where an increasing concentration gradient takes place from the initial to the distal part. On isopycnic centrifugation of homogenates from isolated tubules, the drug is found exclusively associated with the lysosomes 6 hours after injection. At a shorter time, the distribution is slightly bimodal and consistent with an association of part of the drug with brush border. This agrees with the suggestion that Gentamicin enters cells and accumulates in lysosomes by absorptive pinocytosis. In Gentamicin-treated animals, it showed (1) a decrease of the latency of lysosomes; (2) a decrease of the activity of lysosomal sphingomyelinase and, at large doses, of cathepsin B and a-D-galactosidase; (3) a decrease of the activity of alanylaminopeptidase and y-glutamyl-transpeptidase. Unlike the others, the latter effect is not dose-related. All these alterations showed complete reversibility within 15 to 21 days after gentamicin withdrawal. These findings are consistent with the proposal that a central feature of the mechanism of Gentamicin nephrotoxicity involves the accumulation of the drug in the lysosomes of the cells of the proximal tubule, leading to an extensive dysfunction of these cells. From in vitro studies on cultured cells (fibroblasts), these alterations of the cell metabolism seem to be relevant for cell necrosis and cell death.

Pramila Padmini et al [36] have performed combined in vivo and in vitro measurements of thymidine uptake into kidney cortex DNA of animals treated with Gentamicin for 7 days at 10 or 20 mg/kg daily (BID). Labelled thymidine was taken up by cortex fragments in vitro (90 min incubation) and incorporated into DNA; treatment of the animals with Gentamicin results in a significant dose-dependent enhancement of this in vitro thymidine incorporation; labeled cells were found primarily in the proximal tubules and interstitium; there is an excellent correlation (r : 0.983, n = 15) between the changes of incorporation measured in vivo and in vitro as demonstrated by the sequential use of [3H] thymidine (in vivo) and [14C] thymidine (in vitro).
Pratibha Singh et al. [37] study said that Drug-induced nephrotoxicity is an important cause of renal failure. Aminoglycosides throughout the endocytic pathway are taken up into the epithelial cells of the renal proximal tubules and stay there for a long time, which leads to nephrotoxicity. Tubular epithelial necrosis and dilatation was observed affecting less than half of cortical tubules when rats treated with 60mg/kg b.w. Hyaline cast formation was observed in PCT with atrophic glomeruli effecting half of the cortical region when rats treated with 80mg/kg b.w. Gentamicin must be given in the lowest effective therapeutic doses in patients with normal kidney function.

Laxmi et al. [38] aimed at evaluating the ethanolic and aqueous extracts of root of Bauhinia variegata Linn. for antioxidant and nephroprotective effect in Gentamicin-induced nephrotoxicity in rats. The antioxidant activity of both ethanolic and aqueous extracts of root of Bauhinia variegata Linn was carried out. Nephrotoxicity was induced in Wistar rats by intraperitoneal administration of gentamicin 100 mg/kg/day for eight days. Ethanolic and aqueous extracts of the root of Bauhinia variegata Linn. At dose of 200 and 400 mg/kg b.w. were concurrently given by oral route. Serum creatinine, serum urea, urine creatinine and blood urea nitrogen (BUN) were determined on day 9. Histopathological study of kidney was also done. Both ethanolic and aqueous root extracts of Bauhinia variegata Linn. produced significant free radical scavenging activity. Both the extracts produced significant nephroprotective activity in Gentamicin induced nephrotoxicity model as evident by decrease in elevated serum creatinine, serum urea, urine creatinine and BUN levels, which was further confirmed by histopathological study. Gentamicin induced glomerular congestion, blood vessel congestion, and epithelial desquamation, accumulation of inflammatory cells and necrosis of the kidney cells were found to be reduced in the groups receiving the root extract of Bauhinia variegata Linn., along with Gentamicin.

Rama Saha et al. [39] made a study to evaluate the effect of ethyl acetate extract of fresh rhizomes of Zingiber officinale and dried fresh juice of fresh rhizomes for its protective effect on Gentamicin induced nephrotoxicity in rats. Nephrotoxicity was induced in wistar rats by intraperitoneal administration of Gentamicin 100mg/kg for eight days. Effect of concurrent administration of ethyl acetate extract and fresh juice extract of Zingiber officinale at a dose od 200 mg/kg given by oral route was determined using serum creatinine, serum uric acid, blood urea nitrogen and serum urea as indicators of kidney damage. The study groups contained six rats in each group. It was observed that the ethyl acetate and fresh juice extract of Zinger officinale significantly protect rat kidneys from Gentamicin-induced histopathological changes.

Okokon J et al. [40] had done a study to observe the toxic effect of gentamicin on epithelial cells of proximal convoluted tubule in Long Evans rats. Eighteen mature long Evans rats were divided into three groups A, B & C. The rats of group A were treated with vehicle and group B and C were treated with gentamicin 50gm and 100gm respectively. Blood urea and serum creatinine were measured and microscopic damaged cells were counted. There was significant increase in serum creatinin and blood urea in gentamicin treated groups. Microscopic examination of kidney showed necrosis of proximal tubular cells. It can be concluded from this study that gentamicin has toxic effects on renal tubule.

Hussain T et al. [41] had done a study to evaluate the protective effect of ethanolic root extract of Croton zambesicus (C. zambesicus) against gentamicin-induced kidney injury in rats. The root extract (27-81 mg/kg) was administered to rats for eight days with concurrent administration of gentimicin (100 mg/kg) daily for the same period of time. Protective effect of the extract was evaluated in serum levels of creatinine, urea, and uric acid as well as some ions like sodium, potassium and chloride. Histological examination of the kidneys from different treatment groups were also carried out. Administration of the root extract significantly reduced histopathological changes in the kidneys of the extract-treated rats especially within the same animals.
in the rats treated with lower doses of the extract (27 and 54 mg/kg). The levels of serum urea and creatinine were also reduced significantly (P<0.01) at these doses with no observable effect on the levels of uric acid and ions. The kidney-protective activity of this extract could be due to its antioxidant and free radical scavenging activities.[41]

Materials and methods:

Extract: The leaves of Adhatoda zeylanica were collected during the month of September from Mangalore region, cleaned and coarsely powdered and used for the extraction purpose. 80 gms. of powdered material was evenly packed and thimble was prepared and extraction was carried out with ethanol (60-80 °C), for 72 h using a Soxlet apparatus. After extraction, the defatted extract was filtered through Whatmann filter paper (No. 10) to remove insoluble particles. The extract was evaporated using rotary evaporator until all solvent was removed. Dark greenish coloured extract was obtained.

Antioxidant Activity; DPPH radical scavenging assay: Antioxidants react with DPPH, a stable free radical which is reduced to DPPH-H and as a consequence the absorbance is decreased from the DPPH radical to the DPPH-H form. The degree of discoloration indicates the scavenging potential of the antioxidant compounds or extracts in terms of hydrogen donating ability.

The free radical scavenging capacity of the Adathoda zeylanica leaves ethanolic extract was determined using DPPH according to the method of Blois.[42] DPPH solution (0.004% w/v) was prepared freshly in 99% ethanol and was added to sample solutions 100µg/ml in ethanol. The mixture was allowed to stand at room temperature in dark for 20 mins. Then the mixture was vortexed and the absorbance was read at 517nm using a spectrophotometer. Ellagic acid was used as a reference standard. Control sample was prepared containing the same volume without any extract and 99% ethanol was used as blank. Lower absorbance of the reaction mixture indicated higher free radical scavenging activity. All tests were performed in duplicates. Ellagic acid, a classical OH scavenger, was used as a positive control. Lower absorbance of the reaction mixture indicated higher OH radical scavenging activity. Percentage inhibition was evaluated by comparing the test and blank solutions. Percentage scavenging of the OH radical was measured using the following equation, OH radical scavenging activity (%) = (Acontrol-ATest)/Acontrol X 100.

Hydroxyl radical scavenging assay: This assay, as described by Elizabeth and Rao [43] was used with a slight modification. The assay is based on quantification of the degradation product of 2-deoxyribose by condensation with TBA. Hydroxyl radical was generated by the Fe²⁺-ascorbate-EDTA- H₂O₂ system (the Fenton reaction). The reaction mixture contained, in a final volume of 1 ml, 2-deoxy-2-ribose (2.8 mM); KH₂PO₄-KOH buffer (20 mM, pH 7.4); FeCl₃ (100 µM); EDTA (100 µM); H₂O₂(1.0 mM); ascorbic acid (100 µM) and various concentrations (0–200 µg/ml) of the test sample or reference compound. After incubation for 1 h at 37°C, 0.5 ml of the reaction mixture was added to 1 ml 2.8% TCA, then 1 ml 1% aqueous TBA was added and the mixture was incubated at 90°C for 15 min to develop the color. After cooling, the absorbance was measured at 532 nm against an appropriate blank solution. Reaction mixture without test substances/extracts was used as control. All tests were performed in duplicates. Ellagic acid, a classical OH scavenger, was used as a positive control. Lower absorbance of the reaction mixture indicated higher OH radical scavenging activity. Percentage inhibition was evaluated by comparing the test and blank solutions. Percentage scavenging of the OH radical was measured using the following equation, OH radical scavenging activity (%) = (Acontrol-ATest)/Acontrol X 100. Where Acontrol is the absorbance of the control reaction and A test is the absorbance in the presence of the sample of the extracts.

Reducing power (FRAP) assay: The Fe²⁺-reducing power of the extract was determined by the method of Oyaizu [44] with a slight modification. Different concentrations (0 - 400µg/ml) of the extract (0.5ml) were mixed with 0.5 ml phosphate buffer (0.2 M, pH6.6) and 0.5 ml potassium hexacyanoferrate (1%), followed by incubation at 50°C in a water bath for 20 min. After incubation, 0.5 ml of TCA (10%) was added to terminate the reaction. The upper portion of
the solution (1ml) was mixed with 1 ml distilled water, and 0.1 ml FeCl₃ solution (0.1%) was added. The reaction mixture was left for 10 min at room temperature and the absorbance was measured at 700 nm against an appropriate blank solution. All tests were performed in duplicates. A higher absorbance of the reaction mixture indicated greater reducing power. Ellagic acid was used as a positive control.

**Experimental Animal:** Albino rats (Wistar strain) of either sex (150-200gms) and of approximately the same age and weight were procured from KSHEMA Animal House were used for the study. They were kept in animal caging system and provided with standard animal feed pellets and water ad libitum. Animals were randomly selected for different experimental groups and used for the in vivo determination of nephroprotective activity. All experiments were performed according to the norms of the ethical committee.

**Acute toxicity studies:** Acute toxicity studies for ethanolic extracts of Adathoda zeylanica was conducted as per OECD guidelines 423 using albino Wistar rats. Each animal was administered the extract by oral route at the doses from 100 to 5000mg/kg. The animals were observed for any changes continuously for the first 2h and up to 24 h for mortality.

**Evaluation of nephroprotective activity in Gentamicin induced nephrotoxicity:** Experimental animals were distributed randomly, in three groups, containing six animals each.

**Group I** - Animals were administered with equivalent volumes of 0.1 ml i.p of normal saline (0.9% w/v NaCl) for 8 days.

**Group II** - Animals received 80mg/kg body weight Gentamicin intraperitoneally for 8 days to induce nephrotoxicity.

**Group III** - Animals were received 80 mg/kg body weight of Gentamicin intraperitoneally for 8 days to induce Nephrotoxicity and 500 mg/kg, of ethanolic leaf extract Adathoda zeylanica was given respectively to the animals from 9th to 18th day of study.

**Sample Collection:** Individual rats belonging to different groups were placed in metabolic cages over a period of 24 h and urine was collected. At the end of the experiment, i.e. 24 hours after the last dose rats were anesthetized with chloroform. Blood samples were collected by cardiac puncture in plain plastic tubes, left to stand at for 1 hour, and centrifuged (900 × g for 15 mins) to separate serum. The serum obtained was stored at -5°C until analysis.

**Biochemical Analysis:** Serum was analyzed for creatinine, urea and total protein using Agappe diagnostic kits.

**Parameters assessed for renal function:**
1) **Body weight:** The weight (in grams) of the animals was noted on the first and last day of treatment.
2) **Serum urea:** Urea concentration in urine was estimated by Modified Berthelot methodology.
3) **Serum creatinine:** Creatinine level in serum was estimated by Modified Jaffe’s method.
4) **Serum protein:** Total protein in serum was estimated by Direct Biuret method.

**Histopathological studies:** After blood sampling for the biochemical analysis, the animals were sacrificed quickly, dissected and small slices of kidney will be taken and fixed in 10% formalin. The specimens are dehydrated in ascending grades of ethanol, cleared in xylene and embedded in paraffin wax. Sections of 6µm in thickness are prepared and stained with Haematoxylin and Eosin then examined under microscopy.

**Results:**

**Antioxidant property:** DPPH radical scavenging assay: DPPH test provides simplified version to detect the antioxidant properties of various molecules present in the extracts. A DPPH solution is decolorized when the odd electron becomes paired off in the presence of a free radical scavenger. The color becomes light yellow from deep violet. The results of the assay are given in the table 1. The percentage of radical scavenging property of the
extract and standard in this assay were 42.08±1.11% and 93.70±0.70% at 100µg/ml respectively.

**Hydroxyl radical scavenging assay:** This assay shows the abilities of the extract and standard Ellagic acid to inhibit hydroxyl radical-mediated deoxyribose degradation in a $\text{Fe}^{3+}$-EDTA-ascorbic acid and $\text{H}_2\text{O}_2$ reaction mixture. The results are shown in table 1. The percentage of radical scavenging property of the extract and standard in this assay were 32.25±1.82% and 88.79±0.70% at 200µg/ml respectively.

**Reducing power assay:** The extract showed potent antioxidant power by reducing power ability. The EC$_{50}$ value of the extract and standard were found to be 775.66±0.67µg/ml and 104.88±0.92µg/ml respectively. Results of reducing power assay are shown in Table 1..

**Table 1:** Comparison of radical scavenging property and reducing property of Adathoda zeylanica leaves ethanolic extract with Ellagic Acid

<table>
<thead>
<tr>
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<th>DPPH radical scavenging capacity</th>
<th>OH radical scavenging capacity</th>
<th>FRAP Assay</th>
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<tr>
<td></td>
<td>% of radical scavenging property/100µg of extract</td>
<td>% of radical scavenging property/200µg of extract</td>
<td>EC$_{50}$ conc.µg/ml</td>
</tr>
<tr>
<td>A.zeylanica Extract</td>
<td>42.08±1.11%</td>
<td>32.25±1.82%</td>
<td>775.66±0.67</td>
</tr>
<tr>
<td>Ellagic Acid</td>
<td>93.70± 0.70%</td>
<td>88.79±0.70%</td>
<td>104.88±0.92</td>
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P<0.05 is statistically significant. Data are expressed as Mean±SD.

All three methods to estimate Antioxidant activity of the ethanolic extracts of leaves of Adhatoda zeylanica have proven the effectiveness compared to the reference standard ellagic acid.

**Toxicity studies:**
The ethanolic leaf extract of Adathoda zeylanica when orally given to the rats at doses from1000 to 5000mg/kg showed no mortality or any adverse signs with regard to body weight, body temperature, and food and water uptake during the first 2h and no mortality was observed till 24hr. Extract was safe up to a maximum dose of 5000mg/kg b.w. the dosage for further pharmacological study was fixed at 250 mg/kg b.w by oral route.

**Change in body weight:** Gentamicin treated animals (Group II) showed a decrease in body weight compared to control rats (Group I). There was an increase in body weight of animals treated with Ethanolic extract of Adathoda zeylanica respectively, when compared with Group II.

**Effect of test drug on Gentamicin induced nephrotoxicity**

**Serum urea:** Serum urea in the control group was estimated to be 30 ± 2. 302 mg/dl. In the negative control group treated with Gentamicin only at the dose of 80mg/kg, it was 140.267 ± 8.214. In the post-treated group in which animals received Gentamicin along with plant extract at the dose of 500mg/kg demonstrated a decrease in serum urea from 140.267 ± 8.21mg/dl to 59.40 ± 10.09 mg/dl as compared with the negative control group (P<0.01). Results are summarized in figure 1A.

**Serum creatinine:** Serum creatinine in plain control group was 0.7571 ± 0.10 mg/dl, whereas in negative control group, it increased to 2.443 ± 0.30 mg/dl. The post treated group showed significant decrease in serum creatinine from 2.443± 0.308 mg/dl to 0.746 ± 0.050 mg/dl as compared with negative control group (P<0.001). Results are represented graphically in figure 1B.

**Serum protein:** Serum protein in plain control group was 4.72 ± 0.07 mg/dl, in Gentamicin treated negative control group it was recorded as 7.44 ± 1.723 mg/dl. In the post-treated group there was significant decrease in serum protein level from 7.44 ± 1.723 mg/dl to 6.436 ± 0.219 mg/dl as compared with negative control group (P<0.001). Results are graphically represented in figure 1C.

In this study Serum creatinine, serum urea, serum protein were found to be significantly (P<0.001) increased in rats treated with only gentamicin, whereas treatment with ethanolic extracts of leaves of Adhatoda zeylanica, reversed the effect of gentamicin indicating nephroprotective activity.

Keywords: nephrotoxicity, Adhatoda zeylanica, gentamicin, free radicals, histopathology · Arunachalam Kumar
Figure 1: Graphic representation of effect of Adhatoda zeylanica at a dose of 500mg/kg on serum urea (fig 1 A), serum creatinine (fig 1B), and serum protein (1 C) in Gentamicin treated rats. n=6, values are expressed as Mean ± SEM of two measurements. Comparison between standard and extracts were performed by using Student’s ‘t’ test. In all these tests, criterion for statistical significance was P<0.05.

**Statistical Analysis:** All values were expressed as Mean ± SEM of two measurements. Comparison between standard

**Histopathological examination:** Control showed normal glomerular and tubular histology whereas Gentamicin
Discussion:

Adhatoda zeylanica (Acanthaceae) has a long history of use in traditional forms of oriental medicine and it has enjoyed popular use in India for a century. In addition, to its well-known other activity, the plant has ability to remove reactive oxygen species and Gentamicin nephrotoxicity involves generation of ROS. The beneficial effect of A. Zeylanica against gentamicin nephrotoxicity possibly depends on its ability to scavenge the gentamicin induced free radicals.

The ethanolic extract from the leaves was evaluated for antioxidative potential using DPPH radical scavenging activity, hydroxyl radical scavenging activity and reducing power assay. In all these assays Ellagic acid, a potent free radical scavenging compound was used as the standard.

The DPPH antioxidant assay is based on the ability of DPPH, a stable free radical, to decolorize in the presence of antioxidants. The DPPH radical contains an odd electron, which is responsible for the absorbance at 517 nm and also for visible deep purple color. When DPPH accepts an electron donated by an antioxidant compound, the DPPH is decolorized which can be quantitatively measured from the changes in absorbance.

Different studies have indicated that the electron donation capacity, reflecting the reducing power of bioactive compounds is associated with antioxidant activity [45]. The reducing ability of a compound generally depends on the presence of reductants, which have been exhibited antioxidative potential by breaking the free radical chain, donating a hydrogen atom. The presence of reductants (i.e. antioxidants) in Adathoda zeylanica leaves extracts causes the reduction of the Fe³⁺/ferri cyanide complex to the ferrous form. In this assay, yellow colour of the test solution changes to various shades of green and blue depending on the reducing power of antioxidant samples.

The measurement of \( \text{H}_2\text{O}_2 \) scavenging activity is one of the useful methods of determining the ability of antioxidants to decrease the level of pro-oxidants such as \( \text{H}_2\text{O}_2 \).[46] It can cross membranes and may slowly oxidize a number of compounds. Hydrogen peroxide itself is not very reactive, but sometimes it can be toxic to cells because of rise in the hydroxyl radicals in the cells [47]. In our study the results indicated that Adathoda zeylanica showed antioxidant activity compared with standard ellagic acid.

In the present study, an effort has been made to examine the nephroprotective ability of ethanolic leaf extract of Adathoda zeylanica.

Gentamicin is well recognized, to produce renal tubular necrosis mainly in the proximal tubule. This drug causes generation of reactive oxygen species (ROS), which induces

### Table II: Histopathological features of kidneys of rats of different treatment groups

<table>
<thead>
<tr>
<th>Histopathological features</th>
<th>Control</th>
<th>Gentamicin</th>
<th>Gentamicin and Adathoda Zeylanica treated group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glomerular congestion</td>
<td>-</td>
<td>+++</td>
<td>++</td>
</tr>
<tr>
<td>Peritubular congestion</td>
<td>-</td>
<td>+++</td>
<td>++</td>
</tr>
<tr>
<td>Blood vessel congestion</td>
<td>-</td>
<td>+++</td>
<td>+</td>
</tr>
<tr>
<td>Mononuclear infiltration</td>
<td>-</td>
<td>+++</td>
<td>+</td>
</tr>
<tr>
<td>Tubular casts</td>
<td>-</td>
<td>++</td>
<td>+</td>
</tr>
</tbody>
</table>

Histopathological changes are shown in Figure 2, Figure 3 and Figure 4.
cell injury and necrosis via lipid peroxidation [48, 49].

Our results clearly indicate that the gentamicin, at a dose of 80 mg/kg/day produces nephrotoxicity and it was evidenced by significant (p<0.001) elevation the increased serum creatinine and serum urea and serum protein concentrations when compared with the plain control group suggesting impairment in glomerular function. Serum creatinine concentration is a more significant indicator than the serum urea concentration at an earlier phase of kidney disease. The ability of the kidney to filter creatinine (a non-protein waste product of creatinine phosphate metabolism) is reduced during renal dysfunction as a result of diminished glomerular filtration rate. Thus, the increase in serum creatinine level is an indication of renal dysfunction [50]. The nephrotoxic effect was further corroborated by the histological findings in which many of the glomeruli showed diffuse eosinophilic sclerosis, engorged blood vessels and areas of hemorrhage indicating severe tubular necrosis, while in plain control group normal histopathological features were seen. This functional and structural derangement caused by toxic agent is in agreement with other reports showing its nephrotoxic effects.

The progressive weight loss in gentamicin treated rats may possibly be due to the injury renal tubules and the subsequent loss of the tubular cells to reabsorb water, leading to dehydration and loss of body weight.

The concurrent administration of Adhatoda zeylanica prevented the elevated level of serum creatinine and serum urea in albino rats administered gentamicin. Moreover, the elevated level of urinary protein was significantly reduced. These results suggest that Adhatoda zeylanica has an ability to prevent gentamicin-induced nephrotoxicity in albino rats.

Our results suggests that A. zeylanica at the dose used, was effective in mitigating the biochemical and histological changes induced by gentamicin. The nephrotoxic effects induced by gentamicin were significantly reversed. It is evident from the data that the effectiveness of the extract improved with the polarity of the solvents over a period of 10 days and the plant has the potential to ameliorate Gentamicin nephrotoxicity. The present study investigated the effect of Adhatoda zeylanica, in gentamicin-induced nephrotoxicity in albino rats. It may have potential to halt the development of Gentamicin induced nephrotoxicity in albino rats.

Acknowledgements:
The authors wish to thank the Research & Recognition Committee of Nitte University, Mangalore, for funding this study.

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ENTEROCOCCUS FAECALIS CAUSE FOR PERSISTING INFECTION A CONFOCAL ANALYSIS

Rahul Halkai¹, Mithra N. Hegde² & Kiran Halkai³

¹Ph.D. Student, ²Senior Professor & Head of the Department, Department of Conservative & Endodontics, A.B. Shetty Memorial Institute of Dental Sciences, Nitte University Mangalore - 575 018, ³Senior lecturer, Department of Conservative and Endodontics, S.N. Dental College, Gulbarga.

Correspondence
Rahul Halkai
PhD Student, Department of Conservative and Endodontics, A.B. Shetty Memorial Institute of Dental Sciences, Mangalore - 575 018
Mobile : +91 94816 36661  E-mail : drrahulendo@yahoo.co.in

Abstract:
Aim : to know ability of Enterococcus faecalis invasion into root dentin.
Methodology : Forty single rooted human intact teeth were selected, after access opening and canal debridement, all the samples were subjected for gamma sterilization to ensure complete absence of microorganisms, then exposed to Enterococcus faecalis broth, broth is placed with the help of micro pipette into root canal and also at the same time apical 1/3 of tooth were immersed into broth for 8 weeks, biomechanical preparation, obturation and coronal sealing done using GIC followed by examination under confocal laser scanning microscope after splitting the teeth samples into two halves buccolingually.
Results : This study shows invasion of Enterococcus faecalis upto 160 µm deep in to root dentin.
Conclusion : penetration and survival of Enterococcus faecalis deep into dentin in extreme conditions may be the possible reason for persisting infection after root canal treatment.
Keywords: Enterococcus faecalis, persisting infection, root dentin, confocal laser scanning microscope.

Introduction:
Because apical periodontitis is usually caused by bacteria, a major objective of root canal treatment is to eliminate bacteria from infected root canals. Although bacterial infection can be substantially reduced by standard intracanal procedures¹, it is difficult to render the root canal free from bacteria. Bacteria are located in inaccessible areas such as complicated root canal anatomy and dentinal tubules, and it is difficult to deliver antibacterial agents to these locations². Bacteria may survive and recolonize the root canal space whenever there is opportunity, and

Enterococcus faecalis is of interest because it is the most frequently detected species in root filled teeth with persistent lesions³. Some possible factors facilitating its long-term survival in the root canal system are its ability to invade dentinal tubules⁴, where it can survive for a prolonged period under adverse conditions such as starvation⁵ and the high pH of calcium hydroxide medication⁶. Although the mechanism of bacterial invasion is not completely understood, bacterial adhesion to dentinal tubule walls (TWs) is a logical early step in the process. Collagen is widely considered to be the primary substrate for specific binding of E. faecalis to dentine, and the collagen binding protein of E. faecalis (Ace) and a serine protease (Spr) have been proposed to play significant roles in binding to the root canal wall⁷. Ace also promotes E. Faecalis binding to collagen type I ⁸, and in vitro ace gene expression at 37 _C was enhanced in the presence of collagen⁹. However, in my study the interaction of E. faecalis specifically with dentinal tubules has been investigated.
Methodology:
The present in-vitro study was conducted in the Department of Conservative Dentistry and Endodontics, and central Research Laboratories. Teeth sterilization (gamma irradiation) done at Microtol, Bangalore. Data collection done using inverted confocal laser scanning microscope (ZEISS LSM 510 META. GmbH, Mannheim, Germany) at Indian Institute of Sciences (IISc) Bangalore.

Selection of Samples
Forty human single rooted teeth recently extracted for orthodontic reasons were collected for the study. After extraction the teeth were stored in chlorhexidine solution, until collection of all teeth.

Inclusion Criteria
Single rooted caries free teeth, examined under 20x magnification under a microscope to rule out any cracks, caries, fractures or craze lines and radiographed to determine the presence of a single canal were included for the present study.

Exclusion Criteria:
Teeth that had already undergone root canal treatment or teeth with more than one canal, immature root apices, teeth with root caries, restorations, fracture or craze lines, thin curved roots, calcified canals were excluded from the study.

Methodology:
The teeth were cleaned off soft tissue, calculus and stains with the help of sharp hand scalers and thoroughly washed under running tap water to remove any remaining tissue remnants sticking to the tooth surface and were stored in normal saline solution at room temperature until further use.

Procedure:
All the specimens were exposed to gamma irradiation (25 kGy) after access opening and canal debridement followed by culturing with E.faecalis broth placed within root canal with the help of pippette and apical one third of teeth submerged in the cultured broth for 8 weeks.

Culturing Procedure:
Enterococcus faecalis streptomycin resistant strains were cultured in Trypton Soyabean Agar broth. Broth is prepared by mixing the 1.8 grams powder in 60ml of distilled water. The prepared broth is sterilized in Autoclave, after that the strains are inoculated in the broth and placed in an Incubator for the bacteria to grow at 37ºC for 24-48hrs. For confirmation of the bacteria Gram staining was done. Then the cultured broth was inoculated within root canal of the teeth samples with a micropipette and also apical one third submerged in the broth. The whole process is refreshed every alternative two days for a period of 8 weeks.

Biomechanical Preparation & Obturation
After 8 weeks of culturing all the specimens were subjected to biomechanical preparation followed by obturation up to the working length. Working length was determined by using Root ZX II (J.Morita, Japan.). The root canal instrumentation was done using Protaper Ni-Ti rotary instrument system in a contra angle gear reduction hand piece (X-Smart Dentsply), finally obturated with gutta preach single cone using AH plus as sealer.

Culture and Observation:
After biomechanical preparation & obturation all the teeth specimens were again immersed into Enterococcus Faecalis broth for 8 weeks after incubation period the entire tooth washed using 1 ml phosphate buffered saline (PBS) to remove nonadherent bacteria. A vertical groove is made on bucco lingual surface starting from occlusal surface to apical tip using tapered fissure diamond point, then with the help of chisel tooth is splitted in two half’s segments (fig 1). splitted segments were observed under confocal laser scanning microscope (ZEISS LSM 510 META GmbH, Mannheim, Germany). After coding the samples, teeth were stained with 50 µL fluorescein diacetate (FDA sigma, st Louis, MO) and 50 µL of propidium iodide (PI, Sigma). FDA is nonfluorescent cell permeable dye that is converted to fluorescein (green) by intracellular esterases produced by metabolically active microorganism. PI is a fluorescent molecule impermeable to the cellular membrane and generally excluded from viable cell thus live

Keywords: Enterococcus faecalis, persisting infection, root dentin, confocal laser scanning microscope. - Rahul Halkai
bacterial cells are fluorescent green, whereas dead bacteria with damaged membranes are fluorescent red. The samples were examined on inverted confocal laser scanning microscope for the presence of E. Faecalis in root dentin. Data was subjected to appropriate statistical analysis. We have used SPSS software for statistical analysis.

**Keywords:** Enterococcus faecalis, persisting infection, root dentin, confocal laser scanning microscope.

**Table 1:** Data table. Score for ADHESION is 1, for NO ADHESION is 0 and for PENETRATION of E. Faecalis in dentin measured in µm.

<table>
<thead>
<tr>
<th>Samples / Groups</th>
<th>Group I</th>
<th>Group II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample 1</td>
<td>0</td>
<td>145</td>
</tr>
<tr>
<td>Sample 2</td>
<td>0</td>
<td>132</td>
</tr>
<tr>
<td>Sample 3</td>
<td>0</td>
<td>146</td>
</tr>
<tr>
<td>Sample 4</td>
<td>0</td>
<td>157</td>
</tr>
<tr>
<td>Sample 5</td>
<td>0</td>
<td>144</td>
</tr>
<tr>
<td>Sample 6</td>
<td>0</td>
<td>160</td>
</tr>
<tr>
<td>Sample 7</td>
<td>0</td>
<td>148</td>
</tr>
<tr>
<td>Sample 8</td>
<td>0</td>
<td>124</td>
</tr>
<tr>
<td>Sample 9</td>
<td>0</td>
<td>148</td>
</tr>
<tr>
<td>Sample 10</td>
<td>0</td>
<td>134</td>
</tr>
<tr>
<td>Sample 11</td>
<td>0</td>
<td>153</td>
</tr>
<tr>
<td>Sample 12</td>
<td>0</td>
<td>122</td>
</tr>
<tr>
<td>Sample 13</td>
<td>0</td>
<td>144</td>
</tr>
<tr>
<td>Sample 14</td>
<td>0</td>
<td>160</td>
</tr>
<tr>
<td>Sample 15</td>
<td>0</td>
<td>156</td>
</tr>
<tr>
<td>Sample 16</td>
<td>0</td>
<td>142</td>
</tr>
<tr>
<td>Sample 17</td>
<td>0</td>
<td>125</td>
</tr>
<tr>
<td>Sample 18</td>
<td>0</td>
<td>160</td>
</tr>
<tr>
<td>Sample 19</td>
<td>0</td>
<td>142</td>
</tr>
<tr>
<td>Sample 20</td>
<td>0</td>
<td>158</td>
</tr>
</tbody>
</table>

**Table 2:** Mean, SD and Student’s T-Value for Penetration into Dentin

<table>
<thead>
<tr>
<th>GROUP</th>
<th>I</th>
<th>II</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEAN</td>
<td>0</td>
<td>145</td>
</tr>
<tr>
<td>S.D</td>
<td>0</td>
<td>11.9833</td>
</tr>
<tr>
<td>T-VALUE</td>
<td>52.74</td>
<td></td>
</tr>
</tbody>
</table>

**Conclusion:** T-Value Shows Significant Difference For P>0.05

**Results:**

FDA/PI staining technique showed absence of any dead or alive E. Faecalis in group I samples (fig 2). On other hand group II samples showed green and red colour coccosidal structure observed under confocal laser scanning microscope (fig 3, 4). Samples showed presence of Enterococcus faecalis up to 160 µm deep in root dentin (fig 5) in all the samples of group II (table 1). Results were subjected to statistical analysis using T test. T value (table 2) is 52.74. To conclude, T value is 52.74 (T-value shows significant difference for p>0.05) this shows significant presence of Enterococcus Faecalis in root dentin (Graph 1).

**Discussion:**

In this study E Faecalis was chosen as the test organism because Enterococcus faecalis found to penetrate deep into dentinal tubules in vitro, and enterococcus faecalis is one among the micro organisms found in reinfection and also Enterococcus faecalis produces protein during stress like Ace and serine protease (spr) protein which in turn help enterococcus faecalis adhere to type I & IV collagen present in root dentin.

The adhesion of E Faecalis to type I and IV collagen is the basis of my study because, root dentin consist of mainly type I and type IV collagen. Other factors facilitating Enterococcus faecalis presence in obturated root canals with persistent lesions include, it can survive in high pH and has long starvation period and in presence of serum ability to recover. Enterococcus faecalis has ability to survive long term in root canal without nutrients.

Bacteria encounters with variety of stressful conditions in the root canal, such as nutrient deficiency, other bacterial toxins and intra canal medicaments, these conditions may regulate bacterial adhesin expression. Addition to it, when ever serum leakage into the root canal, inducing the expression of Aggregation substance (AS) and other carbohydrate moieties, thereby helping bacteria to adhere, even alkaline pH obtained by calcium hydroxide at the dentinal zone is ineffective due to deeper penetration of Enterococcus faecalis. Other mechanisms of survival may be through Lipoteichoic acids (LTA), which resist the bacterium against many lethal conditions.

E. faecalis prevents the other bacteria growth with cytolysin, AS-48 (Aggregation substance), and bacteriocins, erythrocytes are the target cells of cytolysin also PMNs and macrophages and a broad range of Gram-positive but not Gram-negative organisms. The bacteriocin effect of cytolysin of E. faecalis helps colonization of the Gram-negatives, there could be a shift of bacterial flora related...
Fig 1: Indentation is made on bucco lingual surface occlusal apically using tapered fissure diamond point, spitted in two half’s using chisel.

Fig 2: Group I samples showed no traces of Enterococcus faecalis presence in root dentin under confocal laser scanning microscope.

Fig 3: Group II samples showing presence of alive and dead Enterococcus faecalis into root dentin.

Fig 4: Group II samples showing presence of separate alive (green) and dead (red) Enterococcus faecalis into root dentin.

Fig 5: Group II samples showing invasion of Enterococcus faecalis upto 160 µm deep into root dentin.

Keywords: Enterococcus faecalis, persisting infection, root dentin, confocal laser scanning microscope. - Rahul Halkai
with periodontal disease, the later factors is non pathogenic in humans. Along with cytolysin, they facilitate the dominance of E. faecalis in a mixed infection and serve as means to obtain ecological advantages which can result in disease in man. The root canal hardly contains any nutrient-rich medium, but when required E. faecalis may derive the energy it needs from the hyaluronan present in the dentin by breaking down hyaluronidase or E. faecalis may also feed on fluid present in the dentinal tubules. So it seems that even well obturated fluid tight seal does effect the survival of Enterococcus faecalis because it can generate energy to survive. The foci of infection is E Faecalis present deep inside the dentin or cementum that cannot be reached by host defence cells such as PNM, lymphocytes and macrophages etc. E faecalis elicits permanent provocative effect on the host defence cell mechanism which in turn damages periradicular region.

We used gamma irradiation method to sterilize the teeth because it does not alter collagen characteristics which is very important for E Faecalis to adhere to collagen, other methods of sterilization of teeth samples are by autoclave, hot air oven etc. Disadvantages of autoclave is it collapses the collagen strands and use of hot air oven makes teeth dehydrated and more brittle.

Previously most of the methods like fluorescent probes used failed to detect viability of bacterial and also spatial distribution bacterial viability could be checked by using conventional fluorescence microscopy but the disadvantage is decalcification of the teeth samples, creating artificial condition, high background haze makes difficult to distinguish between individual cells.

In this context, better methodologies for the identification of bacterial viability in dentin are needed. The CLSM (ZEISS LSM 510 META GmbH, Mannheim, Germany) analysis has advantage over the conventional fluorescence microscopy to visualize bacteria. In fact our research confirms ability of E Faecalis to infect root dentin and also shows the vitality of the bacteria in root dentin.

The visualisation of live and dead bacteria in root dentin using confocal microscopy, this method gives information about the root dentin infection and vitality of bacteria in the dentin determined in effective way at the cellular level.

Conclusion:
The mechanism of bacterial invasion is not completely understood, bacterial adhesion to dentinal tubule walls (TWs) is a logical early step in the process. Collagen is widely considered to be the primary substrate for specific binding of E. faecalis to dentin and the collagen binding protein of E. faecalis (Ace) and a serine protease (Spr) have been proposed to play significant roles in binding to the root canal wall. Ace also promotes E. faecalis binding to collagen type I and IV and in vitro ace gene expression at 37°C was enhanced in the presence of collagen. There is 40% available collagen present in root dentin, collagen present in root dentin might help enterococcus faecalis to inhabit in dentin, and might be possible reason for treatment failure or in ability to control infection.

Even after applying or using latest methods like rotary endodontics crown down technique and use of latest root sealers like, still we have failure or re infection cases. by our study we are able to examine viable and dead Enterococcus faecalis even after proper root canal treatment. To conclude we need to rethink in terms of sterilization of root canal, may be the use of any other methods of root canal disinfection may help in eradicating micro organisms from root canal to certain extent for predictable success in root canal treatment.

References:


Keywords: Enterococcus faecalis, persisting infection, root dentin, confocal laser scanning microscope. - Rahul Halkai
PREVALENCE OF MENTAL RETARDATION AMONG CHILDREN IN MANGALORE

Bhagya B. & Ramakrishna A.

Abstract:

Objectives: This study determines the prevalence of mental retardation among school going children in Mangalore by sex, age, religion, and location. Distribution of severity of mental retardation and its relationship with age of diagnosis is reported.

Materials and methods: The prevalence was obtained from the Inclusive Education Resource Centre reports of 2011. Sex, age, religion and living area were evaluated for each child. Parents of the mentally retarded children were interviewed to record the age of diagnosis. Intelligence Quotient was assessed using Binet Kamat Test, Seguin Form Board and Vineland Social Maturity Scale.

Results: The prevalence of mental retardation was 561 of the total disabilities recorded. The prevalence of MR was higher among males than in females (p<0.001). No notable sex difference between rural and urban areas was seen. Prevalence was higher among Hindus and between 9 to 12 years of the age group. Most of them had mild MR (48.15%). Severe and Profound MR were diagnosed at a much earlier age group than in mild and moderate types.

Conclusion: This study provides an insight to the school going children with mental retardation. Further research on study of causes for MR is needed for service planning.

Keywords: Mental retardation, Children, Prevalence, Intelligence Quotient, Mangalore
has been stated by Pati\textsuperscript{10} in two villages of Karnataka. The prevalence of disability is higher among females than males.\textsuperscript{9,12} Mangalore taluk is situated in Karnataka state in Southwest India. According to the census of population 2011\textsuperscript{13} the total population is 9,898,562 (2,09,578 rural vs 7,80,278 urban). The number of males 4,88,875 and females is 5,00,981. Male literacy is 86.12%, while female literacy is 80.31%.\textsuperscript{12} Mangalore is composed of heterogeneous population and represents a mixture of rich ethnic and cultural diversity. The present study provides an overview of children with MR in Mangalore taluk which to the best of our knowledge is not reported.

Materials & Methods:
In this descriptive study, the data were obtained from the official records of Inclusive Education Resource Centre (IERC) of Mangalore during the year 2011. The IERC is a programme by the Government of India to educate and mainstream the children with disabilities under the Sarva Shiksha Abhiyan (Education for all movement). The IERC adopts a stratified multistage sampling design for collecting the disability data. Mangalore taluk is divided into North and South block which are further divided into thirteen and fifteen clusters respectively. In the North block there are 317 schools of which 4 are special schools, similarly in the South block there are 322 schools of which 2 are special schools and one integrated school. The number of school going children in the rural area is 70,121 and 67,246 in the urban. The details of each child which includes name, date of birth, age, sex and religion from all the schools in each cluster is consolidated. Children who belong to any one of the ten disabilities as outlined by The Ministry of Human Resource Development will be listed accordingly. To know the age of diagnosis and type of MR parents of 324 children were interviewed. The parents especially the mother was informed of the study, written consent was taken, before interviewing and referring the medical records of the child to note the age of onset of diagnosis for MR. Intelligence quotient (IQ) was assessed using Binet Kamat Test, Seguin Form Board and Vineland Social Maturity Scale. This study is approved by the University Ethics committee. All the collected data were tabulated and analyzed by SPSS version 13.0 for Windows. Findings are described in terms of percentages. Chi-square test and Fisher’s exact test was carried out to test the differences between proportions. A probability level of less than 0.05 is considered significant.

Results & discussion:
In Mangalore a total of 2,823 children were recognized with different types of disabilities. About 561 children with mental disorder were identified, with 37.3% (209) in the rural with a prevalence rate of 3 per 1000 and 62.7% (392) in the urban area having a prevalence rate of 5 per 1000. Distribution of children with MR by sex, religion, age and location is presented in Table 1. Some Indian studies have reported a prevalence rate of psychiatric disorders in children ranging from 2.6 to 35.6 percent.\textsuperscript{14-16} Prevalence rates ranging between 1/1000 – 6/1000 are reported from Ghana, Thailand, and Cuba.\textsuperscript{17} The prevalence of MR was higher among males than in females (p<0.001) which are in support with other studies, but there was no notable sex difference between rural and urban areas (Fig 1). Among the religions prevalence was higher among Hindus. More children were found between 9 to 12 years of the age group which is in support of other reports.\textsuperscript{20} Prevalence according to severity of MR and age of diagnosis is shown in Table 2. Of the 324 MR children observed 48.15% of them showed mild MR followed by 29% moderate, 14.2% severe and 8.6% profound MR (Fig 2). A study among people with mental disability in four villages of Udupi, Karnataka, India presented mild, severe, moderate and profound types of MR with 45.5%, 27.3%, 18.2% and 9.1% respectively.\textsuperscript{9} Severe and Profound MR were diagnosed at a much earlier age group than in mild and moderate types.

Conclusion: There is a lack of up-to-date statistics on children with mental disability in Mangalore. This study provides an insight to the school going children with mental retardation. Future research is needed to look into the causes for MR, proper classification and early intervention for capacity building and raising awareness. These estimates have major implications for service planning and warrant further study.

Keywords: Mental retardation, Children, Prevalence, Intelligence Quotient, Mangalore - Bhagya B.
Acknowledgements:
The authors acknowledge the financial assistance under the Yenepoya University Seed Grant Scheme (2011-017). Authors are grateful to Block Resource Centre co-ordinator – Mangalore North range and Mangalore South range of Inclusive Education Resource Centre for their support. The authors also thank all the participants who contributed in this study.

Table 1: Distribution of children with MR by sex, age, religion and location

<table>
<thead>
<tr>
<th>Location</th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>121 (57.89)</td>
<td>203 (57.67)</td>
</tr>
<tr>
<td>Female</td>
<td>88 (42.1)</td>
<td>149 (42.33)</td>
</tr>
<tr>
<td>Age</td>
<td>5 to 8</td>
<td>9 to 12</td>
</tr>
<tr>
<td>78 (37.32)</td>
<td>116 (55.5)</td>
<td>15 (7.2)</td>
</tr>
<tr>
<td>5 to 8</td>
<td>87 (24.7)</td>
<td>164 (46.6)</td>
</tr>
<tr>
<td>Religion</td>
<td>Hindu</td>
<td>Muslim</td>
</tr>
<tr>
<td>108 (51.7)</td>
<td>90 (43.1)</td>
<td>11 (5.3)</td>
</tr>
<tr>
<td>204 (57.9)</td>
<td>64 (18.2)</td>
<td>82 (23.3)</td>
</tr>
</tbody>
</table>

Percent in parenthesis

Table 2: Distribution of severity of MR by age of diagnosis

<table>
<thead>
<tr>
<th>Age of diagnosis (years)</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
<th>Profound</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to &lt; 1</td>
<td>14 (9.0)</td>
<td>6 (6.4)</td>
<td>36 (78.3)</td>
<td>20 (71.4)</td>
<td>76 (23.5)</td>
</tr>
<tr>
<td>1 to &lt; 2</td>
<td>24 (15.4)</td>
<td>10 (10.6)</td>
<td>4 (8.7)</td>
<td>8 (28.6)</td>
<td>46 (14.2)</td>
</tr>
<tr>
<td>2 to &lt; 3</td>
<td>38 (24.4)</td>
<td>30 (31.9)</td>
<td>6 (13.0)</td>
<td>0 (0)</td>
<td>74 (22.8)</td>
</tr>
<tr>
<td>3 to &lt; 4</td>
<td>60 (38.5)</td>
<td>42 (44.7)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>102 (31.5)</td>
</tr>
<tr>
<td>4 to 5</td>
<td>20 (12.8)</td>
<td>6 (6.4)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>26 (8.0)</td>
</tr>
<tr>
<td>Total</td>
<td>156 (100)</td>
<td>94 (100)</td>
<td>46 (100)</td>
<td>28 (100)</td>
<td>324 (100)</td>
</tr>
</tbody>
</table>

Percent in parenthesis
p=0.029

References:
13. www.censuskarnataka.gov.in
SEVERITY OF MOBILE PHONE AND INTERNET USE AMONG B.SC. NURSING STUDENTS

Arpita Kumari¹, Melita Shiny D'souza², Thiangmon Dhar³, Savitha⁴ & Soumya Alex⁵

¹,² P.B. B.Sc. Nursing Students, ³Assistant Professor, Department of Mental Health / Psychiatric Nursing, ⁴Assistant Lecturer, Department of Fundamentals of Nursing, Manipal College of Nursing Manipal, Manipal University 576104, Karnataka, India

Correspondence:
Savitha
Assistant Professor, Department of Mental Health / Psychiatric Nursing, Manipal College of Nursing Manipal, Manipal University, Manipal - 576 104, Karnataka, India.
E-mail : chaitrachandan@yahoo.co.in, savitha.umesh@manipal.edu

Abstract:
Introduction: India continues to be one of the fastest growing major telecom markets in the world. Around 60 million of internet users are from India and 19 to 40 years age group section 85% using internet in India. Young nurses today have wide spread and inexpensive access to the internet.

Aims and Objectives: To assess the severity score of mobile phone use and internet use among BSc. Nursing students and to find the relationship between mobile phone and internet use.

Study design: descriptive survey.

Methods and materials: The study was conducted among 114 BSc. nursing students in Manipal College of nursing Manipal. A convenient sampling technique was used. The data was obtained by using a demographic proforma, mobile phone addiction test and internet addiction test.

Results: Most of the subjects 50 (43.9%) belongs to 19-20 years of age. 1.8% subjects reported of having mild addiction to mobile phone use. Three (2.6%) subjects had moderate internet addiction and 35 (30.7%) subjects reported of having mild internet addiction. The ‘r’ value (r=0.610, p= ≤ 0.001) showed that there is a positive relationship between use of mobile phone and internet use.

Keywords: Mobile phone use, internet use, severity score, B.Sc. Nursing students.

Introduction:
The mobile sector in India has grown more than tenfold from 2001 to around 60 million subscribers by mid-2005. India is among top 10 nation using a smart offering mobile, internet ideal for corporate business and professionals. Around 60 million of internet users are from India and 19 to 40 years age group section 85% using internet in India. Majority 85% of internet users in India are male, 15% old men, 14% school going, 21% college students, 46% graduates and 26% post graduates. A mobile phone survey conducted in 2010 suggest that among 2,85,000 urban and rural Indians covering all state and union territory 574 district 3175 towns and 2,800 villages in India, 1,78,000 are mobile users and 25-35 years is the single largest mobile phone user age group¹.

Computers are readily available for the use in many nursing schools, colleges, library and hospitals. The internet is both convenient and anonymous. Internet has many functions, is used to gather information about advanced technology in nursing interventions and gathering the data about other health related issues, to meet new friends, to chat with current friends and as a source of entertainment².

Ezoe et al. (2000) conducted a study in Osaka among 43 male and 155 female nursing students to assess the relationship of personality and lifestyle with mobile phone dependence. The results showed that female nursing students with higher trait of extroversion and neuroticism and unhealthy lifestyle are prone to have high level of dependence.

Keywords: Mobile phone use, internet use, severity score, B.Sc. Nursing students.
mobile phone dependency.

A survey study conducted to assess the impact of mobile phone and the internet use on self-reported behavioural changes among 542 undergraduate college students of Udupi district in 2007 by Swapna Jose. She found that 53.3% of the students reported that they use to chat with friends, 0.85% students reported of chatting with family members.

The information gathered by the study can be used by nursing professionals to understand its relevance to their work as well as for initiating and maintaining communal effort to prevent the harmful effects of media overuse.

Methods and Materials
The descriptive survey design was adopted and study was conducted among 114 BSc. nursing students in Manipal College of Nursing Manipal using convenient sampling technique. Administrative permission was obtained from Dean, Manipal College of Nursing Manipal and heads of the nursing institutions to conduct pretesting, reliability, pilot study and main study. Informed consent was taken from the study subjects. The data was collected during the month of January 2012.

Background information was collected by using a demographic proforma which had 18 items. The severity of mobile phone use was assessed using a Mobile phone addiction test which is a six point Likert scale. The scale had 15 items. There were 6 alternatives not at all, rarely, occasionally, frequently, very often, always. The response was scored as not at all -0, always-1, very often-2, frequently-3 occasionally-4, rarely-5. The maximum score was 75 and minimum score was 0. The score obtained was classified which include severe addiction (65-75), moderate addiction (55-64), mild addiction (45-54), no addiction (<45). The internet addiction test was used to assess the severity of internet addiction. This is a 20 items questionnaire on which respondent are asked to rate item on a six point Likert scale, covering the degree to which their internet use affects their routine, social life, sleeping pattern and feelings. The scale had 20 items. There were 6 alternatives rarely, occasionally, frequently, very often, always and does not apply. The maximum score was 100 and minimum score was 0. The scores were arbitrarily classified as severe addiction (80-100), moderate addiction (50-79), mild addiction (20-49) and no addiction (<20). Items were constructed after reviewing the literature and existing tools and content validity was established by giving it to the experts in the field of Psychiatry, Clinical Psychology, Child Health Nursing, and Community Health Nursing. Acceptable reliability and validity have been established in research. The reliability of the tools was checked by using Cronbach’s alpha method. Reliability coefficient obtained for mobile phone use and internet addiction was 0.8 and 0.84 respectively. Demographic variables, mobile phone use and internet addiction were analyzed with frequency and percentage. To find the relationship between mobile phone and internet use, Pearson correlation ‘r’ was computed.

Results:
The study findings (presented in table 1) revealed that out of 114 subjects, most of the subjects 50 (43.9%) belongs to the age group of 19-20 years. Majority 107 (93.9%) of them were females. 47 (41.2%), of the subjects were residing in urban area, most of them 34 (29.8%) had monthly family income of Rs. 5,000-10,000. Majority of the subjects were from nuclear family 100 (87.7%) and they were single siblings (54.4%), most of the subject’s fathers were working 57 (50%), majority of them were staying in hostel 98 (86%), and 107 (93.9%) of the subjects had a good mobile network connection, majority of them 96 (84.2%) possessed mobile phone.

Study showed that among 114 subjects, there is no severe and moderate addiction to mobile phone. Two (1.8%) subjects reported of having mild addiction and 112 (98.2%) of them were not addicted to mobile phone use which is shown in table 2.

Pie diagram represents that there is no severe addiction to internet use, three (2.6%) subjects were moderately addicted, 35 (30.7%) of them were mildly addicted and 76 (66.7%) subjects were not addicted to internet use.

Keywords: Mobile phone use, internet use, severity score, B.Sc. Nursing students - Savitha
The Spearman’s Correlation ‘r’ showed that there was a significant relationship between mobile phone and internet use \((r=0.610, p=0.001)\) which is shown in table 3.

Discussion:
The present study revealed that among 114 subjects 112 (98.2%) reported of having no mobile phone addiction and 2 (1.8%) with mild addiction to mobile phone use. The study findings are supported by a study conducted by Bianchi and Phillips in Sweden (2009) to assess the information and communication technology affecting young generation among 548 young populations. The result showed that 88.7% reported being average users, 8.4% heavy users and 2.9% is cell phone addicted. The study also found that among 114 subjects 3(2.6%) reported of having moderate internet addiction behaviour. 35 (30.7%) mild addiction, 76(66.7%) with no internet addiction. A study which supports these study findings, conducted by Kratzer in Florence, Italy to identify the prevalence of internet abuse and the presence of multiple addictions in an adolescent high school population. 5.4% of the students are found to be internet addicted. The study concluded that behavioural addiction is multiple source of disability and they are related to substance abuse.

In this study, the ‘r’ value \((r=0.610, p=\leq 0.001)\) showed that there is a positive relationship between use of mobile phone and internet use. These findings are supported by a study conducted by Jose Swapna (2009) to assess the impact of mobile phone and internet use on self-reported behavioural changes among 542 undergraduate students of selected colleges in Udupi district. She found that there was a positive correlation between the use of internet and mobile phone \((r=0.442, p<0.05)\).

The study found that out of 114 subjects, most of the subjects belongs to the age group of 17-18 years, majority 50(43.9%) are between 19-20 years of age, 35 (30.7%) subjects are in the age group of 21-22 years and minimum subject belong to 23-24 years of age. Similar findings were found in a study by Mark Hefflingre (2007) in China, which showed that 13% of Chinese internet users are under the age of 18 years. 23% of the internet users are between the age group of 18 – 34 years. 9% of the users are in the age group of 35 – 49 years and only 3% of users are over 50 years.

Conclusion:
Most of the study subjects, 35 (30.7%) reported of having mild internet addiction and 3 (2.6%) subjects had moderate internet addiction. Nursing professionals need to understand the relevance of mobile phone and internet use in their work place as well as for initiating and maintaining communal effort to prevent the harmful effects of media overuse.

Acknowledgment:
We acknowledge Manipal College of Nursing Manipal, New City College of nursing, Vidya College of nursing, Vidyaratna College of Nursing, Udupi for permitting to conduct the main study, pretesting, reliability and pilot study respectively. We also acknowledge the students of these nursing colleges for their willingness to participate in the study.

Table 1: Frequency and percentage distribution of sample characteristics (n=114)

<table>
<thead>
<tr>
<th>Sample Characteristics</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (in years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17 - 18</td>
<td>25</td>
<td>21.9</td>
</tr>
<tr>
<td>19 - 20</td>
<td>50</td>
<td>43.9</td>
</tr>
<tr>
<td>21 - 22</td>
<td>35</td>
<td>30.7</td>
</tr>
<tr>
<td>23 - 24</td>
<td>04</td>
<td>3.5</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>07</td>
<td>6.1</td>
</tr>
<tr>
<td>Female</td>
<td>107</td>
<td>93.9</td>
</tr>
<tr>
<td><strong>Year of present graduation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First</td>
<td>38</td>
<td>73.3</td>
</tr>
<tr>
<td>Second</td>
<td>27</td>
<td>23.7</td>
</tr>
<tr>
<td>Third</td>
<td>22</td>
<td>19.3</td>
</tr>
<tr>
<td>Fourth</td>
<td>27</td>
<td>23.7</td>
</tr>
<tr>
<td><strong>Place of residence</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>30</td>
<td>26.3</td>
</tr>
<tr>
<td>Urban</td>
<td>47</td>
<td>41.2</td>
</tr>
<tr>
<td>Semi urban</td>
<td>37</td>
<td>32.5</td>
</tr>
<tr>
<td><strong>Monthly family income (in rupees)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;5,000</td>
<td>14</td>
<td>12.3</td>
</tr>
<tr>
<td>5,000 - 10,000</td>
<td>34</td>
<td>29.8</td>
</tr>
<tr>
<td>10,001 - 15,000</td>
<td>32</td>
<td>28.1</td>
</tr>
<tr>
<td>&gt;15,000</td>
<td>34</td>
<td>29.8</td>
</tr>
<tr>
<td><strong>Type of family</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nuclear</td>
<td>100</td>
<td>87.7</td>
</tr>
<tr>
<td>Joint</td>
<td>14</td>
<td>12.3</td>
</tr>
</tbody>
</table>

**Keywords:** Mobile phone use, internet use, severity score, B.Sc. Nursing students - Savitha
Sample Characteristics | Frequency (f) | Percentage (%)
--- | --- | ---
Number of siblings in family  
- a. One 62 54.4  
- b. Two 32 28.1  
- c. Three 10 8.8  
- d. More than three 10 8.8  
Working member in the family  
- a. Father 57 50.0  
- b. Mother 14 12.3  
- c. Both 40 35.1  
- d. If others, specify 03 2.6  
Currently staying in  
- a. Home 16 14.0  
- b. Hostel 98 86.0  
Whether place of stay has good mobile network connection  
- a. Yes 16 14.0  
- b. No 98 86.0  
Mobile phone possession  
- a. Yes 107 93.9  
- b. No 07 6.1  
I call my friends  
- a. Once in a while 28 24.6  
- b. Once a day 06 5.3  
- c. At least 2-3 times a day 06 5.3  
- d. Once in a week 32 28.1  
- e. Whenever I need help 42 36.8  
I call my parents  
- a. Whenever I need help 12 10.5  
- b. Once in a while 02 1.8  
- c. Once a day 55 48.2  
- d. Twice a day 23 20.2  
- e. Every week 22 19.3  
How many percentage of calls are related to education?  
- a. 100 04 3.5  
- b. 80 23 20.2  
- c. 60 38 33.3  
- d. 40 49 43.0  
How many percentage of calls are personal?  
- a. 100 12 10.5  
- b. 80 41 36.0  
- c. 60 24 21.1  
- d. 40 37 32.5  
Independently possessed mobile phone at the age of (in years)  
- a. <16 14 13.2  
- b. 16 – 18 40 35.1  
- c. 19 – 21 55 48.2  
- d. 22 – 24 04 3.5  
Pocket money per month (in rupees)  
- a. <3,000 80 70.2  
- b. 3,000 – 5,000 30 26.3  
- c. 5,000 04 3.5  
Amount of money spent on mobile phone usage (in rupees) per month  
- a. <500 106 93.0  
- b. 500 – 1,000 06 5.3  
- c. 1,001 – 1,500 01 0.9  
- d. >1,500 01 0.9  
Availability of internet connection at home/hostel  
- a. Yes 43 37.7  
- d. No 71 62.3

Table 2: Frequency and percentage distribution of mobile phone use (n=114)

<table>
<thead>
<tr>
<th>Severity Score</th>
<th>Range of score</th>
<th>Frequency(f)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe Addiction</td>
<td>65-75</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Moderate Addiction</td>
<td>55-64</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mild Addiction</td>
<td>45-54</td>
<td>2</td>
<td>1.8</td>
</tr>
<tr>
<td>No Addiction</td>
<td>&lt;45</td>
<td>112</td>
<td>98.2</td>
</tr>
</tbody>
</table>

Table 3: Relationship between mobile phone use and internet use (n=114)

<table>
<thead>
<tr>
<th>Variables</th>
<th>r</th>
<th>’p’ value</th>
<th>Level of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of mobile phone and Internet use</td>
<td>0.610</td>
<td>&lt;0.001</td>
<td>S</td>
</tr>
</tbody>
</table>

Fig 1- Pie Diagram Representing frequency and percentage distribution of internet use

References:
ALKALINE PHOSPHATASE – A DIAGNOSTIC MARKER OF PERIODONTITIS IN POSTMENOPAUSAL WOMEN – A BIOCHEMICAL STUDY

Amitha Ramesh, Rahul Bhandary, Biju Thomas, Sheehan R. D’ Souza & Suchetha Kumari

Professors, HOD & Professor, Post Graduate Student, Department of Periodontics, A.B. Shetty Memorial Institute of Dental Sciences, Professor, Department of Biochemistry, K.S. Hegde Medical Academy, Nitte University, Deralakatte, Mangalore - 575 018, India.

Correspondence: Sheehan R. D’ Souza
Department of Periodontics, A.B. Shetty Memorial Institute of Dental Sciences, Nitte University Deralakatte, Mangalore - 575 018
Mobile: +91 99646 68191  E-mail: sheehan_dsouza999@yahoo.com

Abstract:
Background and objective: Periodontal disease is one of the common inflammatory diseases with complex etiology and is multifactorial in origin. Several enzymes are evaluated for the early diagnosis of periodontal disease. The enzyme ALP plays a role in bone metabolism. In the periodontium, ALP is very important enzyme as it is part of normal turnover of periodontal ligament, root cementum, and bone homeostasis. The deficiency of estrogen in women at menopause is contributing factor to osteoporosis and considered one of the risk factors for periodontal disease. It has been hypothesized that osteoporosis decreases alveolar bone density and in turn increases its susceptibility to resorption due to periodontal inflammation. Accelerated bone loss in menopause is related to increased bone turnover. This is accompanied by increased levels of biochemical markers such as Alkaline Phosphatase. Alteration in salivary Alkaline Phosphatase levels might be expected as an indication of periodontal disease activity.

Methods: The study included 40 subjects, 20 in each group in the age group of 50-60 years. Group 1 comprised of 20 Postmenopausal women without chronic periodontitis. Group 2 comprised of 20 Postmenopausal women with chronic periodontitis. Each saliva sample was estimated for ALP levels.

Results: The present study showed significant increase in Alkaline Phosphatase in postmenopausal women with periodontitis (Group 2) with p value <0.0001.

Interpretation and conclusion: Alkaline phosphatase can be used as a diagnostic marker of Periodontitis in postmenopausal women. However ALP cannot be solely responsible for Periodontitis but it can be used as a additional aid in diagnosing Periodontitis.

Keywords: Alkaline phosphatase, Periodontitis.

Introduction:
Periodontal disease is one of the common inflammatory diseases with complex etiology and is multifactorial in origin. Salivary components for periodontal diagnosis include enzymes and immunoglobulins, hormones of host origin, bacteria and bacterial products, ions, and volatile compounds. Several enzymes that are evaluated for the early diagnosis of periodontal disease are aspartate and alanine aminotransferase (AST, ALT), lactate dehydrogenase (LDH), creatine kinase (CK), alkaline phosphatase and acid phosphatase (ALP, ACP). The enzyme ALP plays a role in bone metabolism. It is a membrane-bound glycoprotein produced by many cells, such as polymorphonuclear leukocytes, osteoblasts, macrophages, and fibroblasts within the area of the periodontium and gingival crevice.

In the periodontium, ALP is very important enzyme as it is part of normal turnover of periodontal ligament, root cementum and maintenance, and bone homeostasis. The deficiency of estrogen in women at menopause is contributing factor to osteoporosis and considered one of the risk factors for periodontal disease. It has been
hypothesized that osteoporosis decreases alveolar bone density and in turn increases its susceptibility to resorption due to periodontal inflammation. Accelerated bone loss in menopause is related to increased bone turnover. This is accompanied by increased levels of biochemical markers such as Alkaline Phosphatase. Alteration in salivary Alkaline Phosphatase levels might be expected as an indication of periodontal disease activity.

Materials and methods:

Patient selection:
The study was a case control study comprising of 40 subjects, 20 in each group.
‘ Group 1: 20 Postmenopausal women without chronic periodontitis, in the age group of 50-60 years.
‘ Group 2: 20 Postmenopausal women with chronic periodontitis, in the age group of 50-60 years.
The subjects were selected from the Department of Periodontics, A.B. Shetty Memorial Institute of Dental Sciences, Mangalore. A written informed consent was taken from each subject.

The ethical clearance was obtained from ethical board of NITTE UNIVERSITY. The study was conducted from June 2012 to November 2012.

Clinical examinations:
The clinical evaluation of all study participants were carried out to characterize their gingival and periodontal conditions. It included the evaluation of clinical attachment loss (mm) which was recorded using a William’s graduated periodontal probe. Probing was performed at 6 sites per tooth (mesiobuccal, distobuccal, mesiolingual, distolingual, midbuccal, midlingual and Gingival index scores given by loe and silness. The samples were coded before being sent for laboratory investigations All data describing the clinical characteristics were collected by the same examiner.

Saliva collection:
1 ml of whole saliva sample in a sterile disposable plastic container, patients were instructed not to eat 1 hour before collection of sample.

Estimation of Alkaline Phosphatase:
For analysis, each saliva sample was centrifuged at 5000 rpm for 10 minutes. Reagents added to about 10 microlitre of supernatant sample by auto analyzer and the value of ALP estimated in U/L.

The reagents used in estimation of saliva ALP are:
Reagent 1(R1)    Diethanolamine Buffer, (pH 10.2)
Magnesium Chloride
Reagent 2(R2)    p- Nitrophenyl Phosphate

Statistical analysis:
The result obtained were tabulated and subjected to statistical analysis by Maan-whitney U-test. P values were considered to be statistically significant (p < 0.0005).

Table 1 shows the comparison between values of Alkaline Phosphatase in group 1 (without periodontitis) and group 2 (with periodontitis). The mean rank for periodontitis group was 27.98 and for group 1 (without periodontitis) is 13.02. The results obtained were highly statistically significant with p-value <0.0001.

Fig-1 shows the comparison between range and median of group 1(without periodontitis) and group 2 (with periodontitis). The results obtained were highly statistically significant with p-value <0.0001.

Discussion:
The processes responsible for destruction of human periodontium are highly complex and vast range of biological substances are involved. In the periodontium, ALP is very important enzyme as it is part of normal turnover of periodontal ligament, root cementum and maintenance, and bone homeostasis. Hence ALP plays a major role in bone metabolism. The present study was done to evaluate the effect of Alkaline Phosphatase on postmenopausal women. Data of our study suggested that the mean rank of ALP in group 1 (without periodontitis) was 13.02 and that of group 2 (with periodontitis) 27.98.

The comparison of these two groups shows highly significant results. This may be attributed to the fact that Periodontitis is a chronic destructive periodontal disease

Keywords : Alkaline phosphatise, Periodontitis. - Sheehan R. D‘ Souza
which leads to resorption and destruction of alveolar bone, as a consequences of resorption, breakdown products are released in the periodontal tissue, which migrate towards the gingival sulcus and gather in whole saliva. It is also a known fact that fluctuations of sex hormones during menopause have been implicated as factors in inflammatory changes in the human gingival.

Hence the high level of ALP levels in saliva in our study (Group 2) may be due to increase in inflammation and bone turnover rates as ALP is produced by Osteoblasts, macrophages, PMNs, fibroblast, and plaque bacteria within periodontal tissues. The activity of ALP enzyme is mainly recorded in gingival crevicular fluid but technique of collecting GCF is very complicated, hence we selected saliva as its procedure of sampling is easier and comfortable for patients.

Our study is in accordance with the study done by S. Desai who concluded that there is a significant positive correlation between clinical parameters and ALP concentrations on saliva. Study done by Ozlem Daltaban in postmenopausal women showed a positive statistical correlation between total ALP levels and probing depth.

**Conclusion:**

In this present study it was found out that Alkaline Phosphatase levels are increased in Postmenopausal women with Periodontitis. As there are various hormonal changes in postmenopausal women and numerous etiological factors causing Periodontitis, ALP aggravates the bone loss. Hence periodontitis can progress rapidly. However ALP cannot be solely responsible for Periodontitis but it can be used as a additional aid in diagnosing Periodontitis. Hence Alkaline phosphatase can be used as a diagnostic marker of periodontitis in postmenopausal women. However further studies with larger sample size are required to conclude the exact role of Alkaline Phosphatase.

**Table - 1**: In table no. 1 comparison between values of Alkaline Phosphatase in group 1 (without periodontits) and group 2 (with periodontitis) is mentioned.

<table>
<thead>
<tr>
<th>GROUP</th>
<th>n</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>Z</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>VALUES</td>
<td>1</td>
<td>20</td>
<td>13.02</td>
<td>260.50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>20</td>
<td>27.98</td>
<td>559.50</td>
<td>-4.044</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>40</td>
<td></td>
<td></td>
<td></td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

The p-value obtained in this table is <0.0001. Hence the results obtained are highly statistically significant.

**Figure 1**: In table no.2 comparison between range and median of group 1 (without periodontitis) and group 2 (with periodontitis) is mentioned.

The p value mentioned in this table is <0.0001. Hence the results obtained are highly significant.

**References:**

Short Communication

CHELOSCOPY-A UNIQUE FORENSIC TOOL

Sharma S.M.¹, Krishnan Shalini ² & Anchan Akshari ³
¹Professor & HOD, ²Assistant Professor, Department of Oral & Maxillofacial Surgery, ³Junior resident, A.B. Shetty Memorial Institute of Dental Sciences, Nitte University, Deralakatte, Mangalore - 575 018, India

Correspondence :
S.M. Sharma
Professor and HOD, Department of Maxillofacial Surgery, A.B. Shetty Memorial Institute of Dental Sciences
Nitte University, Deralakatte, Mangalore - 575 018
Mobile : +91 98453 48515     E-mail : drsharma.sm@gmail.com

Abstract:
Identity is a characteristic that is unique to every individual. It is an important factor in cases of theft, criminal investigations of the dead or missing, mass disasters both by natural causes and by criminal intent – with this as our day to day reality, the establishment and verification of human identity has become extremely important. DNA and fingerprints are clearly the favored methods of identification, but, they require a prior record and verifiable baseline for comparison. When these tools cannot be used it is necessary to employ those biological factors with higher variation and lower diagnostic probability. Chelioscopy is one among them.

Keywords : Cheilioscopy, forensic odontology, lip prints

Introduction:

Every person is born with certain bodily features that makes him unique and one of a kind. For a long time forensics have been using Fingerprints, DNA and Retina Pattern for identification of a person. With advancement in technology many innovations have come across for the help of forensics. The external surface of the lip has many elevations and depressions forming a characteristic pattern called lip prints, which are unique to an individual like finger prints.

Identity is the establishment of a person’s individuality which is a set of physical characteristics, functional or psychic, normal or pathological. Identification of an individual is a pre-requisite for certification of death and for personal, social and legal reasons. Establishing this identity is a challenging task.

Traditional methods of personal identification include anthropology, dactyloscopy, DNA fingerprinting, sex determination, estimation of age, measurement of height, post mortem reports and differentiation by blood groups. Although lip print identification has been utilized in court in isolated cases, more research needs to be conducted in this field.

In a crime scene investigation, lip prints can link a subject to a specific location if found on clothes or other objects, such as glasses, cups or even cigarette butts. Lip prints in the form of lipstick smears are frequently encountered in forensic science laboratories as one of the most important forms of transfer evidence.

Lip prints are unique and do not change during the life of a person. The lip prints undergo alterations with minor trauma, inflammation and diseases like herpes, following which it recovers. The form of furrows does not vary with environmental factors. However, major trauma to the lips may lead to scarring, pathosis, and the surgical treatment rendered to correct the pathosis may affect the size and shape of the lip, thereby altering the pattern and morphology of grooves.

Analyzing the variations in lip patterns among the two genders will aid in forensic investigation and also standardize gender identification. Lip print recording is helpful in forensic investigation that deals with humans, based on lip traces. A lip print may be revealed as a surface with visible elements of lines representing the furrows. This characteristic pattern helps to identify the individuals
since it is unique for each and every individual excluding identical twin. When the lines are not clear (Only the shape of printed, individual identification of human beings based on the trace is extremely difficult unless the trace contains more individual characteristics like scars, clefts etc, and often identification ends with group identification\(^1\).

Lip prints are genotypically determined and are unique and stable. At the site of crime, lip prints can either be visible or latent\(^2\). Traditional lipsticks produce a lip print that can be easily studied that is visible lip print. Lipstick is an easily available and cost effective. It is thus used for the study. Prints obtained from non lipstick coated lips are considered latent prints. In criminal identification, latent prints are considered the key in solving a crime. It has been documented that these latent lip prints could be developed successfully for study purpose using various dyes. Also, lip prints can be used as a DNA source because epithelial cells could be retrieved from the print, so as to double its identifying value\(^5,6\). The lip prints of parents and children and those of siblings have shown some similarities. Variations in the lip patterns are seen among males and females and this has been used in determination of the sex of the individual.\(^7\).

**Aims and Objectives:**
To study the lip patterns, it’s role as an indicator of sex of an individual and to identify the variations and the most common lip patterns in two population groups.

**Materials:**
Simple bond paper and Lipstick

**Methodology:**
This study was carried out in the department of Oral and Maxillofacial Surgery, A. B. Shetty Memorial Institute Of Dental Sciences, Mangalore.

The study involved two researchers. Researcher-1 took the lip prints and recorded the patient details and researcher-2 analyzed and interpreted the imprints. This was done to avoid bias. Lip prints were taken by applying lipstick evenly to the vermilion border of the subject with a single stroke. The patient was then asked to rub both the lips to spread the applied lipstick evenly. The lip prints were then obtained on a simple bond paper, and were coded based on the name and sex of the individuals.

**Sample Size:**
The study involved 100 patients reporting to the department. They were selected randomly after obtaining a written informed consent. The participants were divided into 2 groups of 50 each. Group A-those hailing from North Kerala and Group B- those hailing from South Canara. Each group comprised of 25 males and 25 females. Each subject will be given a code number to hide the actual sex from the analyzer.

All the lip prints were compiled, analyzed and interpreted by researcher-2, using Suzuki’s classification, to study the variations in the lip prints in the two population groups. The data was then subjected to statistical analysis.

**Statistical Analysis:**
The data was compiled and analyzed using the Chi-square test.

**Results:**
The following conclusions were arrived at;

The most common lip prints in the individuals hailing from North Kerala as well as South Canara is the branching ‘y’ pattern. Therefore, this indicates that lip prints do not vary according to the geographical location.

When the lip is divided into four quadrants symmetrically, in males, only two opposite quadrants show similar grooves whereas in females at least three quadrants show similar pattern of grooves. This can be used as a major property in the indication of sex of an individual.

A new pattern of grooves which comprises of the mixed type of ‘branching y’ along with ‘complete vertical fissure’ was observed. This is an addition to the existing Suzuki’s classification

Thus, we conclude that along with other traditional methods, Cheiloscopy can also serve as a very important tool in the identification of a person, based on the characteristic arrangement of lines in the red part of the lip

**Keywords:** Cheiloscopy, forensic odontology, lip prints

- S.M. Sharma
### Future Directions:

Although used in a few selected cases. More research is required for increasingly simpler, more sensitive and effective methods of sample collection and standardizing the techniques.

### Acknowledgements:

We humbly thank ICMR for granting studentship and accepting the study, A.B. Shetty Memorial institute Of Dental Sciences in general and also Dr. Ramanand Shetty-Vice Chancellor, Nitte University, for the encouragement in carrying on the study.

### References:


### Table:

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<th>Diagnosed Wrong</th>
<th>P-Value</th>
<th>R²</th>
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<td>3</td>
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<tr>
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<td></td>
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<tr>
<td>Total</td>
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### Figures:

- **Fig. 1 - TYPE 1**
- **Fig. 2 - TYPE 2**
- **Fig. 3 - TYPE 3**
- **Fig. 4 - TYPE 4**


ANATOMICAL STUDY OF THE MODERATOR BAND

Raghavendra A.Y.1, Kavitha2, Arunachalam Kumar2, Pratik Tarvadi3 & Harsha C.R.4

1Assistant Professor, 2Lecturer, 3Professor, 4Assistant Professor, 5P G Student
1-4 Department of Anatomy, 5Department of Forensic Medicine,
K.S. Hegde Medical Academy, Nitte University, Deralakatte, Mangalore - 575 018, India

Correspondence:
Raghavendra A.Y.
Department of Anatomy,  K.S. Hegde Medical Academy, Nitte University, Deralakatte, Mangalore - 575 018, India.
Mobile : +91 99721 34242, E-mail : raghav4n72@gmail.com

Abstract:
Moderator band is a muscular trabecula which extends from interventricular septal wall to the base of anterior papillary muscle in right ventricle of heart. This study was conducted on 20 hearts from adult human cadavers. Out of 20 specimens of heart we could observe the presence of moderator band in 17 and in rest 3 it was not visible for record. Origin length, thickness and distance from tricuspid valve were noted. The average length of the moderator band was 13.82cm with the SD of 3.94 and the average thickness being 4.46cm with the SD of 1.36. The average distance from tricuspid valve was 3.6cm with the SD of 1.01. As the moderator bands, or other large trabeculations, can be major obstacle for the repair of apical ventricular septal defects, the morphometric study of moderator band may help the surgeons during surgical procedures conducted for correction of such defects.

Keywords: Moderator band, ventricular septal defects, septomarginal trabecula, morphometry.

Introduction:
A muscular band, well-marked in sheep and some other animals, frequently extends from the base of the anterior papillary muscle to the ventricular septum. From its attachments it may assist in preventing over distension of the ventricle, and so has been named the moderator band.1

The moderator band, another marker for the morphologically right ventricle, takes off from the body of the ventricular septum to cross to the parietal wall carrying within it a fascicle of the right bundle branch of the atroioventricular conduction system.2

A large branch from the left anterior descending artery passes along the length of the moderator band in the right ventricle. This artery, which measured up to 1000 .u in diameter in hearts with prominent moderator bands, may constitute an important part of the supply of the anterior papillary muscle of the right ventricle.3 Any damage to moderator band might cause ischemia of distal structure.

The moderator band, or other large trabeculations, is the major obstacle for the repair of apical ventricular septal defects.4 The morphometric study of moderator band may help the surgeons during surgical procedures conducted for correction of such defects.

Materials and Methods:
This study was conducted on 20 hearts from adult human cadavers in the department of anatomy, K. S. Hegde medical college, Mangalore. The hearts were fixed and kept in a 10% formalin solution. The sternocostal surface was dissected with one incision parallel to anterior interventricular sulcus and another parallel to right half of inferior margin about half an inch above. Anterior wall was pulled carefully to right to visualize inside of right ventricle. The septomarginal trabecula was exposed.

The septomarginal trabecula was identified as a fleshy band extending from inter-ventricular septum to the base of anterior papillary muscle. The length was measured from the papillary end to the septal end with the help of digital Vernier caliper. Thickness was measured at its approximate middle portion. An approximate distance of the septal end of septomarginal trabecula to the tricuspid valvular margin was measured.
Observations and Discussion:

Table 1: Morphometry of moderator band

<table>
<thead>
<tr>
<th>Specimen no</th>
<th>Length (mm)</th>
<th>Thickness (mm)</th>
<th>Distance from tricuspid valve (cm)</th>
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<tr>
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<td>20.5</td>
<td>4.4</td>
<td>3.6</td>
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<td>2</td>
<td>17.6</td>
<td>4.9</td>
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<td>3</td>
<td>9.7</td>
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<td>15.8</td>
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<td>6</td>
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<tr>
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<td>Mean</td>
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<td>SD</td>
<td>3.943485</td>
<td>1.363218</td>
<td>1.016735</td>
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</table>

The septomarginal trabecula was a common structure, originating from the muscle of the interventricular septum. This muscular band deriving from the lower segment of crista supraventricularis was, in most cases, visibly separated from the surface of the interventricular septum.

Out of 20 specimens of heart we could observe the presence of moderator band in 17 and in rest 3 it was not visible for record.

In the present study out of 17 specimens the moderator band was separate from the muscular wall in 14, in another three it was found to be tethered to the muscular wall as in specimen no.15. A thin sheet of plastic could not be inserted between the wall and the band.

In as many as 14 specimens moderator band was arising from the lower segment of crista supraventricularis. The septomarginal trabecula was a common structure, originating from the muscle of the interventricular septum. This muscular band deriving from the lower segment of crista supraventricularis was, in most cases, visibly separated from the surface of the interventricular septum.

Single connection with anterior papillary muscle was found in only three specimens as seen in specimen no.9. In rest of the specimen it showed multiple connections (specimen no.13).

Prominent septal portions were seen in 11 specimens as in specimen no.4. In all other specimens the papillary portion was muscular thick and prominent as in specimen no.9. In two specimens we could see a thin slender moderator band with prominent papillary portion as seen in specimen 8 and 15. These observations are in accordance with the observations made by Depreux et al. who investigated 100 hearts from several mammals and, based on observations and measurements, classified three types of trabecula: I — muscular and thick, II — fibrous and thin, and III fibromuscular.

Septoparietal trabeculations were found extending from the anterior margin of the septomarginal trabeculation to the parietal wall in 5 specimens as seen in specimen no.13. In many other specimens there were multiple minor trabeculations extending from moderator band.

Carlos Alva et al also observed that along with these major septoparietal trabeculations, multiple minor trabeculations extended to the apex, creating complex but variable patterns of trabeculations within the apical component of the right ventricle.

The above observations correlate with the observations made by S.T.F. Bandeira et al who classified the septomarginal trabecula into eight groups.

The average length of the moderator band was 13.82 cm with the SD of 3.94 and the average thickness being 4.46 cm with the SD of 1.36. The average distance from tricuspid valve was 3.6 cm with the SD of 1.016735. According to Carlos Alva et al who studied the 10 normal hearts, the moderator band took origin at a mean ratio of 0.48 (SD 0.16) of the ventricular length. Also, observed the mean distance from the pulmonary valve to the origin of the moderator band, or to the most prominent septoparietal trabeculation in the 2 hearts without a moderator band.

Keywords: Moderator band, ventricular septal defects, septomarginal trabecula, morphometry. - Raghavendra A.Y.
According to P. Parto et al., the macroscopic and microscopic studies revealed that the moderator bands are found in different positions in the right and left ventricles in the ostrich heart. In the right ventricle, there is one musculo-tendinous moderator band about the base of the ventricle, which extends from the interventricular septum to the muscular stalk of the muscular valve. It was single and sometimes branched.

Similarly, Camila Ribeiro Leao et al. observed septomarginal trabeculations extending from the anterior margin of the septomarginal trabeculation.
trabecula in goats consisting of a third order fleshy trabecula that was present in 69% of the specimens\textsuperscript{10}. The apical and septoparietal trabeculations were much coarser in the right ventricle of the pig compared with man.\textsuperscript{11}

According to F. Bojsen-moller and J. Tranum-jensen “The right bundle branch of the conducting system in 19 pig hearts was traced through part of the interventricular septum and through the moderator band as far as the base of the anterior papillary muscle”.\textsuperscript{12}

The interventricular septum is formed by the fusion of three structures. The primary fold at the apex of the heart progresses proximally, becoming the trabecular portion of the interventricular septum. The inlet septum arises posteroinferiorly and fuses with the trabecular portion, forming the septomarginal trabecula (moderator band). The infundibular septum arises from the downward extension of the conal ridge. The conal ridge fuses with the endocardial cushions to form the membranous portion of the interventricular septum. So the developmental morphology of moderator band might help in understanding and surgical corrections of the defects pertaining to interventricular septum.

References:
PREVALENCE AND RISK FACTORS OF UNDER NUTRITION AMONG UNDER FIVE CHILDREN IN A RURAL COMMUNITY

Shreyaswi Sathyanath M.¹, Rashmi² & N. Udaya Kiran³
¹Post Graduate, ²Associate Professor, ³Professor & HOD, Department of Community Medicine, K.S. Hegde Medical Academy, Nitte University, Deralakatte, Mangalore - 575 018

Correspondence
Shreyaswi Sathyanath M.,
Post Graduate, Department of Community Medicine, K.S. Hegde Medical Academy, Nitte University, Deralakatte, Mangalore - 575 018
E-mail : dr_siya87@yahoo.co.in

Abstract:
Children of today are citizens of tomorrow; the young child under 5 years is most vulnerable to the vicious cycles of malnutrition, infection and disability all of which influence the present condition of a child and the future human resource development of the nation as a whole. Hence the assessment of the ground reality as reflected by the statistics on nutritional status of children becomes very significant in this context.

The study was done to determine the prevalence of under-5 under nutrition and to identify the major child factors contributing to the development of under nutrition among the under 5 children.

This was a cross sectional study conducted in the rural community of Nitte, a field practice area of Department of Community medicine, K S Hegde Medical Academy among all the children of the anganwadis under ICDS scheme. A total of 133 under 5 children were assessed for their nutritional status and the factors that affect nutritional status.

The overall prevalence of under-5 under nutrition was found to be high at 63.16%. More girls were undernourished compared to boys, lower grades of undernourishment were more common and the prevalence of under nutrition increased with increasing age.

There was a higher prevalence of underweight in children born with low birth weight, born premature, those children not exclusively breast fed and on improper complementary feeds. Immunization and Vitamin A supplementation of the under-5 children status was highly satisfactory.

Keywords: Under nutrition, under-5 children, ICDS

Introduction:
Early childhood, that is the first six years constitutes the most crucial period in life, when the foundations are laid for cognitive, social and emotional language, physical/motor development and cumulative lifelong learning [1].

Childhood under nutrition is a critical public health and development challenge in many developing countries including ours [2]. An estimated forty per cent of the world’s severely malnourished under-5 children live in India [3] and one in every three malnourished child in the world lives in India [4]. Under nutrition encompasses stunting (chronic under nutrition), wasting (acute under nutrition) and deficiencies of micronutrients (essential vitamins and minerals). The level of child under nutrition is unacceptably high in almost all states, except some like Goa, Kerala, Manipur, Mizoram, Punjab and Sikkim. More than 6,000 Indian children below the age of five die every day due to malnourishment or lack of basic micronutrients such as vitamin A, iron, iodine, zinc or folic acid.

The causes and impact of childhood under nutrition are complex and manifold. An individual will experience under nutrition if the appropriate amount or quality of nutrients is not consumed for an extended period of time. The problem is multifaceted, the causes acting singly or in combination with other complex factors like poverty, purchasing power, health care, ignorance on nutrition and
health education, female illiteracy, social convention etc. Besides being associated with high rates of mortality and morbidity, it is also an underlying factor in almost one-third to half of all under five deaths due to preventable causes.

A failure to combat child malnutrition reduces potential economic growth at the macro level. At the micro level, malnutrition both protein energy malnutrition and micronutrient deficiencies directly affects children’s physical and cognitive growth and increases susceptibility to infection and diseases with frequent episodes of illness and longer recovery period ending up in growth retardation and poor cognitive development. Long term impact on education attainment may occur in correlation with stunting and iron deficiency anaemia. Without adequate care, such children also fail to reach their full potential due to irreversible effects beyond the first two years of life.

Some of the terms used to denote under nutrition include underweight, stunting and wasting which are measured by anthropometry. The percentage of children below 5 years classified as malnourished according to these three anthropometric indices of nutritional status in India as revealed by NFHS 3 (2005-06) is indicative of the significant malnourishment among Indian children. According to NFHS survey, 43 percent children under age of five years are underweight (low weight for age), 48 percent children under five are stunted (low height for age). 20 percent children under five years of age are wasted (low weight for height). 20 percent children under five years of age are wasted (low weight for height). Over 6 per cent of these belong to a category called Severe Acute Under nutrition or SAM (<-3SD).

The present study was undertaken to study the prevalence of under five under nutrition and to identify the major child factors contributing to the development of under nutrition among the under 5 children.

Material and Methods:
A cross sectional community based study was done in rural community of Nitte with universal sampling of all the anganwadis during the time period of August to September 2012.

Sample size was determined to be 200 with formula \(4pq/L^2\) taking the prevalence of underweight as 15% and allowable error of 5% \((p=15, q=100-15\) and \(L=5\)).

We determined to survey all anganwadis in and around Nitte and recruit all the children for the study, but due to various logistic reasons like rainy season and various festivals during the study period, attendance in Anganwadi was very low, hence we could get a sample only of 133 under-5 children.

The anganwadis were visited and the mothers of the children were asked to come on a particular day and the anganwadis were revisited on that day; the study was undertaken with informed consent of the parents. Pre tested proforma with face validity and linguistic validation were used to identify the child factors like birth weight, breast feeding, complementary feeding, maturity status at birth, immunization and vitamin A supplementation. Children were examined for weight, height, mid arm circumference, head circumference and chest circumference.

Under nutrition is defined as underweight (weight for age < 2 SD), wasting (weight for height < 2 SD) and stunting (height for age < 2 SD) as per national guidelines. Weight-for-age is a composite index of height-for-age and weight-for-height and has been used to measure under nutrition in the present study and the grades of under nutrition here were defined as per IAP classification.

Results:
A total of 133 under-5 children were surveyed of which a majority of 84 children were undernourished (63.16%). Out of the survey population, 77 (57.89%) were girls and 56 (42.01%) were boys. 55 girls (71.43%) and 29 (51.8%) of boys were undernourished, showing a higher prevalence in girls as compared to boys. Majority of the undernourished were females (65.47%). 57 out of 133 children had grade 1 under nutrition. There was a higher prevalence of grade 1 under nutrition (42.8%) compared to grade 2 (18.7%) and grade 3 under nutrition (1.5%). Majority with 40 (47.6%) of the undernourished
children belonged to 4-5 yrs age group and the prevalence of under nutrition increased as the age increased above 1 year age with the maximum prevalence of 68.9% seen in 4-5 year age group. However infants had a higher prevalence of under nutrition at 66.7%.

Majority (109 under-5, 81.95%) of the surveyed under-5 children were born with normal birth weight (>2.5 kgs). The prevalence of under nutrition was higher among the children born with low birth weight with 18 (75%) being undernourished among the low birth weight compared to 66 (60.6%) of 109 normal birth weight children.

A majority of 122 (91.72%) children among the survey population were born mature or term while 11(8.3%) were born premature. The prevalence of under nutrition was higher among those born premature at 72.7% as compared to those born mature at 62.3%, grades 2 and 3 was more common among premature but this difference was not seen in case of grade 1 malnutrition.

Out of the 133, a majority of 114 (85.7%) children had been exclusively breast fed. The proportion of under nutrition was almost similar in the two categories with 62.3% of exclusively breast fed and 68.4% of the children not exclusively breast fed being undernourished.

Among the children who have been weaned, under nutrition was found to be more prevalent amongst children who are fed only rice as complimentary feed (percentage difference of 18%) and lesser among those who are given mixed feed (4%) while no difference was found between normal or malnourished children fed with cerelac based feeds.

100% of the surveyed children were immunized for age and received adequate vitamin A supplementation.

<table>
<thead>
<tr>
<th>Table 1: Distribution of under nutrition according to gender and birth weight</th>
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<tr>
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</tr>
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<td>&gt;2.5kgs</td>
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<td>Grade of under-nutrition</td>
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<td>2</td>
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<th>Table 3: Distribution of under nutrition according to maturity at birth and breast feeding practices</th>
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</tr>
<tr>
<td>Mature</td>
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<td>54 (44.26%)</td>
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<tr>
<td>47 (41.23%)</td>
<td>22 (19.29%)</td>
<td>2 (1.75%)</td>
</tr>
<tr>
<td>Not exclusively breast fed</td>
<td>10 (52.6%)</td>
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<tr>
<td>total</td>
<td>57 (42.85%)</td>
<td>25 (18.79%)</td>
</tr>
</tbody>
</table>

Keywords: Under nutrition, under-5 children, ICDS

Shreyaswi Sathyanath M.
Discussion:

The Integrated Childhood Development scheme (ICDS) developed with the concept of providing a package of services is based primarily on the consideration that the overall impact will be much larger if the different services develop in an integrated manner as the efficacy of a particular service depends upon the support it receives from related services delivered through public health infrastructure mainly in the anganwadi centres under the Ministry of Health & Family Welfare. This is at present India’s response to the challenge of breaking the vicious cycle of malnutrition, morbidity, reduced learning capacity and mortality. Services include supplementary feeding and growth monitoring; and prophylaxis against vitamin A deficiency, Immunization, Referral Services and Non-formal Pre-School Education. The present study has focussed on under 5 children in such anganwadi centres and thereby strives to study the impact of ICDS services in the rural community.

The present study found the prevalence of under 5 under nutrition (underweight) to be 63.16% which is comparable to another study \(^5\) done in rural Bangalore by Bobby Joseph et al among 256 rural children aged 12-60 months which found that about 70% of the children were malnourished (wasting, stunting, or both) but much higher than the state average of 37.6% for under-3 \(^8\) and the national average of 43%. This could be due to the fact that the present study was restricted to a rural area wherein majority of the households belonged to classes 2, 3 and 4 socioeconomic status according to modified Kuppuswamy scale and a direct relationship between poverty or low socio economic status and under nutrition is well known. It also could be because malnourished were asked to come to the anganwadi and were more likely to be present as compared to normal children who missed due to it being rainy season.

A house to house cross sectional survey \(^7\) in rural UP by H S Joshi et al found the overall occurrence of PEM in under 6 years children to be 49.44% which is slightly lower than the present study, however it was found to be significantly higher (64.87%) in the age group of 3-6 years which corroborates with our study which also showed higher prevalence in higher age groups. The proportion of grade I, II, III and IV of under nutrition observed was 45.49%, 38.30%, 14.86 and 1.35% respectively. Prevalence of under nutrition was 39.92 % (99 out of 248) in males and 61.19% (123 out of 201) in females. The pattern of severity of malnutrition and gender distribution is similar to our study. The gender difference in under nutrition with females having higher prevalence has been found in several other studies both at regional \(^8, 9, 10\) \(^1\) and national levels \(^1\).

Age distribution of under nutrition in the present study shows that the prevalence increases with increasing age but with a significant higher prevalence in infancy. This is similar to some other studies \(^8\) but contrasts with yet some studies \(^12\) which show low proportion of underweight among infants. This may be due to other confounding factors in infancy like birth weight and other environmental factors.

Our study showed higher proportion of underweight among low birth weight (though associations have not been explored) and improper rice based complementary feeds. This is similar to a study \(^9\) done in 4 selected anganwadi areas in UP by Dinesh kumar et al which found that improper complementary feeding is a significant (P<0.05) risk factor for underweight. However exclusive breast-feeding was not found a significant correlate of nutritional status in the study. However in contrast to our study the proportion of underweight was lower at 36.4%
and the maximum proportion of underweight (45.5%) occurred among children aged 13-24 months. In the present study exclusive breastfeeding for the first 6 months was done in a majority of 85.7% children which is higher than the Karnataka statistical average of 59% and majority of the children who were not exclusively breast fed were undernourished similar to earlier studies.

The present study showed 100% immunization for age of the under 5 children surveyed, much higher than the national average of 61% among children aged 12-23 months, higher than the coverage of full immunization in Karnataka of 78% and higher than 55% of 12-23 months aged children that are fully vaccinated against six major childhood illnesses in Karnataka. 100% of under 5 children in the present study have received vitamin A supplementation which again is higher than the state average of 23 percent of last-born children age 12-35 months, and 53 percent of children age 6-35 months. These may be attributed to the higher female education status in Dakshina Kannada and Udupi districts.

The prevalence of low birth weight in the present study (18.1%) is almost similar to the national average of 22.5% as estimated by NFHS 3, and prevalence of undernutrition was more common among those born with low birth weight similar to other studies.

Some of the limitations of the study are that we have not explored maternal factors like maternal BMI and antenatal care, socio demographic factors and other environmental factors which also play significant role in childhood under nutrition. Because of logistic reasons, we could not meet the adequate sample size.

**Conclusion:**
Prevalence of under nutrition is higher than the state average in spite of low birth weight prevalence being comparable to that of the state, high female education status with 100% immunisation and higher proportion of exclusive breast feeding. We thus attribute the major factor leading to under nutrition as defective complementary feeding. Hence we recommend proper maternal education on the right time of initiation and the right type of complementary feeds.

**Acknowledgements:**
I acknowledge the interns who helped me in the data collection (Dr Jazeela B. R, Dr Dipthi N, Dr Dipti K) and the anganwadi workers for their kind cooperation.

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SHORT COMMUNICATION

EFFECTIVENESS OF CARDIOTOCOGRAPHY TRAINING PROGRAMME ON KNOWLEDGE AND SKILL AMONG NURSES WORKING IN MATERNITY UNITS

Sowmya M.N.¹, Gayathri Priya², Ramesh C.³ & Jothi K.⁴

¹ 2 year M.Sc. (N) Student (2011-2012), ¹ Reader, Sri Ramachandra College of Nursing, Sri Ramachandra University, Porur, Chennai, India, ³ Assistant Professor, ³ Lecturer, Noor College of Nursing, Bengaluru, Karnataka, India

Correspondence:
Gayathri Priya
Reader, Sri Ramachandra College of Nursing, Sri Ramachandra University, Porur, Chennai, India.
E-Mail: dr.gayathripriya@rediffmail.com

Abstract:
The study was conducted to assess the effectiveness of Cardiotocography Training Programme on knowledge and skill among nurses working in the maternity units. An evaluative approach of pre experimental one group pretest – posttest research design was used. The present study was conducted in Sri Ramachandra Hospital, Chennai, India among 30 nurses working in the maternity units who satisfied the inclusion criteria. The samples were selected using convenient sampling technique. Cardiotocography Training Programme (CTP) was given after assessing the level of knowledge and skill in cardiotocography by pretest, followed by posttest on 7th day. The collected data were analyzed using descriptive and inferential statistics. A significant difference was found between pretest and posttest in level of knowledge and skill (P<0.001). The study findings showed that Cardiotocography Training Programme (CTP) were effective in increasing the knowledge and skill among nurses. There was no association found between level of knowledge and skill with demographic variables.

Keywords: Cardiotocography Training Programme (CTP), Knowledge, Skill, Nurses.

Introduction:
Pregnancy is a wonderful, normal experience, which is a part of the cycle of every woman’s life. It is a miracle that occurs by the union of two microscopic entities – an ovum and a sperm – that can produce a living being. The health of the fetus and the health of the mother are extensively linked with each other and thus midwife plays a major role in attaining this goal throughout pregnancy to till the time of delivery. The goal of perinatal nursing is to facilitate maximum physical and emotional well-being for the mother and her fetus.

Care given during the intrapartum period is the 'cornerstone of midwifery practice' which would help pregnant and labour gives an impression of the fetal well-being or fetal compromise thereby promoting the newborn’s health status after birth. The past few decades have shown a notable increase in the number of techniques used to assess fetal well being that ranges from the relatively simple maternal assessment of fetal movement to more complex diagnostic tests guided by the ultrasound. One such technology developed is cardiotocography.

The cardiotocograph (CTG) measures the fetal heart rate and uterine contractions simultaneously which was developed by Dr. Koran Hammacher in collaboration with Hewlett Pakard in the 1960’s. Continuous electronic fetal monitoring (EFM) came into widespread in clinical use during 1970s to monitor fetal well-being during labour (Wheble et al, 1989). A CTG is an external electronic fetal monitoring system which records the fetal heart rate (cardio) through a transducer fixed on the mother’s abdomen and the uterine contractions (toco) through the transducer placed at the fundus.

Keywords: Cardiotocography Training Programme (CTP), Knowledge, Skill, Nurses.
Cardiotocography training mainly aims at preparing the nurse midwife to understand the tracings that projects fetal condition during antenatal and labour period thereby identifying the complications at the most earliest which in turn helps to reduce the perinatal mortality and morbidity.

**Need for the study**

The major cause of perinatal mortality is inadequate monitoring and care during labour by the skilled health professional. According to WHO (2011), perinatal deaths has decreased from 4.6 million in 1990 to 3.3 million in 2010 (%). It is identified that 99% of the perinatal mortality occurs in the developing country, out of which India has more than half of the deaths that accounts for about more than 9,00,000 newborn deaths per year (28% of the global total). The maternity health service plays a vital role in reducing the perinatal mortality rate. Nurses are those professionals who spend a lot of time with the mother during labour, hence nurses need to be competent enough to perform and interpret the tracings correctly and timely inorder to promote the measures in reducing the fetal death.

It was suggested that midwife is expected to be adequately trained in CTG use, interpretation and regularly to update their knowledge and skill to render quality care (Andrew Symon, 2007).

Barrett Robinson (2008) insisted the interpreter to familiarize with the standardized, quantitative nomenclature recommended to describe intrapartum cardiotocography inorder to reduce miscommunication among providers while caring the laboring mother.

Pehrson, Sorensen and Amer Wahlin, (2011) found that CTG training programmes increases the level of knowledge, interpretive skills, higher interobserver agreement, better management of intrapartum CTG and improved quality of care with computer based training (CBT).

Cardiotocography Training Programmes are conducted worldwide especially in abroad as an in-service or continuing nursing education programme, but not much flourished in India to empower the nurse midwife to be competent enough in cardiotocography interpretation. As nursing profession has an array of expanded roles which mainly includes independent nurse practitioner, certified nurse midwife and so on, it is compulsory to have a profound knowledge regarding cardiotocography interpretation. Hence the investigator got motivated to perform a training programme on cardiotocography with a view to promote knowledge and skill among nurses on cardiotocography and to evaluate its effectiveness.

**Statement of the Problem**

A study to assess the effectiveness of Cardiotocography Training Programme on knowledge and skill among nurses working in maternity units at Sri Ramachandra Hospital, Chennai

**Objectives of the study**

- Evaluate the effectiveness of cardiotocography training programme on knowledge among nurses.
- Determine the effectiveness of cardiotocography training programme on skill among nurses.
- Identify the relationship between knowledge and skill on cardiotocography among nurses.
- Associate the level of knowledge and skill on cardiotocography with selected demographic variables of nurses.

**Review of literature**

An exploratory descriptive design was conducted to examine the attitude of midwives and doctors towards the use of CTG machine in labour ward maternity unit in Northern Ireland. The participants were 56 midwives and 19 doctors out of which 6 midwives and 2 doctors were randomly selected. Tool to measure the attitude and a follow-up semi-structured interview with doctors and midwives were administered. About 72.5% (n=29) viewed CTG technology positively and 87.5% (n=25) assured confidence about their skill in interpreting CTG tracings. Majority of the respondents (60%, n=24) felt that adequate training prepared them for using CTGs. Thus the study addressed regarding the training needs of qualified staff and regular updates in improving their knowledge and confidence level.

**Keywords:** Cardiotocography Training Programme (CTP), Knowledge, Skill, Nurses. - Gayathri Priya
A descriptive study was conducted on the interpretation of CTG among midwives. About 4021 traces recorded, 764 were high risk pregnant mothers out of 2674 (67%) and 499 were apparent low risk mothers out of 1347 (34%). Questionnaires were sent to the midwives working in the peripheral units to evaluate the acquisition of knowledge, skill and level of satisfaction. It was found that most of the nurses had inadequate knowledge in CTG interpretation.

Systematic review of the 20 studies was conducted on describing and evaluating CTG training programmes which concluded that there is an increase in the level of knowledge and interpretive skills, higher interobserver agreement, better management of intrapartum CTG and improved quality of care with computer based training (CBT). The researcher also recommended training as it improves CTG competence and clinical practice. Also the researcher focused for further research on CBT, test-enhanced learning and long-term retention, evaluation of training and impact on clinical outcomes.

Materials and Methods:
Research design adopted for this study was pre experimental one group pretest – posttest design.

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest</th>
<th>Intervention</th>
<th>Posttest (7th day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study group</td>
<td>O₁</td>
<td>X</td>
<td>O₂</td>
</tr>
</tbody>
</table>

Key:
O₁: Pretest
X: Routine activities
O₂: Posttest on 7th day

Population:
Population of the study was nurses working in the maternity units (antenatal ward, labour room, postnatal and gynaecology ward) of Sri Ramachandra Hospital, Chennai.

Sample, Sample Size and Sampling technique
Sample of the study were nurses working in the maternity units (antenatal ward, labour room, postnatal and gynaecology ward) who satisfied the inclusion criteria. The sample size was thirty. The samples were selected using convenience sampling technique.

Data Collection Tool
Data collection tool were consisted of three sections
Section A – Demographic Variables
Section B – Structured questionnaire on Knowledge categorized under 3 headings
   I. General facts on cardiotocography and procedure (10 questions).
   II. Interpretation of cardiotocography (12 questions).
   III. Nurses role in CTG (8 questions).
Section C – Structured questionnaire on skill

Data Collection Process
Ethics committee for the student proposal, Sri Ramachandra University approved the conduction of the study. Permission was obtained from the Chairman, Nursing Education, Head of the Department, Obstetrics and Gynaecology, Sri Ramachandra University and written permission from the Medical Superintendent and Deputy Nursing Supervisor, Sri Ramachandra Hospital to conduct the study. The study group consisted of a total of 30 nurses, who met the inclusion criteria, as samples which were conveniently selected. The objective of the study was explained to each nurses and consent was obtained from them for participating in the study.

Statistical Analysis:
Descriptive statistics (frequency, percentage, mean, standard deviation) and inferential statistics (paired t-test, correlation and chi-square) were used to analyze the data and to test the hypothesis.

Keywords: Cardiotocography Training Programme (CTP), Knowledge, Skill, Nurses. - Gayathri Priya
Obtained informed consent

Convenience sampling technique

Study group (n = 30)

Pretest
• Demographic variables
• Questionnaire on knowledge
• Questionnaire on skill

Intervention
• Cardiotocography Training Programme (CTP).
  4 - 6 nurses
  30 minutes session for 2 consecutive days
• Routine in-service education programmes.

Posttest assessment of knowledge and skill on the 7th day among nurses.

Figure 2: Schematic representation of data collection procedure

Statistical Analysis:
Descriptive statistics (frequency, percentage, mean, standard deviation) and inferential statistics (paired t-test, correlation and chi-square) were used to analyze the data and to test the hypothesis.

Results:
1. Comparison of level of knowledge on general facts on cardiotocography and procedure, 36.7% had inadequate level of knowledge and 46.7% had moderately adequate level of knowledge in pretest, whereas in posttest 93.3% of the nurses had adequate level of knowledge.

2. Regarding the level of knowledge on interpretation of cardiotocography, 76.6% had inadequate level of knowledge in pretest, whereas 93.3% had adequate level of knowledge in the posttest.

3. Considering the knowledge level on nurses’ role in cardiotocography, 56.7% had inadequate level of knowledge in pretest whereas 66.7% had adequate level of knowledge in posttest.

4. Comparison of overall level of knowledge on cardiotocography showed 13 (43.3%) had inadequate and 17 (56.7%) nurses had moderately adequate level of knowledge in pretest whereas in posttest, 28 (93.3%) had adequate level of knowledge on cardiotocography.

5. The mean and SD of the knowledge regarding general facts on cardiotocography and procedure in pretest (mean: 6.07, SD: 1.780) and posttest (mean: 9.57, SD: 0.568) showed a significant change at the level of p < 0.001.

6. There was a significant difference in the level of knowledge on interpretation of cardiotocography with mean and SD of 5.47 (1.634) and 10.57 (0.679) in pretest and posttest which was significant at the level of p < 0.001.

7. There was a significant difference regarding the nurses’ role in cardiotocography with mean and SD of 3.97 (1.351) and 6.70 (0.915) in pretest and posttest which was statistically significant at the level of p < 0.001.

8. Majority (93.3%) of the nurses had inadequate level of skill in pretest whereas in posttest 83.3% had adequate level of skill in interpreting the cardiotocography tracings.

9. The mean and SD regarding the level of skill of nurses in interpreting the cardiotocography tracings showed a significant difference in pretest (mean: 5.20, SD: 1.324) and posttest (mean: 12.40, SD: 0.855) which was statistically significant at the level of p < 0.001.

10. There was a weak negative correlation (r = -0.059) between the level of knowledge and skill in pretest, whereas weak positive correlation (r=0.323) in posttest.

11. There was no significant association between
demographic variables with the level of knowledge and skill among staff nurses in pretest and posttest.

**Discussion:**
The study findings were discussed based on the objectives as follows: The first objective was to evaluate the effectiveness of cardiotocography training programme on knowledge among nurses. Regarding the level of knowledge on general facts on cardiotocography and procedure, around 11 (36.7%, mean: 6.07, SD: 1.780) nurses had inadequate level of knowledge in pretest whereas in posttest it was found to be increased to 28 (93.3%, mean: 9.57, SD: 0.568) with adequate level of knowledge with a high statistical significance of $p < 0.001$.

With respect to interpretation of cardiotocography, 23 (76.7%, mean: 5.47, SD: 1.634) had inadequate level of knowledge in pretest and in posttest it was further increased to 28 (93.3%, mean: 10.57, SD: 0.679) nurses with adequate level of knowledge which was statistically significant at the level of $p < 0.001$.

Considering the nurses' role in cardiotocography, around 17 (56.7%, mean: 3.97, SD: 1.351) nurses were found to have inadequate level of knowledge in pretest whereas in posttest, the level of knowledge was increased to adequate level by 66.7% among 20 nurses (mean: 6.70, SD: 0.915) which was statistically significant at the level of $p < 0.001$ respectively.

The overall level of knowledge on cardiotocography showed that 13 (43.3%) had inadequate and 17 (56.7%) had moderately adequate level of knowledge in pretest whereas in posttest 28 (93.3%) had found to have adequate level of knowledge on cardiotocography. This concluded that Cardiotocography Training Programme had a very high statistically significant effect on the level of knowledge among staff nurses with the level of $p < 0.001$.

The second objective was to determine the effectiveness of cardiotocography training programme on skill among nurses. It was found that majority of the nurses 28 (93.3%) had inadequate skill in pretest with a mean and standard deviation of 5.20 (1.324) in interpreting the cardiotocography tracings. While in posttest, 25 (83.3%) nurses had adequate skill in interpreting the cardiotocography tracings with a mean and standard deviation of 12.40 (0.855). The findings showed a high statistical significance at the level of $p < 0.001$. Thus this proved that Cardiotocography Training Programme had a high statistical significant effect on the level of skill in interpreting tracings among nurses.

The third objective was to identify the relationship between knowledge and skill on cardiotocography among nurses. The relationship between the level of knowledge and level of skill on cardiotocography among nurses was found using Pearson correlation ($r$). It was found that there was a weak negative correlation ($r = -0.059$) between knowledge and skill on cardiotocography among nurses in pretest whereas a weak positive correlation ($r = 0.323$) in posttest. This showed that Cardiotocography Training Programme (CTP) improved the level of knowledge and skill among nurses.

The fourth objective was to associate the level of knowledge and skill on cardiotocography with selected demographic variables of nurses. Association of the level of knowledge and skill with demographic variables among nurses on cardiotocography was done using chi-square test. The study results represented that there was no significant association between the level of knowledge and skill with selected demographic variables among nurses.

**Hypothesis:**
The stated hypothesis for the first objective that ‘There is a significant difference in knowledge of nurses before and after attending cardiotocography training programme than those who do not’ was accepted.

The stated hypothesis for the second objective ‘There is a significant difference in the skill of nurses before and after attending Cardiotocography Training Programme than those who do not’ was accepted.

**Conclusion:**
Monitoring the fetal heart rate with cardiotocograph machine is now very common in all the existing health care systems in the modern world. Nurse midwives are those personnel who spend a majority of their time along with...
the mother during her entire hospital stay. Thus nurses play a pivotal role in identifying both the maternal and the fetal complications early thereby reducing the maternal and fetal mortality and morbidity. For this adequate level of knowledge and high interpretative skills should be necessary for each nurse which can be incorporated through Cardiotocography Training Programme. Thus this study shows that Cardiotocography Training Programme (CTP) was very effective in improving the level of knowledge and skill among nurses working in the maternity unit.

**Recommendations:**
- This study can be done on larger samples.
- A similar study can be conducted among group as a follow-up after 3 months.
- A comparative study can be conducted between nurses in maternity units of different hospitals to assess the effectiveness of Cardiotocography Training Programme.
- A similar study can be conducted using random sampling method.
- A descriptive study can be conducted to assess the level of knowledge and skill on cardiotocography among nurses.

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**Keywords:** Cardiotocography Training Programme (CTP), Knowledge, Skill, Nurses. - Gayathri Priya
JOB STRESS AND COPING AMONG FISHERMEN

Janella Mariam Jacob1, Linu Sara George2 & Savitha3

1Lecturer, 2Professor & HOD, Department of Fundamentals of Nursing, 3Assistant Professor, Department of Psychiatric Nursing, Manipal College of Nursing, Manipal University, Manipal

Correspondence:
Janella Mariam Jacob
Lecturer, Manipal College of Nursing, Manipal University, Manipal
E-mail: janella_jacob@yahoo.co.in

Abstract:
Introduction: Fishing in Indian villages is considered one of the major occupations for the villagers. The work related health problems encountered by fishermen are vast. Long hours, extreme weather and working with heavy machinery contribute to a high mortality rate in fishermen. Despite a long standing acknowledgement of the dangers and mortality associated with fishing, there has been little research in this field.

Objectives: The objectives of the study were to: assess the job stress and coping among fishermen, find the relationship between job stress and coping, find the association between job stress, coping and demographic variables such as age, religion, marital status, type of family, education, monthly income and work experience.

Materials and Methods: A descriptive survey was undertaken among 140 fishermen using structured questionnaire. SPSS 16.0 software was used for data analysis. Frequency, percentage, Pearson’s product moment correlation and Chi-square were used.

Results: Majority of the subjects had moderate stress (62.1%) and moderate cope (91.4%). It is found in the study that there is a significant relationship between job stress and coping. There is a significant association between job stress and work experience ($\chi^2 = 6.90, p<0.05$).

Conclusion: Fishermen who work for long hours in the sea without any contact with their families are prone to problems with their work and their personal life as it is unsafe at sea.

Keywords: Fishermen, job stress, coping.

Introduction:
Fishermen are at higher risk of drowning and work related traumatic injuries, asphyxiation, skin allergies, gastric, skin and oesophageal cancers and lesions. Exposure (sun, weather extremes) conditions are also been observed to be health concerns for fishermen. Isolated working conditions, long shifts without sufficient rest, adverse weather, lack of formal safety training, inadequate personal protective equipment, and work related stress have been attributed to the increase risk associated with fishing. The workplace environment of fishermen is the least safe among all the other occupations and the more dangerous the physical environment is the more the fishermen is at risk for stress.1

A comparative study was conducted in Great Britain by the Department of Public Health of Oxford University to investigate the most hazardous occupation among all. Retrospective statistics of mortality were compared for the period between 1976-1995. The fishermen were 52.4 times more likely to have a fatal accident at work (95%) and seafarers were 26.2 times more likely, compared with other workers. Although the number of work related deaths has decreased in other occupation but fishing remains as hazardous as before. The study revealed that fishing is a dangerous occupation and many unfavourable working conditions were identified.2

A longitudinal survey study was conducted in Gdynia, Italy to evaluate the problem of work related accidents and injuries in fishermen. The study was conducted among deep sea fishing trawlers- factory ships of three large fishing companies for a period of 10 years. The population under study was 10,475 men and a control group of 4,073 workers employed on shore. 1688 work related accidents were recorded, including 33 fatal accidents. Incidence of
work related accidents was 16.54 per 1000. In the control group the incidence was 27.98 per 1000 men (0.03 fatal accidents per 1000). There were more accidents recorded in the control group, than in fishermen. The incidence of fatal cases was about 10 times higher among fishermen than among worker employed on shore.\(^3\)

A study done by Aneshensel, Rutter, and Lachenbruch in 1991, suggested that participants in shrimp fishing are at elevated risk for stress related health problems. The social stress model predicted elevated rates of mental health disorders as likely consequences of such stressful work. Their findings confirm the hypothesis that shrimp fishermen suffer mental disorders at more than twice the rate of the general male population, and at a rate significantly higher than that for male primary care patients. Shrimpers are especially vulnerable to mood and anxiety disorders, but are at no increased risk for alcohol abuse. This profile of disorders is rather unusual among North American men, who are generally more likely to be diagnosed with alcohol or other drug problems than with other mental disorders.\(^4\)

A descriptive study was done on work related health problems and job satisfaction among fishermen of Udupi district by Ansuya. Data was collected from 100 fishermen from Malpe and Kodi Bengre of Udupi district, Karnataka. It was found that most of the subjects (48%) experienced moderate health problems. The health problems experienced by the fishermen are back pain, burning in the eyes, scratching and stings injury, skin allergy, shoulder pain and muscle cramps and knee joint pain. Majority of the subjects i.e.(86%) were having moderate job satisfaction in their profession.\(^5\)

The objectives of the study were to assess the job stress among fishermen; assess the level of coping among fishermen and to find the relationship between job stress and coping. The findings of the study will help the professionals to plan an effective intervention to overcome the job stress and to enhance their coping.

Materials and Methods:
In order to find the correlation between the job stress and coping among the fishermen, the research design adopted for the study was a correlational survey design.

Convenient sampling was used to select 140 fishermen residing in Malpe and Kaup. The areas selected for the study were Malpe and Kaup from Udupi district. Malpe is located nine kilometres from Manipal. Majority of the population is engaged in fishing occupation. Kaup is located nineteen kilometres from Manipal. Majority of the population is engaged in fishing.

Demographic data were collected using a structured Demographic Proforma. The job stress scale was prepared by the researcher after reviewing research studies and discussion with experts in Mental Health Nursing. The coping was assessed by using a modified brief COPE by Carver.

Administrative permission and participant’s informed consent was obtained from each subject and confidentiality was assured by the researcher.

Statistical package for social sciences software (SPSS 16.0) was used for statistical analysis of raw data. Frequency, percentage, mean standard deviation and Pearson’s correlation test \(p>0.05\) were applied.

Results:
Table 1 describes the sample characteristics. Most of the subjects 32.1% were in the age group of 36-45 years. In religion, majority of the subjects 87.9% belonged to the Hindu religion, most of them 39.3% had high school education and 37.1% earned between 1500-3000 Rs per month. Out of the 140 subjects 67.9% were from nuclear family and 50% had more than 16 years of experience in offshore fishing.

Figure 1 and 2 describes the percentage of job stress and coping among fishermen. Majority of the subjects (62.1%) had moderate stress and (91.4%) had moderate cope. Table 3 describes the mean percentage score and standard deviation obtained by fishermen in subareas of coping.

Keywords: Fishermen, job stress, coping. - Janella Mariam Jacob
Further it was found in the study that there was significant relationship between job stress and coping (r = 0.189) at 0.05 level. There was significant association between job stress and work experience ($\chi^2 = 6.90, p<0.0$).

Keywords: Fishermen, job stress, coping.

Figure 1. Bar diagram showing percentage of job stress in fishermen.

Table 1. Baseline characteristics of fishermen n=140

<table>
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<tr>
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<td>&gt;6000</td>
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<td>6.3</td>
<td>11-16</td>
<td>28</td>
<td>20</td>
</tr>
<tr>
<td>6.4</td>
<td>&gt;16</td>
<td>70</td>
<td>50</td>
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Table 2. Mean percentage score and standard deviation obtained by fishermen in sub areas of coping. n=140

<table>
<thead>
<tr>
<th>Dimensions of coping</th>
<th>No. of item</th>
<th>Maximum score</th>
<th>Mean percentage</th>
<th>Standard Deviation</th>
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<tr>
<td>Self distraction</td>
<td>1</td>
<td>4</td>
<td>58</td>
<td>0.91</td>
</tr>
<tr>
<td>Active coping</td>
<td>2</td>
<td>4</td>
<td>63</td>
<td>0.85</td>
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<tr>
<td>Denial</td>
<td>2</td>
<td>8</td>
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<td>1.94</td>
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<tr>
<td>Substance abuse</td>
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<td>4</td>
<td>65</td>
<td>0.82</td>
</tr>
<tr>
<td>Emotional support</td>
<td>1</td>
<td>4</td>
<td>65</td>
<td>0.82</td>
</tr>
<tr>
<td>Instrumental support</td>
<td>1</td>
<td>4</td>
<td>59</td>
<td>0.80</td>
</tr>
<tr>
<td>Behavioural disengagement</td>
<td>1</td>
<td>4</td>
<td>67.3</td>
<td>0.85</td>
</tr>
<tr>
<td>Venting</td>
<td>1</td>
<td>4</td>
<td>55.87</td>
<td>0.72</td>
</tr>
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<td>Positive reframing</td>
<td>1</td>
<td>4</td>
<td>63.5</td>
<td>0.86</td>
</tr>
<tr>
<td>Planning</td>
<td>1</td>
<td>4</td>
<td>60.35</td>
<td>0.91</td>
</tr>
<tr>
<td>Humour</td>
<td>1</td>
<td>4</td>
<td>54.62</td>
<td>0.81</td>
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<tr>
<td>Acceptance</td>
<td>1</td>
<td>4</td>
<td>53.5</td>
<td>0.78</td>
</tr>
<tr>
<td>Religion</td>
<td>2</td>
<td>8</td>
<td>68</td>
<td>1.53</td>
</tr>
<tr>
<td>Self blame</td>
<td>1</td>
<td>4</td>
<td>67.75</td>
<td>0.80</td>
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</table>

Discussion:
In this study the investigator found that out of 140 fishermen 62.1% has moderate stress, 34.3% has severe stress and 3.6% has mild stress. Visser and Smets in their study on stress and stress related illness among medical specialist found that 55% had high levels of job stress.

The present study revealed that there is a positive significant relationship between job stress and coping. This finding is contradicted by a study to explore the relationship between job stress and coping strategies of Hong Kong nurses working in an acute surgical unit. Data were collected from 98 Hong Kong surgical nurses using the Nursing Stress Scale and the Jalowiec Coping Scale.
Results showed that workload ($M = 15.36$), lack of support ($M = 13.32$), and inadequate preparation ($M = 12.33$) are the most common stressors for Hong Kong surgical nurses. The most frequent strategies used by nurses to cope with stress can be characterized as evasive ($M = 19.23$), confrontive ($M = 17.46$), and optimistic ($M = 15.81$), all of which are also rated as the most effective strategies in reducing stress levels. Only the confrontive, optimistic, supporting, and emotive coping strategies reveal significant correlations ($p < .05$) with the stress levels of nurses, whereas the evasive, fatalistic, palliative, and self-reliant strategies showed no significant correlation with stress levels ($p > .05$).

The present study findings are also contradicted by another study conducted on correlation between stress, stress-coping and current sleep bruxism. Sixty-nine subjects, of which 48 were SB-patients, completed three German questionnaires assessing different stress-parameters and stress-coping-strategies. Results showed that different subscales of both the stress questionnaires and the coping questionnaire correlate significantly with SB. Regarding the coping strategies of subjects, the significant correlation found between the pixel score and the subscale ‘escape’ of the SVF-78 ($r=0.295$, $p<.05$) indicated that the more the subjects fled their problems and did not deal with stress in a positive way, the higher was their SB-activity.

The present study revealed that there is significant association between job stress and work experience. It shows that 40 fishermen who has work experience of more than 11 years has severe stress as compared to the 8 fishermen below 11 years of work experience. This finding is supported by a study conducted in Poland to determine suicides among polish seamen and fishermen during work at sea. Retrospective data on 51 suicides of Polish seamen and fishermen in the years 1960-1999 during work at sea are presented. The impact of age, rank, and the period of service upon the incidence of theses suicides are analysed. The calculated percentage share of suicides among all deaths registered at sea was compared with data referring to the general population. As regarded to the period of service only, the highest percentage of suicides was noted among merchant seamen with a period of service from 10 to 24 years, and among deep sea fishermen with the period of service of 10-14 years. The study has concluded that the suicidal tendencies and the planning of methods how to commit suicide are the effects of the extreme stress, exceeding the adaptation capabilities. Such a situation presents a serious hazard to the personal integrity and leads to the disappearance of the self-preservation instinct. Highly neurotic persons display low resistance to the isolation stress.

Conclusion:
As stress increases, each individual adapt to the changes in their own way. If the individual adapts to the stressor in a positive way there will be a decrease in stress and there will be increased coping but on the other hand if the individual adapts to the stressor in a negative way then there will be an increase in the stress and an ineffective coping.

Reference:
STUDY OF ACCESSORY FORAMEN TRANSVERSARIA IN CERVICAL VERTEBRAE

Pretty Rathnakar, Remya K. & Swathi

Assistant Professors, *Lecture, Department of Anatomy, K.S. Hegde Medical Academy, Nitte University, Deralakatte, Mangalore.

Correspondence: Pretty Rathnakar
Assistant Professor, Department of Anatomy, K.S Hegde Medical Academy, Deralakatte, Mangalore.
E-mail: prettyshrinath@gmail.com

Abstract:
The cervical vertebrae presents foramen transversaria in each transverse process. In all but the seventh cervical vertebra, the foramen normally transmits vertebral artery and vein and a branch from the cervicothoracic ganglion.

140 cervical vertebrae were studied. Variations were noticed in the number of foramen transversarium unilaterally and bilaterally. Variations in foramen transversarium may indicate the variation in course of vertebral arteries.

Keywords: Foramen transversaria, cervical vertebra, vertebral artery

Introduction:
The cervical vertebrae presents foramen transversaria in each transverse process. In all but the seventh cervical vertebra, the foramen normally transmits vertebral artery, vein and a branch from the cervicothoracic ganglion.

The foramen transversarium is a result of the special formation of the cervical transverse processes. It is formed by the vestigial costal element fused to the body and the true transverse process of the vertebra. The vertebral vessels and nervous plexus are caught between these two bony parts. The foramen transversarium is closed laterally by the costotransverse bar, a thin plate of bone connecting the rib element to the original transverse process.

The present study has important clinical implications for head and neck and vascular surgeons and radiologists.

Materials and Methods:

140 cervical vertebrae obtained from the Department of Anatomy and collected from the students were studied. Presence of unilateral or bilateral accessory foramen transversarium was noted.

Results:
8 out of 140 (5.7%) vertebrae presented accessory foramen transversaria.

Unilateral Accessory Foramen Transversaria
5 vertebrae (3.6%) had unilateral accessory foramen (table).
Bilateral Accessory Foramen Transversaria
2 vertebrae (1.42%) had bilateral double foramen transversaria.

One of the vertebra showed multiple foramen transversaria on right side and incomplete accessory foramen transversarium on the left.

Table: Unilateral Accessory Foramen Transversaria.

<table>
<thead>
<tr>
<th>ACCESSORY FORAMEN</th>
<th>RIGHT</th>
<th>LEFT</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOUBLE</td>
<td>3 (2.14%)</td>
<td>1 (0.7%)</td>
</tr>
<tr>
<td>INCOMPLETE</td>
<td>1 (0.7%)</td>
<td>NIL</td>
</tr>
</tbody>
</table>

Discussion:
Foramen transversarium transmits vertebral artery and vein in all cervical vertebrae except seventh.

Since the vertebral vessels are responsible for the formation of the foramen transversarium, it can be assumed that variations in the course of the vertebral vessels will cause variation in foramen transversarium.
vice versa variations of the foramen transversarium can be useful in estimating the variations of the vessels. An absence of foramen transversarium could mean absence of the vertebral artery or the artery running along the transverse process and not through the foramen transversarium. A narrowing of the foramina may indicate narrowness of the vessels.

Double foramen transversaria could mean duplicate vertebral arteries.²

The accessory foramina may be present to compartmentalise the contents of foramen transversarium.

The present study showed 5.7% vertebrae having accessory foramen transversaria, unilateral (3.6%) being more common than bilateral (1.42%).

A study reported 16 vertebrae having accessory foramen transversarium out of 200 cervical vertebrae studied.³

A study of 132 vertebrae reported double foramen transversaria unilaterally and bilaterally in two different cervical vertebrae.⁴

Jarostaw et al reported accessory foramina most common at the level of C6.⁵

A study observed accessory foramen transversarium in 1.6% of the cases, unilateral being more common than bilateral.⁶

El Shaarawy et al. observed that the accessory foramina transversaria were most common at the lower cervical vertebrae (C5, C6 and C7), mostly in C6.⁷

**Conclusion:**

In the present study we observed 8 out of 140 cervical vertebrae having accessory foramen transversaria. This is of clinical significance as the vertebral artery passes through it and presence of accessory foramen transversaria could mean variations in the number and course of vertebral artery. These variations are noteworthy to head and neck and vascular surgeons and radiologists in studying computed tomography and MRI scans.

**Keywords:** Foramen transversaria, cervical vertebra, vertebral artery

- Pretty Rathnakar
Keywords: Foramen transversaria, cervical vertebra, vertebral artery

- Pretty Rathnakar

References:

A DESCRIPTIVE STUDY TO ASSESS THE PERCEPTION ON DEATH AND DYING AMONG NURSING STUDENTS IN SELECTED COLLEGES OF NURSING IN UDUPI DISTRICT, KARNATAKA STATE

Preethy Jawahar¹, Soumya Alex² & Anice George³
¹Assistant Professor, ²Assistant Lecturer, ³Dean & Director of Nursing Education, Manipal College of Nursing Manipal, Manipal University, Manipal

Correspondence : Preethy Jawahar
Assistant Professor, Manipal College of Nursing Manipal, Manipal University, Manipal.
E-mail : preethyj001@gmail.com, preethy.jawahar@manipal.edu

Objective: The objectives of the study were assess nursing students perception on death and dying and to identify the perception on death and dying among nursing students of different levels.

Materials and Methods: A descriptive survey design was used. Data were collected from 210 nursing students in selected Colleges of Nursing in Udupi district, Karnataka state by using semi structured questionnaire.

Result: Thoughts: while caring dying patients and their families, 66.6% perceived thoughts regarding the physical, emotional, spiritual care given to patients who were dying and 77.6% regarding their family or friends. 57.1% perceived thoughts regarding their sufferings, 88% perceived thoughts about a realization that death is a part of life, 29.5% perceived thoughts about the survival and 42.8% perceived that being able to care for dying patients as a privilege and it is an opportunity to work with those who are going through the dying process.

Feelings: 40.5% nursing students had physiological symptoms like nausea, muscle tension, headache, 53.8% had fear, 68.5% developed compassion, 86.6% had sadness and 46.2% developed anxiety while caring for dying patients and their families.

Challenges: 67.1% of nursing students unaware about how to communicate with unresponsive patient, 61.9% expressed they had language barrier and 71.4% developed problems related to severe emotions while caring dying patients and their families.

Conclusion: There is a great need to educate students about death and dying, cultural competence, communication skills and coping with emotional stress.

Keywords: perception, death and dying, feelings, thoughts, challenges.
Materials and Methods:
A survey approach was adopted with a descriptive design and was conducted in selected Colleges of Nursing in Udupi district, Karnataka. Tool 1: Demographic Proforma and Tool 2: Semi-structured questionnaire on perception on death and dying (section A: Regarding thoughts, section B: Regarding feelings and section C: Regarding challenges) were developed by the researcher and were validated by three experts in the field of nursing. Pretesting was done among 5 samples to determine the clarity of items. Pilot study was conducted among 20 samples. Non-probability convenient sampling technique was used to select the samples. Sampling criteria were those who are willing to participate in the study and who are undergoing B.Sc or PBB.Sc or M.Sc nursing programme. Main study was conducted in selected Colleges of Nursing in Udupi district, Karnataka state among 210 nursing students. The obtained data were analyzed based on the objectives and the hypothesis by using descriptive statistics with the help of SPSS version 16.

Results:
Analysis is done by using descriptive statistics. Data is organized under the following headings.
Section 1: Description of sample characteristics.
Section 2: Description of nursing students' perception on death and dying.
Section 3: Description of perception on death and dying among nursing students of different levels.

Section 1: Sample characteristics
Table 1: Frequency and Percentage distribution of sample characteristics (n=210)

Fig 1: Thoughts perceived by nursing students on death and dying (n=210)
The data presented in fig 1 shows that while caring dying patients and their families, 66.6% perceived thoughts regarding the physical, emotional, spiritual care given to patients who were dying and 77.6% regarding their family or friends. 57.1% perceived thoughts regarding their sufferings, death as a relief from suffering and there was a relief felt for the patient when they are no longer dealing with the illness or pain. 88% perceived thoughts about a realization that, death is a part of life, 29.5% perceived thoughts about the survival and 42.8% perceived that being able to care for dying patients as a privilege and it is an opportunity to work with those who are going through the dying process.

Fig 2: Feelings perceived by nursing students on death and dying (n=210)
The data presented in fig 2 shows that, 40.5% nursing students had physiological symptoms like nausea, muscle tension, headache, 53.8% had fear, 68.5% developed compassion, 86.6% had sadness and 46.2% developed anxiety while caring for dying patients and their families.

Fig 3: Challenges perceived by nursing students on death and dying (n=210)
The data presented in fig 3 shows that, 67.1% of nursing students unaware about how to communicate with unresponsive patient, 61.9% expressed they had language barrier and 71.4% developed problems related to severe emotions while caring dying patients and their families.

Section 3: Description of perception on death and dying among nursing students of different levels.
The data presented in table 2 shows that while caring dying patients and their families, majority of fourth year B.Sc nursing students had perceived thoughts regarding the physical, emotional, spiritual care given to patients who were dying. Majority of M.Sc nursing students had perceived thoughts regarding their family or friends. Majority of fourth year B.Sc nursing students had perceived thoughts regarding their sufferings, death as a relief from suffering and there was a relief felt for the patient when they are no longer dealing with the illness or pain. Majority of M.Sc nursing students had perceived thoughts about a realization that, death is a part of life. Majority of first year
B.Sc nursing students had perceived thoughts about the survival and Majority of PBB.Sc nursing students perceived that being able to care for dying patients as a privilege and it is an opportunity to work with those who are going through the dying process. Majority of first year B.Sc nursing students had physiological symptoms like nausea, muscle tension, headache; fear, sadness and anxiety while caring for dying patients and their families. Majority of first year B.Sc nursing students were unaware about how to communicate with unresponsive patient, expressed they had language barrier and developed problems related to severe emotions while caring dying patients and their families.

**Fig 1:** Thoughts perceived by nursing students on death and dying (n=210)

**Table 1:** Frequency and Percentage distribution of sample characteristics (n=210)

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Sample characteristics</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
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</thead>
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<tr>
<td>1</td>
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<tr>
<td></td>
<td>16 - 18</td>
<td>30</td>
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</tr>
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<td>Nursing students who had experiences with dying patient and their families during clinical posting</td>
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</table>

**Discussion:**

**Recommendations**

- Replication of the same study on a large sample may help to draw conclusions that are more definite and generalizable to a larger population.
- A similar study can be conducted using different data collection methods.
- Qualitative study can be done among nursing students assess the perception on death and dying.
- Replication of the similar study can be conducted by selecting samples by random sampling method.
**Table 2:** The frequency distribution of perception on death and dying among nursing students in different levels

\[
(n = 35 + 35 + 35 + 35 + 35 + 35 = 210)
\]

<table>
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<th>Sl. No</th>
<th>Sample characteristics</th>
<th>1(^{st}) year</th>
<th>2(^{nd}) year</th>
<th>3(^{rd}) year</th>
<th>4(^{th}) year</th>
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<th>M.Sc (n=35)</th>
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<td>21</td>
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<td>Family</td>
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<td>29</td>
<td>22</td>
<td>19</td>
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<td>They won’t suffer more</td>
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<td>25</td>
<td>24</td>
<td>25</td>
<td>18</td>
<td>23</td>
</tr>
<tr>
<td>1.4</td>
<td>It is a part of life</td>
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<td>31</td>
<td>31</td>
<td>32</td>
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<td>34</td>
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<td>14</td>
</tr>
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<td>14</td>
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<td>Compassion</td>
<td>27</td>
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<td>28</td>
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<td>15</td>
<td>27</td>
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<td>Sadness</td>
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<td>30</td>
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<td>Anxiety</td>
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<td>23</td>
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<td>3</td>
</tr>
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<td>Challenges</td>
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</tr>
<tr>
<td>3.1</td>
<td>Don’t know how to communicate</td>
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<td>24</td>
<td>22</td>
<td>17</td>
<td>27</td>
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<td>Language barrier</td>
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</tr>
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<td>Severe emotions</td>
<td>33</td>
<td>26</td>
<td>29</td>
<td>20</td>
<td>14</td>
<td>27</td>
</tr>
</tbody>
</table>

**Conclusion:**

Understanding students’ perceptions of death and dying can help educators prepare students for these situations by using the research available to plan better ways to teach students about the needs (physical, spiritual, emotional and social) of the dying/terminal patient and their family. There is a great need to educate students about death and dying, cultural competence, communication skills and coping with emotional stress.

**Reference:**


**Keywords:** perception, death and dying, feelings, thoughts, challenges.

- Preethy Jawahar
EFFECTIVENESS OF JASMINE OIL MASSAGE ON REDUCTION OF LABOR PAIN AMONG PRIMIGRAVIDA MOTHERS

Reeja Mariam Joseph 1 & Philomena Fernandes 2
1 II year M.Sc. (N) Student, 2 Associate Professor & HOD, Department of OBG Nursing
Nitte Usha Institute of Nursing Sciences, Nitte University, Deralakatte, Mangalore - 575 018, India.

Correspondence
Philomena Fernandes
Associate Professor & HOD, Department of OBG Nursing, Nitte Usha Institute of Nursing Sciences,
Nitte University, Deralakatte, Mangalore - 575 018, India.
Mobile : +91 94492 07845    E-mail : philfers7@gmail.com

The study was conducted to assess the effectiveness of jasmine oil massage on labour pain during first stage of labour among 40 primigravida women. The study design adopted was true experimental approach with pre-test - post-test control group design. The demographic Proforma were collected from the women by interview and Visual analogue scale was used to measure the level of labour pain in both the groups. Data obtained in these areas were analysed by descriptive and inferential statistics. A significant difference was found in the experimental group (t 9.869 , p<0.05). A significant difference was found between experimental group and control group. The pre-test (t 0.36, p>0.05) and the post-test (t 11.75, p<0.05). No significant association was found between the level of labour pain and demographic variables in the experimental group. In this study Jasmine oil massage proved to reduce first stage labour pain.

Keywords : Jasmine oil massage, labor pain, primigravida mothers, visual analogue scale

Abstract :
The study was conducted to assess the effectiveness of jasmine oil massage on labour pain during first stage of labour among 40 primigravida women. The study design adopted was true experimental approach with pre-test - post-test control group design. The demographic Proforma were collected from the women by interview and Visual analogue scale was used to measure the level of labour pain in both the groups. Data obtained in these areas were analysed by descriptive and inferential statistics. A significant difference was found in the experimental group (t 9.869 , p<0.05). A significant difference was found between experimental group and control group. The pre-test (t 0.36, p>0.05) and the post-test (t 11.75, p<0.05). No significant association was found between the level of labour pain and demographic variables in the experimental group. In this study Jasmine oil massage proved to reduce first stage labour pain.

Keywords : Jasmine oil massage, labor pain, primigravida mothers, visual analogue scale

Introduction : Child birth is linked to the experience of pain. Labour pain is often described as the most intense pain ever experienced, and in many cases, it is the aspect of childbirth most feared by the expectant mother. The goal of eliminating labour pain is based on the assumption that pain inevitably equals suffering. Many pharmacological approaches are carried out to relieve pain which causes deleterious effect on mother’s and fetus health. Massage therapy is one of the most wonderful methods that can be used during labour with numerous physical and emotional benefits. An aromatherapy massage given by partner or a member of birth team is a wonderful way to help the women to relax and soothe the pain of contractions. The oils help reduce friction on the skin at the same time as having therapeutic benefits. Women who have experienced skilful massage during labour say that the massage was helpful and pain relieving. Pain in labour is nearly universal experience for child bearing women. Pain and its relief for women in labour has been a subject of interest since the dawn of mankind. Pain during childbirth is generally handled with pharmacological techniques. Complementary, non-pharmacologic methods of pain relief are a part of nursing practice that can be safely introduced in early labour. Massage is one of the best non pharmacological therapy useful in labour. It has the potential benefits such as decreasing the intensity of pain, relieving the muscle spasm, promoting general relaxation and reducing anxiety. A back massage is always comforting, particularly if the woman is experiencing back pain. Jasmine oil is one of the essential oil used in labour. Jasmine’s ability to reduce pain and spasms and increase contraction strength makes it one of the best essential oils for labour. Massage around the lower back with jasmine, clary sage, rose and lavender has been reported to provide subjective benefit in labour. It stimulates the body to release endorphins, which are natural pain killing and mood lifting substances. Massage is hence recommended by child birth experts as it has been shown to ease pain and reduce anxiety in the first stage of labour and also linked
with the shorter labours and a low risk for postpartum depression. The study findings are consistent with the findings of Karami N K, Safarzadeh A, Fathizadeh N (2009) who had conducted a study to evaluate the effect of massage therapy on severity of labour pain. The finding of the study shows that the pain severity at the first stage of labour was significantly different between the experiment group and the control group. At the start of active phase (p=0.009), end of transitional phase (p=0.014) and end of first stage (p=0.01) in the experimental group.

Most of the hospitals in the state of Mangalore do not implement any non-pharmacological therapy to reduce the pain or discomfort. Research studies revealed that non-pharmacological measures like back massage is very effective in reducing the labour pain during first stage of labour and as use of oil makes massage easier to carry and more pleasant to receive. Thus the investigator felt the need and planned to give back massage with jasmine oil and assess its effectiveness on first stage labour pain among primigravida women.

Materials and Methods

The study design adopted was true experimental approach (pre test - post test control group design). Population comprised of primigravida mothers in the first stage of labour in selected hospitals at Mangalore. Purposive sampling technique was used for selection of 40 sample, and random allocation was adopted to assign 20 sample to experimental and, 20 sample to control group. The information regarding the demographic Proforma were collected from the women by interview and Visual analogue scale (VAS) was used to measure the level of labour pain. Pre-test was done to assess the level of labour pain in both the groups using VAS. Thereafter primigravida women in the experimental group were given jasmine oil back massage for 10 minutes for 3 times at an interval of 30 minutes and primigravida women in the control group were given only normal labour care. Post-test was done in the experimental group after half an hour of the 3rd massage and post-test was done in the control group after 2 hours of the pre-test. Data obtained in these areas were analysed by frequency percentage, paired t-test, independent t-test and fishers exact test.

Results:
The findings are discussed under the following headings.

SECTION 1: Demographic Characteristics of the Primigravida Women

<table>
<thead>
<tr>
<th>Demographic variables</th>
<th>experimental group n=20</th>
<th>control group n=20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-22 years</td>
<td>11 55</td>
<td>9 45</td>
</tr>
<tr>
<td>22-26 years</td>
<td>8 40</td>
<td>9 45</td>
</tr>
<tr>
<td>26-30 years</td>
<td>1 5</td>
<td>2 10</td>
</tr>
<tr>
<td>Education</td>
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<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Primary school</td>
<td>3 15</td>
<td>1 5</td>
</tr>
<tr>
<td>High school</td>
<td>6 30</td>
<td>3 15</td>
</tr>
<tr>
<td>PUC/Diploma</td>
<td>6 30</td>
<td>13 65</td>
</tr>
<tr>
<td>Graduate/PG</td>
<td>5 25</td>
<td>3 15</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heavy worker</td>
<td>1 5</td>
<td>1 5</td>
</tr>
<tr>
<td>Moderate worker</td>
<td>4 20</td>
<td>2 10</td>
</tr>
<tr>
<td>Sedentary worker</td>
<td>6 30</td>
<td>9 45</td>
</tr>
<tr>
<td>Unemployed</td>
<td>9 45</td>
<td>8 40</td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hindu</td>
<td>9 45</td>
<td>12 60</td>
</tr>
<tr>
<td>Christian</td>
<td>3 15</td>
<td>1 5</td>
</tr>
<tr>
<td>Muslim</td>
<td>8 40</td>
<td>7 35</td>
</tr>
</tbody>
</table>

Attended Child Birth Education Classes

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>70</td>
</tr>
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</table>

SECTION 2: Clinical Data of the Primigravida Women

<table>
<thead>
<tr>
<th>Clinical data</th>
<th>Experimental group</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-test</td>
<td>Post -test</td>
</tr>
<tr>
<td>FHR</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td></td>
<td>138.4</td>
<td>8.88</td>
</tr>
<tr>
<td>SBP</td>
<td>122.0</td>
<td>4.47</td>
</tr>
<tr>
<td>DBP</td>
<td>80.0</td>
<td>7.07</td>
</tr>
<tr>
<td>Pulse</td>
<td>82.4</td>
<td>5.18</td>
</tr>
</tbody>
</table>
SECTION 3: Analysis of Subjective Pain Parameters of the Primigravida Women

The pre-test data shows that in experimental group, 5% (1) had mild level of pain, majority 80%(16) of primigravida women had moderate level of labour pain and 15%(3) had severe level of labour pain, and 0% had worst pain. Whereas in control group, 5 % (1) had mild pain and majority of primigravida women 75%(15) had moderate level of labour pain and 20%(4) had severe level of labour pain.

The post-test data shows that in experimental group, majority of primigravida women 70%(14) of primigravida women had mild level of labour pain, 30%(6) had moderate level of labour pain and 0% had worst pain. Whereas in control group, 15%( 3) had moderate pain and majority of primigravida women, 60 % (12) had severe level of labour pain and 25 % (5) had worst level of labour pain.

SECTION 4: Comparison of the Labour Pain Scores Within the Group and Between Experimental and Control Group

Table 3: Comparison of VAS in experimental group using paired 't' test

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>Mean Difference</th>
<th>'t' value</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>5.35</td>
<td>1.31</td>
<td>2.25</td>
<td>9.87*</td>
<td>19</td>
<td>19</td>
<td>0.001</td>
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<tr>
<td>Post-test</td>
<td>3.10</td>
<td>1.1</td>
<td>1.25</td>
<td>0.05</td>
<td>2.09</td>
<td>38</td>
<td>0.05</td>
</tr>
</tbody>
</table>

* Significant p<0.05 table value (2.09)

Table 4: Comparison of VAS between experimental group and control group using independent t test

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>Mean Difference</th>
<th>'t' value</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>5.35</td>
<td>1.31</td>
<td>0.15</td>
<td>0.36</td>
<td>38</td>
<td>0.72</td>
</tr>
<tr>
<td>Control</td>
<td>5.20</td>
<td>1.32</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>3.10</td>
<td>1.1</td>
<td>4.85</td>
<td>11.75*</td>
<td>38</td>
<td>0.001</td>
</tr>
<tr>
<td>Control</td>
<td>7.95</td>
<td>1.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Significant p<0.05 table value (2.024)

SECTION 5: Association Between Level of Labour Pain With Demographic Variables.

Table 5: Association between the level of labour pain using visual analogue pain score of experimental group with their demographic variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Moderate</th>
<th>Severe</th>
<th>p-value</th>
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</thead>
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<td></td>
<td></td>
</tr>
<tr>
<td>18-22 years</td>
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<td>1</td>
<td>0.11</td>
</tr>
<tr>
<td>22-26 years</td>
<td>7</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>26-30 years</td>
<td>3</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary school</td>
<td>2</td>
<td>1</td>
<td>0.29</td>
</tr>
<tr>
<td>High school</td>
<td>5</td>
<td>1</td>
<td>NS</td>
</tr>
<tr>
<td>PUC/diploma</td>
<td>5</td>
<td>1</td>
<td></td>
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<tr>
<td>Graduate/PG</td>
<td>4</td>
<td>0</td>
<td></td>
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<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heavy</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
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<td>0.79</td>
</tr>
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<td>Sedentary</td>
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<td>1</td>
<td>NS</td>
</tr>
<tr>
<td>unemployed</td>
<td>7</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Religion</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Hindu</td>
<td>8</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Christian</td>
<td>2</td>
<td>1</td>
<td>0.49</td>
</tr>
<tr>
<td>Muslim</td>
<td>6</td>
<td>2</td>
<td>NS</td>
</tr>
<tr>
<td>Attended child birth education classes</td>
<td>Yes</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>12</td>
<td>2</td>
</tr>
</tbody>
</table>

NS- not significant

Discussion:

In this study Jasmine oil massage proved to reduce first stage labour pain.

The study findings are consistent with the findings of Chandra T (2011) who had conducted a study to evaluate the effect of olive oil back massage therapy on labor pain during first stage of labor among primigravida women in selected hospital at Selam. Oil massage was given to all the mothers and the pain, was measured after massage and compared with pre-test value. The findings of the study shows that the mean of pain severity at the first stage of labour was significantly different between the experiment group and the control group. The result concluded that there was significant reduction of labour pain 't'= 8.88 which was significant at 0.01 level of significance.
Conclusion:

Pain in labour is a nearly universal experience for childbearing women. Labor pain is a challenging issue for nurses designing observation protocols. The present study assessed the effectiveness of jasmine oil massage on reduction of labour pain during first stage of labor among primigravida mothers. Based on statistical findings, it is evident that the jasmine oil massage was effective in reducing level of first stage labour pain among primigravida women.

Recommendations:

- A similar study can be conducted in larger sample.
- A similar study can be conducted among primigravida mothers in latent phase of labor.
- A comparative study can also be done between the effectiveness of various non pharmacological measures for labour pain.
- A comparative study can also be conducted between primi and multi women in labour.
- A study can be done to find the effectiveness of jasmine oil massage on cervical dilatation.

References:

CHANGING HEALTH CULTURE AND MEDICAL PLURALISM IN THE RURAL CONTEXT : A CONFRONTATION OR A PUZZLE?

Nanjunda
Faculty Member, Social Exclusion Research Centre, Mysore University, Mysore.

Correspondence:
Nanjunda
Faculty Member, Social Exclusion Research Centre, UGC-CSSEIP, Mysore University
Mobile : +91 98809 64840     E-mail : anthroedit@ymail.com

The health culture, and medical pluralism have a long history. Over the last 100 years many concepts, theories, findings have been given for the better understanding of health culture of human beings and the role of the society being. The majority of the theoretical approaches relating to the health and illness originally propounded by the western sociologists. Even today researchers in developing countries are heavily depending on western theories to explain sociology of health culture and medical pluralism. In developing countries, social class, caste, gender plays a vital role in accessing to suitable healthcare facilities. More than these the underlying political and economic forces also counts a lot. It is found that health culture, and medical pluralism are significantly helps us in better understanding people’s concepts about onset of various diseases and its cure in a cross cultural framework. Right from the history, sociologists are attempting to find out how social and cultural factors influences in understanding of illness and diseases. The sociologists are also probing how social, economic, and cultural factors the acting and the choosing different health care system (pluralism). With this background this paper is to reveal authors personal experiences working on different health projects in several villages of Karnataka state south India. This paper concludes that health culture and medical pluralism in the rural part have largley been influenced by the emerging social and cultural factors under aegis of globalization in a new direction which requires new discourse.

Keywords : Health, Culture, Disease, Rural, Pluralism.

Abstract :
The health culture, and medical pluralism have a long history. Over the last 100 years many concepts, theories, findings have been given for the better understanding of health culture of human beings and the role of the society being. The majority of the theoretical approaches relating to the health and illness originally propounded by the western sociologists. Even today researchers in developing countries are heavily depending on western theories to explain sociology of health culture and medical pluralism. In developing countries, social class, caste, gender plays a vital role in accessing to suitable healthcare facilities. More than these the underlying political and economic forces also counts a lot. It is found that health culture, and medical pluralism are significantly helps us in better understanding people’s concepts about onset of various diseases and its cure in a cross cultural framework. Right from the history, sociologists are attempting to find out how social and cultural factors influences in understanding of illness and diseases. The sociologists are also probing how social, economic, and cultural factors the acting and the choosing different health care system (pluralism). With this background this paper is to reveal authors personal experiences working on different health projects in several villages of Karnataka state south India. This paper concludes that health culture and medical pluralism in the rural part have largley been influenced by the emerging social and cultural factors under aegis of globalization in a new direction which requires new discourse.

Keywords : Health, Culture, Disease, Rural, Pluralism.

Background :
Health culture: In a broader definition given by the WHO 'health culture means a set of cultural beliefs about health and illness that forms. The health seeking and health promoting behavior depends on an institutional arrangements within which that behavior evolves and the socio-economic, political and physical context of that beliefs and reason thereof. Some of the western anthropologists in their writings have opined that even though western medicines are having a high rate of success it has not been accepted by the Indian rural people because of their unique health culture. However some of the western epidemiologists have proved that rural people can be convinced to adopt the western medical system without affecting their inherited, health culture and belief by adopting cultural sensitive healing approaches.

According to some of the Social anthropologist health culture may be explained as an acquired health behavior to separate it from that domain of health seeking behavior due to physiological stimulations. Sometime acquired health behavior may pass from generation to generations. It is learned that the health culture of one society may get transmitted to the other society. Banerji (1982) has opined “health culture and health behavior is a sub cultural complex of the whole way of life style of the community”. ‘further he redefined that sub cultural complex includes both personal and objective environments; an external interventions in the action of internal environment of human beings in a given context’. It may include both material and non-material culture of the community at any given point of time.

Medical Pluralism :
“Medical Pluralism is adaptation of more than one medical system or simultaneous integration of orthodox medicine
with complementary and alternative medicine (CAM)” (Prakash, 2000)

Medical pluralism is a part and parcel of socially stratified and culturally diverged nature of any society. Since numerous medical systems are available in the society sometime these medical systems (pluralistic therapy) may have to compete each other over the success rate. Sometime due to influence of changing health culture the underlying notion in each medical system will also get changed. Individual practitioners will adopt appropriate techniques in administering each therapy. While administering more than one therapy to a single patient co-operation and co-existence can be expected within the various medicinal system. Sometime biomedical system dominates over indigenous medical system. Hence medical pluralism sometime should be referred as ‘mix of tradition and modern medicines within an existing complex factor of political, eco-nominal, social and cultural hegemony in a given society’ (Elling-1981). Medical pluralism is a cultural dependent rather than cultural independent. Medical pluralism is a kind of social system because medical pluralism will rise and contrast within a broader frame work of social, cultural and political context. Every medical system will have its own anthology, theory, and epistlemelody. Every medical system plays a vital role in providing needed health care for the people.

Health culture and Medical Pluralism in the Rural Context
Disease and sickness exist along with the evolution of human beings. Hence every society has developed certain methods to cure such type of diseases by using different kinds of medicines. Truly speaking it may be of any type of medicine but it has no an independent existence without the parallel help from the society. It’s nature, application and context etc will depend on contemporary cultural pattern. Largely we can say it depends on the pattern itself within a given community. Various conventional approaches for the health development implemented in the community have been failed. Hence, sociologists felt sustainable, geographically and cultured specific health development and programmes model should be introduced. Medical anthropologists felt indigenous knowledge must be the basis for any new health development programme focusing rural people. Rural part of India is rich sources of indigenous knowledge to cure various health disorders. It is known that health seeking behavior of a community involves both beliefs and practices about health and sickness. Normally these beliefs and practices are based on inherited and deep-rooted traditions. Probably these traditional based health cultures are more prevalent in the rural area because of minimal influences of external agencies. Also illiteracy, lack of modern health facility, ignorance contributes a lot for prevailing of poor health status. Apart from these factors rural health culture will be heavily influenced by socio-economic status, spiritual wellness, family and neighboring support- system etc (White, 2002).

There are many instances to demonstrate the significance of indigenous knowledge in curing various health and sickness problems in the community. However rich ecological and cultural diversity cannot be completely heightened if we confined our knowledge and perception to conventional scientific concepts of health and sickness. India is a home to many medical pluralism like Ayurveda, Unani, Sidda, methods date back to 5,000 B.C. Even today they remain a vital source of every day health care in curing common diseases in both rural and urban part. These different kind of medicinal system are culturally familiar, technically simple, locally available and effective. Since indigenous health knowledge is culturally and spiritually very near to the people traditional medicine plays a vital role, as a part and parcel in case of rural health culture (Conrad, 2008).

It is widely known fact that the health status of the rural people will be poor because of isolation, habitat, difficult terrain, poor understanding of their health behavior etc. Hence medical anthropologists suggest to follow an integrated multidisciplinary approach to understand rural health concepts, focusing diagnostics, curative and preventive health care. Since sometime rurals may have to face some advance diseases like Malaria, T.B, Typhoid, STD,
Malnutrition, Anemia, sometime their traditional medical system may get failed in diagnosing and curing the problem within their pluralistic therapy.

Perception on illness and sickness may directly affect on health seeking behavior of the particular community. In rural area socio-cultural pattern will be very complex and also it plays a major role in adopting different kinds of treatment to cure any health problem. In rural setup health and disease are more related to practice numeral medicines. Since trained doctor’s available in certain rural parts folk medicine co-exists with the modern medicine. In this concept changing rural health culture and pluralism may be more perceived in the context of knowledge of health problems, health beliefs, new techniques of healing, norms and values related to health and disease and limitations of different types of pluralistic therapies (Choudhuri, 1986).

Ackerknectue (1942) has opined about medical pluralism that,

1. Rather than one type of traditional medicine there is an existence of various types of traditional medicines in a society.
2. The difference among various types of traditional medicines are very small valuations in their "elements" than varies in the existing medical system which is basically shared by their given general cultural types.
3. The degree of unification of various elements of medicine into a whole and of the whole medicine into existing health cultural pattern differs significantly.

During the process of socialization health culture will be an integrated part of an individual and it helps in shaping own health seeking behavior or action in due course of his/her lifetime. As Bir (2002) opined, "In fact, the organic needs that operate the internal environment or system of an individual such as needs for food, sex, protection etc... are sources of stimulus force or motivation for independent action of the system of health culture". Further Hassan (1967) felt “The level of satisfaction of these needs takes place in accordance with the values of health culture acquired by man as a member of community or society”.

Certain medical sociologist and medical anthropologist have opined that modern world should not ignore the entire traditional medical system including diagnosis and healing techniques available in various medical system. Each and every action has an equal reaction in every traditional medical system has its own meaning, mechanisms, effects and interference. Truly speaking health culture and pluralism have an autonomous and independent existence in any society.

Systemic investigation on rural health culture has gained vital consideration in medical sociology. Studies have been conducted to get the core concept of rural therapeutic behavior and nature of ethno-medical system. Currently, various studies are focusing cultural perception, cultural labellization, medicalisation culture experience and cultural communication, illness ideology in curing various diseases adopted by the rural folk. However certain studies found that socially constructed medical roles to enhance particular health behavior and cross societal similarities and changing patterns in such a behavior. Certain studies have also revealed medical pluralism and health seeking behavior of a one family may affect entire village. Also because of cultural diffusion a number of similarities and variables with respect to health seeking behavior of the rural individuals can also be seen. Sometime life style of the particular person, how seriously he considers his/her health problem and frequency of occurrence of the particular health problem plays a significant role in the other patients also a specially in rural parts (White, 2002; Zola, 1978).

In addition, age old strong beliefs of rural people in local traditional healer and in his treatment and practices in religious rites may be a kind of hurdle in accepting modern health care facilities. This is significantly vital in shaping common or similar pattern of health seeking and health promoting behavior. Studies have also found that influence of socio, cultural, ecological, political and physical dimensions within the given institution. It is found that health seeking behavior varies according to the type of illness, causation of illness, gender of the ill person and age of the person affected by a particular illness. Hence expert
felt study should focus how medical aspects influenced by the social cultural issues and how given socio-cultural issues influence by the medical aspects. Further certain studies have opined that both indigenous and modern medicines have a certain common platform and it is better to study the rural health culture from the context of both differences and similarities within their two systems of medicine and to find out cultural factor affecting in accepting indigenous medicine and cultural inhabiting factors in accepting modern medicine.

Various studies have proved that established health behavior should not be under estimated citing them as illiterate or superstitious. It is believed that people’s health behavior, depends on the particular culture, particular geographical area and particular eco-system. Even today major section of the rural people is not ready to accept the modern health system. Due to their cultural resistance many rural targeted programmes have not been succeeded yet. Medical Anthropologists felt modern health programmes, don’t have any space to respect people inherited health culture, behavior, emotions and spiritual meaning associated with health and disease. Here culture and eco-system plays a vital role on people in seeking particular type of medical assistance and healing options (Kroeger,1983; Gester ,1984).

Hypothetical Pathway Linking Socio economic time preference and prospective and health related behavior. (Jean Adams, 2009)

The strong beliefs or faith of the people relating to the different healing technique does matter a lot. Also the role of family members, villagers, and others plays a vital role in rural health culture, seeking a particular type of medical assistance within the given context of medical pluralism including hakims, local traditional healers, nomadic vaidy’s, ayurvedic and modern allopathic practitioners. It is found that medical practice among rural people is highly pluralistic because of various external agencies. In certain parts of the rural areas both traditional medicine and biomedicine co-exists and some time people seek assistance from the both!. Also in certain part of the rural area government has opened allopathic and ayurvedic medicines, so that rural people can select any type of medical system regarding prevention, curative and rehabilitative measures. Hence, we can opine that health seeking behavior of rural people is gradually becoming flexible because of new elements in their health culture. Experts opined that there is a dearth need of new sociological studies about the dynamics of changing rural health culture focusing philosophy of a system of pluralistic medicines and its success or failure (Payyappallimana, 2011).

The typology of traditional medical practice classified for describing the legal role of traditional medicine in different medical systems by showing that

1. They are all dominated by modern medicine or cosmopolitan medicine,
2. In practice the exclusive system are pluralistic and,
3. The integrated systems include many aspects traditional medicine.

In practice, the inclusive and integrated system forms a continuum; just at the exclusive tolerant system is continuous with each other. Studies have shown that medical pluralism of the rural community is now changing because of new socio-economic and political equations under an aegis of globalizations. Accessibility and availability of different medical practices mainly play a vital role in diffusing health culture and fulfilling health needs of the rural people at affordable cost.

Studies found the traditional medicine system may be dislocated from their past golden days due to the
popularity and success rate pluralistic therapy. Emphasizing health behavior issue from the prospective of rural cultural fabrics towards refusal or accept various medical system needs fresh date. As noted by the western sociologists that the future of the traditional medical system because of inclusion of consistent inter-generational contents is also a big question in developing societies.

There are extreme many diversities in the demographic behavior of rural including ethically, socially, economically in various ecological, environmental and developmental settings. It is found that health behavior and medical pluralism are much controlled by the social tradition and family based frame of mind rather than social growth and economic status. In certain rural part traditional and modern medical system continues to be antagonistic to each other (Singh, 2008). This is why rural people have ‘pharmacopeia of their own for their common diseases’.

Rather than different forms of medicine, it would be significant if we consider the place of medicine occupied in the life of rural people, respect and strong belief towards any medicinal system. It is found that cross-cultural analysis of the practice of different healing techniques, health behavior in different cultures would be very vital in generalizing the pattern of the health culture across the real society. It is opined that the psycho therapeutic elements and strong faith on the local healer plays highly significance in curing the diseases and sickness. It is found that divination also significant in the traditional medical system. As Joshi opined “diviners are the healers who plays an intermediate role between the culturally postulated super human and the society”, (Joshi,1990). The healing techniques used by the diviners would be a very vital in every medical system.

It is opined that before implementing any community health programmes there is a need of understanding different medical system (pluralism) found in the society. Yet we consider all practitioners of a different health care system taken into account providing proper health care personnel’s is not a problem. The layman concept of various medical system in vital in framing suitable health programme for the rural people. Practitioners belongs to various medical system will use knowledge of the different medical system with all proper under standing about theoretical background many of them leave the patient to danger. Normally rural people depend on any traditional medicine if they could not get modern medicine on time. Even though simple health infrastructure will not be available in rural area but government shows interest to improve health status of the urban people only. It found that both medical interventions and non medical intervention are the need of the hour focusing rural part of the country.

**Conclusion:**

Since rural society is a multicultural one in certain cases health culture always differ from caste to caste. People belongs to twice born caste will observe a dual type of health culture. In rural setting caste plays a vital role. Sometime low caste people will not visit quacks who belongs to the higher caste. In the same way people will visit quacks who belong to the higher caste. Religion also greatly impacts on determining pluralistic therapy. Sometime Hindu patients will visit Muslims quacks and where as Muslim patient’s visits Hindu quacks. Nomadic quacks also found significant in curing various elements in some cases. For a time rural people will also visit tribal medicinal men. As Turner (1966) Points that ‘beginning of any health disorder is a direct result of impact on the social solidarity’. In this movement the selecting the medical system to solve the problem will play a vital role in the existing socialites. Ibara (2004) opined that “ The interchange of people and goods with ambient culture has configured the multicolored medical knowledge and healing practice on its own right in each different geographical and cultural context”. It is found that selecting a type of therapy is rural traditional health system has a bigger impact on both patient and at community level in the days to come.

**Keywords:** Health, Culture, Disease, Rural, Pluralism. - Nanjunda
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Keywords: Health, Culture, Disease, Rural, Pluralism. - Nanjunda
Case Report

SOMATOFORM AUTONOMIC DYSFUNCTION-A CASE REPORT

Savitha
Assistant Professor, Department of Mental Health / Psychiatric Nursing
Manipal College of Nursing Manipal, Manipal University Manipal - 576 104, Karnataka, India.

Correspondence :
Savitha
Department of Mental Health / Psychiatric Nursing, Manipal College of Nursing Manipal, Manipal University,
Manipal - 576 104, Karnataka, India.
E-mail : chaitrachandan@yahoo.co.in & savitha.umesh@manipal.edu

Abstract:
Somatoform disorders are characterized by a concern with the body and are among the most common reason for seeking medical help. Mr. X, a 47 year old male presented to the psychiatric department with persistent belching, fatigue and anxiety symptoms with autonomic arousal related to his work and health. Patient was treated with antipsychotics and cognitive behavioural therapy. Patient and family members were psycho educated about the illness.

Keywords : Somatoform disorders, somatoform autonomic dysfunction

Introduction:
Somatization is a clinical and public health problem as it can lead to social dysfunction, occupational difficulties and increased healthcare use\(^1\). Main feature is the repeated presentation of physical symptoms, together with persistent requests for medical investigations, in spite of repeated negative findings by doctors, that the symptoms have no physical basis\(^2\).

Somatoform Autonomic dysfunction, the symptoms are presented by the patient as if they were due to a physical disorder of a system or organ that is largely or completely under autonomic innervation and control, i.e. the cardiovascular, gastrointestinal, respiratory, and neurogenital systems\(^3\).

A case report:
A 47 year old male, married, from middle socio-economic status with no family history of mental illness, presented to the psychiatric unit with the complaints of recurrent belching, fatigue and anxiety since 2 ½ years. Initially client was admitted under medicine with the history of irrelevant talk, confusion and altered sleep wake cycle since 5 days after abrupt cessation of Tab. Haloperidol which had been prescribed by a local physician in view of persistent belching and was treated for management of delirium.

Following psychiatric consultation, Tab Bexol 4mg/day was started in view of Extra Pyramidal Symptoms and Tab. Quetiapine 50mg/day was started. After delirium began resolving and metabolic causes for the same were ruled out he was transferred to psychiatry. Subsequently Quetiapine was stopped once delirium had fully subsided and Tab Bexol was tapered to 2mg/day. He then reported persistent belching, fatigue and anxiety symptoms with autonomic arousal related to his work and health.

On Mental status examination, patient was alert and conscious. In the content of thought, patients reported that, I am worried about my belching whether it may be because of some illness. Anxious cognition about belching and somatic preoccupation was present.

Physical examination revealed that he was moderately built and nourished. Heart rate was 90b/mnt and BP-140/90mm Hg. Coarse tremors of both hands were present. Systemic examination was unremarkable.

Investigations showed normal CBC, RFT, LFT and urine examination. USG Abdomen was normal.

Keywords: Somatoform disorders, somatoform autonomic dysfunction - Savitha

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Quick Response Code

NUHS Vol. 3, No.4, December 2013, ISSN 2249-7110
Nitte University Journal of Health Science
Past history:
Patient has a history of several admissions since 2½ years in the local and tertiary care hospitals for belching, burning sensation in the epigastrium, fatigue and generalized weakness. He is a known case of Hypertension and Coronary Artery Disease since 3 years and on treatment. Six months back patient had consulted psychiatry with history of recurrent belching and sleep disturbances and nonpervasive low mood since 2 years at which time a diagnosis of Dysthymia with Somatoform Autonomic Dysfunction had been considered and he had taken Tab. Prothiaden 50mg 0-0-1 for a month however without significant improvement.

Patient is a known smoker and smokes about 10-12 beedi’s per day. There is no history of alcoholism or other substance use.

Treatment:
As the most distressing problem was belching Tab Nexipride 25mg HS was started. Cognitive behaviour therapy was provided. Patient and family members were counselled and psycho educated regarding the illness and treatment. Patient was discharged with following medications. Tab Bexol 2mg 1-0-0, Tab Nexipride 25mg 0-0-1, Tab Zapiz 0.5mg 0-0-1.

Nursing interventions:
- Ongoing physical assessment was carried out. Client was assisted in identifying the stress factors. Main stress factors found were loss in his flower shop business and his physical illness.
- Taught him an exercise program which included anxiety reducing techniques such as deep breathing, progressive relaxation techniques and listening to soothing music (instrumental).
- Discouraged day time napping and encouraged the client to participate in activities since patient also had sleep disturbance at night.
- Provided positive feedback for interacting with other clients in the ward
- Instructed client not to smoke during sleep time.
- Avoided positive reinforcement to his symptoms.
- Encouraged him to effectively use adaptive coping strategies during stressful situations.

Patient and family education:
- Advised patient to attempt to maintain interpersonal function despite of his symptoms since he had reduced interaction with others.
- Assured client that physical symptoms are not due to a defined disease which he has and it will often remit spontaneously.
- Motivated client to do stress reduction activities which may produce improvement in his physical symptoms.
- Educated the client and family members regarding the illness, importance of continuing the mediations and follow-up checkup.
- Emphasized that the family members should spend time with and pay attention to the patient when symptoms are absent.
- Family members are also encouraged to help the client by providing distraction activities if somatic symptoms are present, e.g., going for a walk or going out to the temple.

Discussion:
Patient had several episodes of admission with somatic complaints in the absence of positive investigations. In somatoform disorders, physical symptoms suggest a physical disorder, but there are no demonstrable organic findings and there is strong evidence for link to psychological factors or conflicts.

The patients present with multiple somatic complaints of several years duration, which are recurrent and frequently changing. He had complaints of recurrent belching, fatigue and anxiety. The common gastrointestinal symptoms include (e.g. abdominal pain, bowel problems, nausea, vomiting, belching, regurgitation, etc.).

Client was constantly reporting that, I am worried about my belching whether it may be because of some illness. Clients are convinced that they harbor serious physical problems despite negative results during diagnostic testing.

Alcohol and drug abuse are common in patients with
somatoform disorders. Patients may attempt to treat their somatic pain with alcohol or other substances. The present client has no history of alcoholism but he is a smoker. The client has a history of hypertension and coronary artery disease since 3 years. High prevalence rates of comorbid psychiatric disorders as well as a broad spectrum of psychiatric disorders in stable CHD outpatients was found in a study by Bettina Baniker et al. Client was admitted 2 years back to the psychiatric ward with the complaints of dysthymia. There is a high degree of comorbidity with depression and anxiety amongst people with somatoform disorders.

Conclusion:
Somatoform Autonomic Dysfunction is different from other somatoform disorders in that it centers around problems with a specific organ or section of the body. If diagnosed, therapy and counseling are two good options to help with treatment for Somatoform Autonomic Dysfunction.

References:
A CASE OF SPHENOID SINUS MUCOCŒLE FOLLOWING ENDOSCOPIC SINUS SURGERY FOR FUNGAL SINUSITIS

Satheesh Kumar Bhandary B. & Vadisha Srinivas Bhat

Professor, Associate Professor, Department of Otorhinolaryngology, K.S. Hegde Medical Academy, Deralakatte, Mangalore - 575 018, Karnataka, India.

Correspondence:
Satheesh Kumar Bhandary B.
Professor, Department of Otorhinolaryngology, K.S. Hegde Medical Academy, Deralakatte, Mangalore, Karnataka, India
Mobile : +91 9845130517     E-mail : sakubaraj@yahoo.com

Abstract:
Paranasal sinus mucoceles are common in frontal sinus, followed by ethmoid and maxillary sinuses. Sphenoid sinus is the least common site of mucocele, representing less than 2% of all paranasal sinus mucoceles. Here we present a case of sphenoid sinus mucocele, developing in a patient, who underwent endoscopic sinus surgery for fungal sinusitis involving the sphenoid sinus, presented with headache as the only complaint. The mucocele was diagnosed radiologically and was treated surgically by endoscopic sinus surgery.

Keywords: Mucocele; Sphenoid sinus; Fungal sinusitis; Headache; Endoscopic sinus surgery.

Introduction:
Mucocele of paranasal sinuses are benign cystic lesions lined by respiratory epithelium within the paranasal sinuses. They develop due to retention of mucoid secretions within a sinus, as a result of obstruction of the ostium of the sinus. The obstruction may be secondary to chronic sinusitis, trauma or prior surgery involving the sinus ostium. The retention of secretions lead to expansion of the bony walls of the sinus. However bony destruction is not common in mucoceles. Paranasal sinus mucoceles are commonest in frontal sinus, followed by ethmoid labyrinth and maxillary sinus. Mucocels involving sphenoid sinus is very rare representing less than 2% of paranasal sinus mucoceles. Diagnosis can be confirmed by imaging. Endoscopic surgery is the treatment of choice for this disease.

Case history:
A 50 year old man referred with history of headache of three months duration. He did not have any nasal symptoms other than headache. He was a diabetic being treated with oral hypoglycemics. While evaluating for headache, MRI brain was done which showed an iso to hypointense opacity involving the sphenoid sinus on T1 weighted images, with expansion of the bony walls. In T2 weighted images, the opacity was hyperintense (Fig 1). Nasal endoscopy did not show any abnormal findings in the nasal cavity. We performed Endoscopic sinus surgery, and fungal debris was cleared from the sphenoid sinus. Fungal culture showed aspergillus. Endoscopic cleaning of the sinus was done after a week and again after second and third weeks. Sinus mucosa was healthy and patient was symptom free for two years. After two years, he again came with history of headache of similar nature, without any other symptoms. Nasal examination was normal. MRI of paranasal sinuses showed iso to hyperintense signal on T1 weighted images and hyperintense signal in T2 weighted images. There was expansion of the walls of the sphenoid sinus, with extension of the lesion into the orbital apex, and also causing indentation of the temporal lobe in middle cranial fossa (Fig 2,3). Superiorly it was bulging into the suprasellar system. The pituitary fossa was thinned out and displaced posteriorly (Fig 4). Intersinus septum of sphenoid was not seen, as it was removed during the previous surgery. However, the bony walls were preserved without erosion anywhere. Radiological findings are consistant with a mucocele of the sphenoid sinus. Endoscopic sphenoid sinusotomy was done and the mucocele was marsupialized. Endoscopic clening was done after a week. Patient is under follow up for last five months and is symptom free during this period.
Keywords: Mucocele; Sphenoid sinus; Fungal sinusitis; Headache; Endoscopic sinus surgery. - Satheesh Kumar Bhandary B.

Discussion:
Mucocels of the paranasal sinus are encapsulated cystic lesions within a sinus. They develop as a retention cyst within a mucous gland of a sinus, or due to obstruction of sinus ostium resulting in accumulation of secretion and expansion of the bony walls of the sinus. Obstruction of sinus ostium are commonly due to chronic sinusitis; and occasionally due to prior surgery involving this structure. They are often seen in frontal and ethmoidal sinuses, and less often in maxillary sinus. Mucoceles involving sphenoid sinus are very rare, amounting to less than 2% of all paranasal sinus mucoceles. The case we presented here is a sphenoid sinus mucocele, developed in a patient surgically treated for fungal ball in the sphenoid sinus.

The symptoms of sphenoid sinus mucocele include ocular symptoms, headache, facial pain and nasal discharge. Clinical manifestations depend on the extension of the mucocele into the surrounding structures like optic nerve, optic chiasma, cavernous sinus, internal carotid artery, Pituitary fossa, Maxillary nerve and cranial nerves III, IV and VI. Soon SR et al in their series of 10 cases of sphenoid sinus mucoceles, found ocular symptoms are commonest (50%) followed by headaches(30%). Nugent GR et al found headache as the commonest symptom, followed by visual disturbance. Our patient had only headache as a presenting symptom, without any other nasal or occular...
symptoms, even though the mucocele was large, and on imaging was shown to extend into the orbital walls and indentation over the temporal lobe and pituitary fossa.

Diagnosis of sphenoid sinus mucocele can be confirmed with CT scan and MRI of paranasal sinuses, as the sinus per se is inaccessible to clinical examination. CT scan will delineate the limits of the mucocele and is useful in determining bone remodelling and bone erosion. Mucoceles do not enhance with contrast, except when inflamed causing a pyocele. MRI features of sphenoid sinus mucocele depend largely on the protein content. Some show hypointensity on T1 weighted images and hyperintensity on T2 weighted images. Sometimes there may be hyperintensity on both T1 and T1 weighted images. Hyperintensity is due to high protein content. Occasionally T2 weighted images may be hypointense owing to the presence of thick mucous.

Surgical decompression followed by marsupialization is the treatment of choice for sphenoid sinus mucocele, which can be well accomplished by the aid of endoscopes. The narial ostium of the sinus need to be widened to empty the content of the mucocele. Partial removal of the middle turbinate provides direct entrance into the sphenoid sinus through the anterior sinus wall. However this is not required in all cases, as we could open the sphenoid sinus without disturbing the turbinates. A second look endoscopic examination after a week is needed to clean the crusting near the widened ostium and to keep the ostium patent. Endoscopic surgery can also be combined with navigating system. Patient will be symptom free the next day after surgery with the release of pressure within sinus cavity. Recurrence is not seen in a case where a wide opening is created.

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Immediate partial denture prosthesis - A case report

Vinaya Bhat¹ & S. Sriram Balaji²
¹Professor, ²P.G. Student, Department of Prosthodontics and Implantology, A.B. Shetty Memorial Institute of Dental Sciences, Nitte University, Mangalore - 575 018. Karnataka, India.

Correspondence
Vinaya Bhat
Professor, Department of Prosthodontics and Implantology, A.B. Shetty Memorial Institute of Dental Sciences, Nitte University, Mangalore, Karnataka - 575 018, India.
Mobile : +91 94819 21180   E-mail : drvinayabhat@gmail.com

Abstract:
Prosthodontic management of a patient who requires immediate denture needs lot of understanding from the operator. Immediate dentures must be compatible both biologically and physiologically with the oral environment. Also the cooperation exhibited by the patient towards the treatment protocol also plays a major role in its success. This case report describes a patient treated with immediate partial denture prosthesis.

Keywords: Immediate partial denture, Immediate tooth replacement.

Introduction:
A plethora of options are available for the replacement of missing dentition. It presents a greater challenge when teeth have to be replaced immediately after extraction. Whether by implants or by conventional acrylic dentures, immediate replacement of teeth has its own difficulty. In spite of the difficulties involved immediate denture is always an able answer for replacing lost dentition. Immediate denture is a dental prosthesis constructed to replace the lost dentition and associated structures of maxilla and mandible and inserted immediately following removal of remaining teeth¹.

An immediate denture must be compatible both biologically and physiologically with the oral environment. It should restore mastication, speech and deglutition to as near normal as possible. It must also be aesthetically compatible and preserve the remaining oral tissues. Immediate denture presents numerous advantages¹ such as, a) the denture acts as a protective splint for the extraction wound and prevents injury, b) protection of the blood clot, c) no compromise in functions of oral cavity like speech, deglutition and mastication, d) no period of edentulousness for the patient and e) maintaining of vertical dimension of occlusion. Though the advantages are seemingly convincing, it also has disadvantages¹ like a) stimulation provided by the natural teeth is absent, b) it involves a precise and time consuming protocol, c) absence of anterior try for aesthetics.

All the aforementioned factors must be kept in mind before proceeding with the construction of immediate denture. In this article the authors describe a case report of an immediate denture prosthesis.

Case Report:
A male patient aged 52 years reported to the department of Prosthodontics, A B Shetty Memorial Institute of Dental Sciences, Mangalore, with the chief complaint of missing upper posterior teeth. Routine case history was recorded. It revealed that maxillary posterior teeth were extracted two years ago and were not replaced. A detailed Intra oral examination revealed grade III mobility of remaining natural teeth which made fabrication of conventional cast partial denture prosthesis impossible. Other treatment possibilities were explored accordingly and fabrication of immediate denture was finalized. The treatment protocol of the patient was divided into three phases namely a) Examination of the patient b) consultation and interview of
the patient c) treatment phase.

Initial patient examination included evaluation of local and systemic factors like condition of the teeth to be extracted, position of the teeth in the arch, presence of either bony or soft tissue undercuts and muscular coordination of the patient. Also various systemic conditions which pose threat for the fabrication of prosthesis were examined and ruled out accordingly. An orthopantomograph of the patient was procured (Fig 1). In the interview phase, the patient was explained about the procedure involved in the fabrication of the prosthesis. The expectation of the patient from the prosthesis was noted down. The role of patient in maintenance and care of the dentures were also explained at this phase of treatment planning.

Extra oral and intra oral photographs of the patient were made. Extra oral photographs included profile and frontal view (Fig 2a, 2b). Intra oral photographs of maxilla and mandible (Fig 3a, 3b) were made with special care of anterior teeth which helps in shade selection. The existing vertical dimension at rest and occlusion were recorded and noted down.

The primary impression was recorded using irreversible hydrocolloid and casts were poured using type IV dental stone. Base for the cast were fabricated as per necessary dimensions. Temporary denture base was made on maxillary cast using auto polymerizing acrylic resin and occlusion rims were constructed. Tentative jaw relations were recorded and a facebow transfer was done. The casts were mounted on a semi-adjustable articulator (Fig 4). The teeth to be extracted were marked on the cast represented by a cross mark using a black marker pen. This was done for easy identification of the teeth to be extracted when referred to an oral surgeon. Posterior try in was done and tentative jaw relation was verified. The teeth to be extracted were scraped on the cast using BP blade. It was scrapped in such a way that 2mm of the cast from the attached gingiva was removed (Fig 5a, 5b). This was done to compensate for the shrinkage of soft tissues post extraction. All the undercuts and sharp margins were rounded off on the cast. Teeth selection was done before extraction keeping in mind the shade, shape and size of the teeth to be extracted, to mimic them as far as possible. Then teeth arrangement was carried out and wax up was done (Fig 6). The denture was processed using heat polymerized acrylic resin.

Then the patient was referred to the Department of Oral and Maxillo Facial Surgery, A B Shetty Memorial Institute of Dental Sciences, Mangalore, for extraction of the specified teeth. Extraction of the teeth were done as atraumatically as possible and sutures were placed across the extraction socket. Then the denture was tried in mouth with utmost care to prevent injury to the extraction socket. All the sharp margins were rounded off. Occlusion was analyzed using articulating paper and premature contacts in the denture were removed. Care was taken to maintain the vertical dimension to the original height (Fig 7). Post denture insertion instructions were given to the patient. He was asked not to remove the dentures for 24 hours after the insertion of the prosthesis. This aids in stabilization of the blood clot that was formed. Also need for a soft diet was strictly emphasized for the patient. Then the patient was scheduled for a 24 hour recall appointment (Fig 8a, 8b & Fig 9a, 9b).

On 24 hour recall check up, patient did not show any discomfort while chewing and speaking. The patient was asked to continue using the prosthesis and was rescheduled after a week for further check up. After one week sutures were removed and healing was found to be satisfactory (Fig 10a, 10b). Patient was happy with the denture and its performance during mastication. Patient was kept on a regular recall schedule to improve the fit of denture upon healing.

**Discussion:**
Immediate dentures provide a valuable and reliable treatment option when proper case selection, treatment planning and other procedures are followed carefully. This article highlights the procedures involved in fabrication of immediate denture.

Success of this treatment procedure depends on various
Keywords: Immediate partial denture, Immediate tooth replacement.

- Vinaya Bhat
factors like case selection, diagnosis and treatment planning, meticulous surgical protocol, properly contoured and finished prosthesis and eagerness of the patient towards the treatment.

Case selection plays a major role in success of an immediate denture. Not all cases are eligible candidates for an immediate denture. This can be identified by initial examination of the patient. The patient must be free from medical conditions which may threaten the success of treatment.

The role played by oral surgeon in such a treatment procedure is very important. Good understanding between the prosthodontist and oral surgeon is essential. Teeth extraction must be carried out in a least traumatic way. Errors like fracture of cortical plate, tearing of muco periosteal flap must be avoided, which may reduce the rate of success of the treatment. When patients require total extraction and an immediate complete denture, a clear acrylic surgical stent may be fabricated to act as a guide to the surgeon while bone contouring. This will ensure a comfortable wearing of the prosthesis immediately after extraction.

Modification of cast at the intended area is very critical in the fabrication of an immediate denture. Standard used three pencil markings placed at a distance of 2mm each to assist in cast modification. Jerbi scribed three markings on the facial surface dividing it into cervical, middle and apical thirds. Recently Phoenix and Fleigel proposed spatial modelling technique for cast modification. Though there are numerous techniques proposed, they are aimed at providing space for prosthetic teeth and need for avoiding radical alveoloplasty.

A properly contoured and finished prosthesis greatly assists in healing of the wound. It will act as a stent or bandage to protect the wound from external trauma and prevents food debris and saliva coming in contact with the wound. Additionally it also protects the blood clot. Any sharp margins on the denture may cause inflammation of the oral mucosa which may cause an additional burden on healing which must be avoided. The cameo surface of the denture must be polished well so that food accumulation will be prevented and oral hygiene can be maintained easily by the patient. Also the denture must not exhibit any harmful forces on the ridge which may cause blanching of the underlying tissues. Pressure indicating pastes can be used in such cases to indentify the pressure spots in tissue surface of the denture and relieve them accordingly.

The patient’s cooperation towards the treatment also plays a major role in success. Philosophical patients are the best candidates for this kind of treatment procedure. To achieve this, the three stage treatment planning has to be done. In consultation interview phase all the procedures involved in fabrication of an immediate denture must be clearly explained to the patient. He/she must be psychologically counselled and motivated to accept the treatment. Also the expectation of the patient from the treatment must be addressed by the prosthodontist. As tissues heal after extraction there is a tendency of the dentures to lose their retention. Relining is necessary, which also has to be explained to the patient. Home care instructions for the patient must be verbally given and a written copy must be provided. Patient should be asked to report to the dental office if he/she has any discomfort with the prosthesis and it must be dealt with utmost care and attention.

All the above mentioned factors present a great role in success of this therapy. Also it must be kept in mind that this treatment option cannot be radically applied to all patients coming for replacement of missing teeth. When used and applied correctly immediate dentures serve the purpose with utmost success.

Acknowledgement:
The authors would like to acknowledge Dr. Prashanth Lowell Monis, intern, A B Shetty Memorial Institute of Dental Sciences, Mangalore, for rendering the surgical procedures as intended.
References:

Keywords: Immediate partial denture, Immediate tooth replacement.

Vinaya Bhat
UNDESCENDED CAECUM AND APPENDIX WITH RIGHT SIDED SIGMOID COLON - A CASE REPORT

Meera Jacob¹, Shivarama C. H.², Bindu S.³, Rani Nallathamby⁴ & Avadhani R.⁵

¹Assistant Professor, ²³Tutors, ⁴Associate Professor, ⁵Professor,
Department of Anatomy, Yenepoya Medical College, Yenepoya University, Deralakatte, Mangalore - 575 018.

Correspondence :
Ramakrishna Avadhani
Professor, Department of Anatomy, Yenepoya Medical College, Deralakatte, Mangalore - 575 018.
Mobile : +91 98452 53560     E-mail : rkavadhani@rediffmail.com

Abstract :
During routine dissection of abdomen for undergraduate students in Yenepoya Medical College, a male cadaver presented with variation in disposition of large intestine and inferior mesenteric artery. Caecum and appendix were present in the right lumbar region. The descending colon crossed the median plane in front of great vessels to the right side and then it continued as sigmoid colon in the right iliac fossa. Inferior mesenteric artery arose from right side of abdominal aorta to supply the left one third of ascending colon, descending colon and sigmoid colon.

Keywords: Descending colon, Sigmoid colon, Inferior mesenteric artery.

Introduction :
Congenital abnormalities of intestines are more common, like non rotation or mal rotation of the gut that result from incomplete rotation or fixation of the intestines¹. Large intestine extends from the ileocaecal valve to the anus. It forms a border around the loops of small intestine that are located centrally within the abdomen. Normally large intestine begins in the right iliac fossa as caecum from which vermiform appendix arises. The caecum becomes the ascending colon which passes upwards in the right lumbar region and hypochondriac region to the inferior aspect of liver where it bends to left forming hepatic flexure and becomes the transverse colon. This loops across abdomen with an anteroinferior convexity until it reaches left hypochondrium where it curves inferiorly to form splenic flexure and becomes descending colon, which proceeds through the left lumbar and iliac regions to become sigmoid colon in the left iliac fossa. The sigmoid colon descends deep into the pelvis and becomes rectum and ends in the anal canal at the level of pelvic floor.

The caecum, appendix, ascending colon and right two third of transverse colon are supplied by superior mesenteric artery. The left part of transverse colon, descending colon, sigmoid colon, rectum and upper part of anal canal is supplied by inferior mesenteric artery².

Case report :
During routine dissection of a cadaver for undergraduates at Yenepoya Medical college, we noticed a variation in which caecum and appendix were present in the right lumbar region. A short ascending colon extended upwards measuring 8 cm from the caecum, ended at hepatic flexure. Transverse colon measured about 25 cm passed to left side up to splenic flexure. The descending colon instead of passing vertically downwards crossed the median plane in front of great vessels to the right. Then it ran vertically downwards and continued as sigmoid colon in the right iliac fossa. The total length of descending colon was 30 cm. The redundant loop was covered with mesentery. Inferior mesenteric artery arose from the right side of abdominal aorta, it descended retroperitoneally along the right side of aorta as superior rectal artery and it gave sigmoid branches to right side.
**Discussion:**

Development of midgut is divided into 3 stages. In first stage intestinal loop rotates through an angle of 90 degree in an anticlockwise manner and in second stage it shows sequential reduction of the intestinal loop from physiological hernia at the end of tenth week, until the caecum reaches the subhepatic region. In third stage caecum and appendix grow caudally from subhepatic region, pass through right lumbar region and finally reach the definitive position in right iliac fossa. The total range of rotation around superior mesenteric artery is about 270 degree. When the rotation is complete the derivatives of midgut undergoes a process of fixation. Due to defects of fixation, the caecum and appendix may occur the subhepatic, right lumbar or pelvic region. This explains the presence of caecum and appendix in the right lumbar region in the present case.

Abdominal aorta gives three ventral branches to alimentary tract, the celiac trunk, superior mesenteric and inferior mesenteric arteries. The origins of three arterial trunks migrate caudally from their primitive positions due to growth of new caudal stems. So the origin of inferior mesenteric artery migrate from fifth thoracic to the third lumbar segment and it turns to left side. This theory explains the right sided course of inferior mesenteric artery to supply right sided sigmoid colon in the present case.

Right sided sigmoid colon has some surgical aspects in acute diverticulitis or carcinoma of sigmoid colon, which may be diagnosed as acute appendicitis. Symptoms that may arise from this condition are pronounced constipation, indefinite discomfort over the colon, indigestion, loss of weight, insomnia, pain and tenderness in the right iliac fossa caused by spasm proximal to the point of redundancy. Elongation and displacement of sigmoid colon to right side was noted in radiological studies and redundant loop of descending colon and right sided sigmoid colon was reported in cadavers also.
Conclusion:
In the present case, male cadaver presented with redundant loop of descending colon, right sided sigmoid colon and undescended caecum. This particular case adds to the knowledge of surgical anatomy. This variation should be kept in mind while undertaking any investigative or surgical procedures.

Acknowledgements:
The authors are grateful to Yenepoya University for permission to carry out this study.

References:
ANTHROPOIDAL POUCH TECHNIQUE FOR HIGHLY RESORBED RIDGES

Laxman Singh Kaira¹ & Esha Dabral²
¹² Consultant Dental Surgeon, Veer Chandra Singh Garhwal Government Medical Sciences and Research Institute, Srikot, Srinagar Garhwal, Uttarakhand

Correspondence
Laxman Singh Kaira
Flat No: 4, Faculty Residence, VCSGGMSRI, Srikot, Uttarakhand
Mobile: +91 87559 02525 E-mail: luckysinghkaira111@gmail.com

Abstract:
This article presents a case report on neutral zone technique used for treating a complete edentulous patient with resorbed ridges. It emphasizes on using materials available by the chairside to make impressions for resorbed ridges and to locate the neutral zone. It also presents certain modifications in technique for recording the neutral zone to achieving maximum prosthesis stability, comfort and function.

Keywords: Resorbed Ridges, Neutral Zone, Admix

Introduction:
The goal of dentistry is for patients to keep all their teeth throughout their lives in health and comfort. If the teeth are lost despite all efforts to save them, a restoration should be made in such a manner as to function efficiently and comfortably in harmony with the muscles of the stomatognathic system and the temporomandibular joints. With the increase in the life expectancy of the population, the numbers of complex complete denture cases also have been increasing. The treatment for these complex complete denture cases should be different from those of traditional complete dentures. In case of Atrophic mandible, Dental implants may provide stabilization of mandibular complete dentures, but in cases when it is not possible to provide implants on the grounds of medical risks, economic limitations or patients attitudes, an alternative technique should be thought¹. Providing complete denture therapy as a means of improving the denture foundation and supplementing the mechanics of prosthesis support, retention and stability. Regardless of implant availability, physiologically optimal denture contours and physiologically appropriate denture tooth arrangement should be achieved to maximize prosthesis stability, comfort and function for patients². This article tries to present a novel method to achieve the above mentioned denture qualities by simple usage of materials available by the chair side with every dental clinician.

Case report:
A 58 year old female patient reported to the Department of Dentistry Veer Chandra Singh Garhwal Government Medical sciences and Research Institute, Srinagar Garhwal, Uttrakhand, with a chief complaint of missing teeth, difficulty in speech, mastication and compromised esthetics. The patient gave a history of mild hypertension and denied any symptoms of TMJ disorder or myofacial pain dysfunction.

On clinical examination, the patient had no gross facial asymmetry or muscle tenderness. The mandibular range of motion was within normal limits. The

Keywords: Resorbed Ridges, Neutral Zone, Admix
asymptomatic. On intraoral examination the maxillary and mandibular arches were completely edentulous. No gross abnormalities were detected in the overall soft tissue of the lips, cheeks, tongue and oral mucosa. The maxillary and mandibular arches were severely resorbed (Atwood’s class IV) with shallow sulcus depth (Fig 1).

Treatment Objectives:
1. To rehabilitate the patient with complete denture therapy.
2. To achieve maximum prosthesis stability, comfort and function.
3. To locate the neutral zone and accordingly arrange the denture teeth and contour the complete denture polished surfaces.
4. To minimize the ongoing diminution of the residual alveolar ridges.

Treatment Procedure:
The patient was explained about the treatment procedure. As the residual alveolar ridges were resorbed and the sulcus depth was shallow, a good preliminary impression with impression compound was difficult to achieve. To overcome this problem a three step impression making was planned.

a) In the first step, alginate impressions of maxillary and mandibular arches were made using stock trays. The impressions were poured in dental plaster. Over this cast a double thickness full spacer (to provide space for impression material) and a custom tray was fabricated.

b) The custom tray was trimmed checked in patients mouth and then a preliminary impression was made using admix material (a mix of impression compound and greenstick compound in the ratio of 3:7) (Fig 2). Impressions were poured in dental plaster and a special tray was fabricated with a full spacer.

c) The special tray was trimmed and checked in the patient’s mouth and then the border molded with green stick and final impressions were made in zinc oxide eugenol impression paste.

d) On the master casts obtained record bases and wax occlusal rims were fabricated. Jaw relations were recorded and mounted on an articulator.

e) Following this the upper rim was removed and a second record base with a vertical occlusal stops and retentive loops to retain the material used to record the neutral zone was constructed. Similarly the lower record base was constructed.

f) These new record bases were trimmed and checked in the patient mouth and admix material was placed over the retentive loops and the neutral zone was recorded. During this procedure the patient was ask to make the movements like pucker the lips, swallowing and sucking to record the neutral zone as shown in (Fig 3).

g) The admix rims were relined with zinc oxide eugenol impression paste and over these rims plaster indices were constructed (Fig 4).

h) The admix material was removed from the record bases and the indices rearranged. Then wax flowed into the space to make an occlusal rim to conform to the patient’s neutral zone.

i) The teeth were arranged according to these rims and the try-in was performed in the patients mouth (Fig 5).

j) After try-in an external impression was made over the dentures using zinc oxide eugenol impression paste.

k) Following this the dentures were processed, trimmed, polished and denture insertion was done.

l) Post insertion instructions were given and patient recalled after 1 week (Fig 6).

Discussion:
The neutral zone philosophy is based upon the concept that for each patient there exists within the denture space a specific region where the function of the musculature will not unseat the dentures and where forces generated by the tongue are neutralized by the forces generated by lips and
cheeks. Since these forces were developed through muscular contraction during the various functions of chewing, swallowing they vary in magnitude and direction in different individuals. When the residual alveolar ridges have resorbed significantly, denture stability and retention are more dependent on correct position of teeth and contour of the external surfaces of dentures. Keeping these factors in mind, neutral zone method was used for this particular case. The advantage of this method is that the changes that might occur in vertical dimension during recording of the neutral zone can be prevented by the vertical occlusal stops. The entire procedure was aimed at using the materials that are available easily by the chair side with most of the clinicians.

**Conclusion:**
This article provides a novel approach in the management of completely edentulous patient with resorbed ridges. The technique described is simple which utilizes the routine materials used for denture fabrication, at the same time minimizing the errors and achieving the treatment goals.
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Keywords: Resorbed Ridges, Neutral Zone, Admix - Laxman Singh Kaira
Case Report

GINGIVAL DEPIGMENTATION: CASE SERIES FOR FOUR DIFFERENT TECHNIQUES

Sharath K.S.¹, Rahul Shah², Biju Thomas³, Shabeer Mohamed Madani⁴ & Shamila Shetty⁵

¹Professor, ²P G Students, ³HOD & Professor, ⁴Assistant Professor, Department of Periodontics, A.B. Shetty Memorial Institute of Dental Sciences, Nitte University, Deralakatte, Mangalore - 575 018, India.

Correspondence
Rahul Shah
Department of Periodontics, A.B. Shetty Memorial Institute of Dental Sciences, Nitte University, Deralakatte, Mangalore 575018, India
Mobile : +91 98868 67068     E-mail : dr.rahul_1987@hotmail.com

Abstract:
Gingival melanin pigmentation occurs in all races in variable amount caused by melanin granules. The degree of pigmentation varies from person to person. Excessive gingival pigmentation may be a major esthetic concern for many patients. Methods of de-epithelialization of the pigmented or discolored areas of gingiva using different methods such as scalpel method, bur method or laser method are well documented. The procedure for all three techniques has been described and evaluated here. Following presentation encloses a case series in which depigmentation of upper anterior gingival was carried out. The case presented with moderate to severe pigmented gingival (DOPI score ≥ 3) which were treated with one of the above mentioned techniques. The results of these cases suggested that ablation of the gingiva by a Diode laser, abrasion with a scalpel or rotary round bur is good enough to achieve esthetic satisfaction and fair wound healing without infection or severe pain.

Keywords : Bur abrasion, Depigmentation, Gingiva, Laser, scalpel technique.

Introduction:
A smile is a method of communication and is a mean of socialization and attraction. The harmony of the smile is determined by the shape, the position and the color of the teeth or lips as well as by the gingival tissues. Thus, gingival health and appearance are essential components of an attractive smile.¹ Review of literature suggested oral melanin hyper pigmentation an esthetic problems, caused by a variety of local / systemic factors including genetic factors, tobacco use; prolonged administration of certain drugs such as antimalarial agents and tricyclic antidepressant.²

The color of oral pigmentation varies depending on the quantity and depth or location of the melanin pigments.³ Melanin pigmentation is caused by melanin granules in gingival tissue, which are produced in melanosomes of melanocytes. Melanocytes are primarily located in the basal and suprabasal cell layers of the epithelium.⁴ In addition, the oral pigmentation is due to the activity of melanocytes rather than the number of melanocytes in the tissue.⁵,⁶,⁷ This pigmentation is seen among all races and at any age and it is without gender predilection.⁸ In dark-skinned or black individuals, an increased melanin production has long been known to be the result of genetically determined hyperactivity of melanocytes.⁹,¹⁰ Melanocytes of dark skinned or black individuals are uniformly highly reactive, whereas in light skinned individuals, melanocytes are highly variable in reactivity.¹¹,¹² In general, even though comparable numbers of melanocytes are present within their gingival epithelium, individuals with fair complexion will not demonstrate overt tissue pigmentation.

Although melanin pigmentation of the gingiva is completely benign and does not present a medical problem, complaints of 'black gums' or 'dark gums' are common. Dental treatment is usually sought for esthetic reasons, especially by fair skinned people having moderate or severe gingival pigmentation, mostly in patients with a high smile line. Gingival depigmentation is a periodontal...
plastic or esthetic surgical procedure whereby the gingival hyperpigmentation is removed or reduced by various techniques. For depigmentation of gingiva different treatment modalities have been reported like- Bur abrasion, scalpel method, cryotherapy, electrosurgery and laser.14 Hence the aim of our study was to compare four different depigmentation techniques for removing melanin pigmentation of gingiva.

Case reports:
Four patients [two male, two female], aged 20–25 years visited the Department of Periodontics, A.B.Shetty Memorial Institute of Dental Sciences, Mangalore, India for routine oral prophylaxis. On intraoral examination, diffused blackish pigmentation of gingiva was seen which was more prominent in the upper anterior region in all the cases. The unsightly gingival pigmentation was pointed out to the patients and they were made aware about the array of aesthetic treatment options available. The patients had also noticed the gingival pigmentation and of their own accord opted to undergo the depigmentation procedure. The patients' history revealed that the blackish discoloration of gingiva was present since birth, suggestive of physiologic melanin pigmentation. Clinical examination revealed pronounced bilateral melanin pigmentation. Their medical history was non-contributory. The patients were in good general health and there were no contraindications for the surgeries. Considering the patient's concern, gingival de-epithelization procedure was decided. Use of scalpel de-epithelization, bur abrasion with round bur or ceratip gingival trimming burs® (Kormet USA LLC)15, or laser method was planned.

Depigmentation procedures were planned after obtaining patients consent. All patients underwent phase-I therapy which included oral hygiene instructions, scaling and polishing. Depigmentation procedure was scheduled once inflammation was resolved. The procedure was carried out from premolar to premolar region.

Fig-I. Baseline: A. Patient 1: 23 years old female (DOPI score 3); B. Patient 2: 21-years-old female (DOPI score 3); C. Patient 3: 25 years old male (DOPI score 3); D. Patient 4: 23 years old male (DOPI score 4)

Scalpel technique (Surgical stripping method):22 After administering local anesthesia (lidocaine 2% with 1:80,000 epinephrine), the uppermost layer of the gingiva was carefully scraped using 15 number blade which was held parallel to the long axis of the teeth. Minimum force/pressure was used to avoid post-operative gingival pitting. Bleeding was controlled with a sterile gauze pressure pack. Surgical areas were covered with a periodontal pack and post-operative instructions were given. Analgesics were prescribed for the management of pain. After one week the pack was removed and the surgical area was examined. The healing was uneventful and satisfactory. No post-surgical complications were encountered.

Fig-II. Scalpel technique : A. preoperative view; B. Immediate post-operative; C. 10 days follow-up

Bur method:
A). Round diamond bur method:
For depigmentation with round diamond bur, revolving bur was used on the surface of pigmented gingiva and moved with feather light strokes without giving any pressure. It was not kept at one place for long time as it may result in thermal trauma and permanent harm to underlying tissue. Medium size round bur was used because small bur might produce small pits rather then surface abrasion. The bleeding was controlled and checked for any pigmented area remained and removed it to prevent relapse. Bleeding was stopped by applying pressure by a gauze piece on the denuded epithelium. Removal of gingival melanin pigmentation should be performed cautiously and the adjacent teeth should be protected, since inappropriate application may cause gingival recession, damage to underlying periosteum and bone, delayed wound healing, as well as loss of enamel.11

Fig-III. Bur abrasion: A. preoperative view; B. Immediate post-operative; C. 10 days follow-up

Keywords: Bur abrasion, Depigmentation, Gingiva, Laser, scalpel technique. - Rahul Shah
B). Ceramic gingival trimming bur method:

Suitable for use in various sectors of mucosa surgery, the tissue trimmer CeraTip® constitutes an ideal alternative to electrotomes, curettes and scalpels when it comes to depigmentation of gingiva. For depigmentation by CeraTip®, its tip should be applied to the tissue at 300000 – 450000 rpm without cooling. The tissue can be modeled without hardly any bleeding due to thermal coagulation caused by the rotational energy of the CeraTip®. However, there is the risk of injury due to jamming and slipping of the instrument.27

Keywords: Bur abrasion, Depigmentation, Gingiva, Laser, scalpel technique. - Rahul Shah
Fig-IV. Bur abrasion: A. preoperative view; B. Immediate post-operative; C. 10 days follow-up

Laser Method:
After applying topical anesthesia (lidocaine 15% topical aerosol USP), diode laser (810 nm) was used for depigmentation method. The gingival epithelium and part of connective tissue was used using pulsed mode. Pulse length and pulse interval were used for 80 microseconds. The tip was used moving brush stroke to prevent heating of the tissue. The area was irrigated using saline and was covered with periodontal dressing.

Fig-V. Laser ablation: A. preoperative view; B. Immediate post-operative; C. 10 days follow-up

Discussion:
Oral pigmentation occurs in all races of humans. There are no significant differences in oral pigmentation between males and females. The intensity and distribution of pigmentation of the oral mucosa may be variable, not only between races, but also between different individuals of the same race and within different areas of the same mouth. Physiologic pigmentation is probably genetically determined, but as Dummett suggested, the degree of pigmentation is also related to mechanical, chemical, and physical stimulation.

Melanin pigmentation is frequently occurring by melanin deposition by active melanocytes located mainly in the basal layer of the oral epithelium. Pigmentations can be removed for esthetic reasons. Different treatment modalities have been used for this aim. The selection of a technique for depigmentation of the gingiva should be based on clinical experience, patient's affordability and individual preferences.

It is known that the healing period for scalpel wounds is faster than other techniques; however, scalpel surgery causes unpleasant bleeding during and after the surgery, and it is necessary to cover the lamina propria with periodontal packs for 7 to 10 days.

The process of healing in bur method is similar to the scalpel technique. It is also comparatively simple, safe and non-aggressive method which can be easily performed and readily repeated, if necessary, to eradicate any residual repigmentation. Also, these techniques do not require any sophisticated equipment and are hence economical. Pre- and post-surgical care is similar to that of the scalpel technique. However, extra care should be taken to control the speed and pressure of the bur so as not to cause unwanted abrasion or pitting of the tissue. Feather light brushing strokes with minimum pressure and copious saline irrigation should be used without holding the bur in one place to get excellent results.

With laser, easy handling, short treatment line, homeostasis, sterilization effects and excellent coagulation (small vessels and lymphatics) are known advantages. Also, elimination of using periodontal dressing is possible by using laser. However, laser surgery has some disadvantages. Delayed type of inflammatory reaction may take place with mild post-operative discomfort lasting up to 1–2 weeks. Epithelial regeneration (re-epithelialization) is delayed (lack of wound contraction) as compared to conventional surgery. Also, expensive and sophisticated equipment makes the treatment very expensive. Another disadvantage is loss of tactile feedback while using lasers.

Conclusion:
Though the initial results of depigmentation procedure are highly encouraging, there is a chance of repigmentation. Documented chances of repigmentation after scalpel technique are 21.4%, and laser therapy are 22.8%. This process may be attributed to the fact that active melanocytes from the adjacent pigmented tissues might migrate to the treated areas. However it is safe to conclude that the procedure adopted should be simple, cost effective and less painful with minimal tissue loss and should be comfortable to the operator as well as patient.
References:


Keywords : Bur abrasion, Depigmentation, Gingiva, Laser, scalpel technique. - Rahul Shah
RENAL CELL CARCINOMA WITH OSSEOUS METAPLASIA OCCURRING IN A CONTRACTED KIDNEY - A RARE CASE REPORT

Harish S. Permi
Associate Professor, Department of Pathology, K S Hegde Medical Academy
Nitte University, Deralakatte, Mangalore 575018

Correspondence:
Harish S. Permi
Associate Professor, Department of Pathology, K.S. Hegde Medical Academy,
Nitte University, Deralakatte, Mangalore - 575 018
Mobile: +91 99641 31827     E-mail: drharish01@gmail.com

Abstract:
Osseous metaplasia is a rare histologic feature associated with renal cell carcinoma, occurring in a contracted kidney is still rarer. Metaplastic bone formation within the renal tumor gives an appearance similar to that of calcification. It is difficult to distinguish between bone formation and calcification on the basis of radiological imaging alone. Prognostic significance of metaplastic bone formation in renal cell carcinoma is not clear, however some report suggest good prognosis as a result of limitation of tumor spread by bone formation. This case report highlights the occurrence of renal cell carcinoma with osseous metaplasia in a contracted kidney.

Keywords: Renal cell carcinoma, Osseous, Metaplasia. Contracted kidney.

Introduction:
Renal cell carcinoma (RCC) may have calcifications within them. Heterotopic bone formation by ossification inside the renal tumor gives an appearance similar to that of calcification. \(^1\) Renal cell carcinoma accounts for 2% of total human cancers and the clear cell variant represents the most common histological subtype. All variants of RCC may exhibit necrosis and hemorrhage. Other degenerative changes that can be seen are edema, fibrosis, cholesterol clefts and calcification. Osseous metaplasia in RCC is, however a rare phenomena. \(^2\) A rare case report of renal cell carcinoma with osseous metaplasia in a contracted kidney occurring in a 38 year old male who presented with recurrent painless hematuria is presented here.

Case Report:
A 62-year-old male, presented with intermittent painless hematuria since 2 months. Urine analysis showed hematuria and proteinuria. Haematological and biochemical investigations were within normal limits. Ultrasonography (USG) of abdomen showed a mass in the right contracted kidney. Computerized tomography (CT) of abdomen revealed a heterogeneously enhancing mass measuring 2 x 1.5 cm with calcification located in the upper pole of right contracted kidney. Right nephrectomy was done and specimen sent for histopathological examination. Grossly kidney measured 5.5x4x3 cms. Outer surface showed irregular scarring. Cut section revealed an ill-circumscribed grey tan cystic growth with areas of hemorrhage and necrosis, occupying the upper pole measuring 2x2 cm with focal hard areas which were gritty to cut. Microscopy showed renal cell carcinoma with areas of bony trabeculae and adipose tissue suggesting metaplastic bone formation. [Figure 1] Sections from surrounding renal parenchyma showed chronic pyelonephritis. Fuhrman nuclear grade was grade 2. Gerotas fascia was free from tumor. He is on regular follow up with free of symptoms and recurrence.

Discussion:
Osseous metaplasia opposed to calcification is a rare finding. It has been demonstrated in several other tumors, including primary and metastatic colorectal carcinomas predominantly in mucinous tumors, benign rectal polyps, endometrioid carcinoma of the fallopian tube, malignant melanoma, breast carcinoma, hepatocellular carcinoma,
amyloid tumors of the breast and tonsil, fibrous histiocytoma and perineuroma [3]. The pathogenesis of ossification in tumors is not clear. Several hypotheses have been put forward, including the production of bone by tumor cells secondary to ischemia, necrosis or inflammation in the tumor or surrounding tissue, reparative responses in the tumor or surrounding tissues or the ossification of pre-existing mucin or calcification foci. A recent study has shown, Bone morphogenetic protein 2 (BMP2) to inhibit tumor growth of RCC and induce bone formation. [4] In our case there was pre-existing chronic pyelonephritis with occurrence of renal cell carcinoma which possibly suggests pathogenesis of osseous metaplasia. The prognostic significance of osseous metaplasia in RCC is debatable. Some reports show ossification to be a favourable prognostic factor with tumors having a low nuclear grade, low stage and absence of metastatic disease at presentation [5]. However, some reports suggest that ossification can also be associated with high grade tumors and poor prognosis. [6] Our case had a favourable prognosis due to low nuclear grade, early stage and absence of metastasis at presentation and no recurrence on follow up.

Conclusion:
Renal cell carcinoma with osseous metaplasia in a contracted kidney due to chronic pyelonephritis is a rare finding. It has a favourable prognosis with limitation of tumor spread. Chronic pyelonephritis possibly plays a role in pathogenesis of metaplastic bone formation.

References
INSTRUCTIONS TO AUTHORS

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(A) Review Articles:

- Reviews are written by researchers of considerable experience in the field concerned. The authors should review the recent trends or advances in that field in the light of their own work.
- The major portion of the above articles should deal with the up-to-date developments in the field in the 3 – 5 years. Authors are advised to search Medline and other databases on the internet, apartment from collecting information using conventional methods.
- These articles besides should contain a covering letter, title page, summary and keywords. The articles should be written under appropriate sub-headings. The authors are encouraged to use flow charts, boxes, cartoons, tables, photographs of good resolution and figures for better presentation. Some of the other details are given below:

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2. Abstract and key words
3. Introduction
4. Materials and Methods
5. Results
6. Discussion
7. Conclusion
8. Acknowledgement
9. References
10. Tables with captions separately
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Abstract and key words: It must start on a new page carrying the following information: (a) Title (without authors names or affiliations), (b) Abstract, (c) Key words, (d) Running title. It should not exceed 250 words excluding the title and the key words. The abstract must be concise, clear and informative rather than indicative.

The abstract must be in a structured form and explain briefly what was intended, done, observed and concluded. The conclusions and recommendations not found in the text of the article should not be given in the abstract.

Keywords: Provides 3-5 keywords which will help readers or indexing agencies in cross-indexing the study. The words found in title need not be given as key words. Use terms from the latest Medical Subject Headings (MeSH) list of Index Medicus. A more general term may be used if a suitable MeSH term is not available.

Introduction: It should start on a new page. Essentially this section must introduce the subject and briefly say how the idea for this research topic originated. Give a concise background of the study. Do not review literature extensively but provide the most recent work that has a direct bearing if any on the subject. Justification for research aims and objectives must be clearly mentioned without any ambiguity. The purpose of the study should be stated at the end.

Materials and Methods: This section should deal with the materials used and the methodology (how the work was carried out). The procedure adopted should be described in sufficient detail to allow the experiment to be interpreted and repeated by the readers, if desired. The number of subjects, the number of groups, the study design, sources of drugs with dosage regimen or instruments used, statistical methods and ethical aspects must be mentioned under the section. The data collection procedure must be described. If a procedure is a commonly used, giving a previously published reference would suffice. If a method is not
well known (though previously published) it is better to describe it briefly with due acknowledgement. Give explicit descriptions of modifications or new methods so that the readers can judge their accuracy, reproducibility and reliability.

The nomenclature, the source of material and equipment used, with details of the manufacturer in parentheses, should be clearly mentioned. Drugs and chemicals should be precisely identified using their non-proprietary names or generic names. If necessary, the proprietary or commercial name may be inserted once in parentheses. The first letter of the drug name should be small for generic name (e.g., diprydamole, propranolol) but capitalized for proprietary names (e.g., Persantin, Inderal). New or uncommon drug should be identified by the chemical name and structural formula.

The doses of drugs should be given as unit weight per kilogram body weight e.g., mg/kg and the concentrations should be given in terms of molarity e.g., nm or mM. The routes of administration may be abbreviated, e.g., intra-arterial (i.a), intracerebroventricular (i.c.v), intra-gastric gavage (i.g.), intramuscular (i.m), intraperitoneal (i.p), intravenous (i.v), per os (p.o), subcutaneous (s.c), transdermal (t.d), etc.

Statistical Methods: The variation of data should be expressed in terms of the standard error of mean (SEM) or the standard deviation (SD), along with the number of observations (n). The details of statistical tests used and the level of significance should be stated. If more than one test is used it is important to indicate which groups and parameters have been subjected to which test and why.

Results: The results should be stated concisely without comments. They should be presented in logical sequence in the text with appropriate reference to tables and/or figures. The data given in tables or figures should not be repeated in the text. The same data should not be presented in both tabular and graphic forms. Simple data may be given in the text itself instead of figures or tables. Avoid discussions and conclusions in the results section.

Discussion: This section should deal with the interpretation, rather than recapitulation of results. It is important to discuss the new and significant observations in the light of previous work. Discuss also the weaknesses or pitfalls in the study. New hypotheses or recommendations can be put forth. Avoid unqualified statement and conclusions not completely supported by the data. Repetition of information given under Introduction and Results should be avoided.

Conclusions: It must be drawn considering the strengths and weaknesses of the study. Make sure conclusions drawn should agree with the objectives stated under Introduction.

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