PLAQUE SCORE AND GINGIVAL HEALTH STATUS AMONG 6-12 YEARS OLD CHILDREN IN HYDERABAD DIVISION

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ABSTRACT

The objective of this study was to evaluate the plaque score and gingival health status among 6-12 years old school children. This cross sectional study was done from 15th July to 10th August 2014 among the students of Matiari (Rural Area) and Hirabad Hyderabad (Urban Area). Schools were selected on convenient basis. Age ranged from six to twelve years and only boys were included in the study.

All clinical dental examinations were conducted in schools with mouth mirror and explorer in the day light. Plaque index and gingival index developed by Loe and Silness were used for each student to record the plaque score and gingival condition. The plaque disclosing tablet (Eviplac Pastilhas; Biodinamicas TM), was used to identify the plaque score. All the students were asked about routine oral hygiene procedures.

Data were analyzed in statistical package for social sciences (SPSS) version 16. Quantitative variables are presented in percentages. Mean and standard deviations were computed for qualitative variables. Chi-square test and independent sample t-test were applied to see the significant association.

Total one hundred seventy six school children were included in this study; ninety six were from rural area and eighty from urban area. The mean age was 15.85 ± 7.773. The gingivitis was seen in 80.7% students. Gingivitis was more in the rural children than from urban areas which was statistically not significant. The mean plaque score was 39.63+19.15 in present study. The independent sample T-test analysis revealed no significant difference between rural and urban students. Gum bleeding was more common in rural school students which is statistically significant.

It is concluded that there was a higher gingival inflammation in present study population. Urban students had good gingival condition and low mean plaque score than rural students. Mild type of gingivitis was more common in rural students.

Key Words: Gingivitis, Plaque index, Periodontitis, Religious school children.

INTRODUCTION

The oral cavity of humans is a complex ecosystem inhabited by more than 300 bacterial species, mycoplasmas, protozoa, and yeasts. In the field of Dentistry gingivitis is frequently observed in patients who may or may not be aware of the pathological condition and its potential sequelae if not addressed. Gingivitis is inflammation of the gingivae without involvement of the deeper supporting tissues. The matter of concern is the evidence that periodontal tissue destruction can initiate over time in the absence of satisfactory oral hygiene and/or chemotherapeutic interventions. Causality is attributed to the gingival inflammation induced by increasingly virulent pathogenic microflora in undisturbed dental plaque biofilms, as reproducibly
demonstrated by Loe et al\textsuperscript{4,5} where oral hygiene habits modification is a difficult task.\textsuperscript{6,7} The Gingival Index grades the gingiva on the mesial, distal, buccal, and lingual surfaces of the teeth. Each area is scored on an ordinal scale of 0-3 according to the criteria given by Loe and Silness.\textsuperscript{8} Silness and Loe\textsuperscript{9} developed the Plaque Index to be used along with their GI. The same surfaces of the same teeth are scored as in the GI and a 0-3 ordinal scale is again used.

Gingival bleeding after gentle probing has become a standard measure of gingivitis in clinical trials. Although visual assessments of inflammation (color, swelling) are subjective, the appearance of spots of blood after the probe is gently run around the gingival margin is more sensitive\textsuperscript{10} and more objective in those sites that are difficult to view directly.\textsuperscript{11} Oral and Dental health care products marketing, which either reduce dental plaque and/or alter its microflora can be key adjuncts in patient care by preventing and controlling gingivitis and periodontitis.

Adequate mechanical removal of dental plaque can prevent and control the Dental disease.\textsuperscript{12} The most important factor to maintain oral hygiene is mechanical tooth brushing, and the frequently recommended twice a day.\textsuperscript{13} Pakistani public use a variety of devices for maintenance of oral hygiene; that includes tooth brush, toothpaste, tooth powder, chewing stick/Miswak. It has been proved that relatively stable pattern of tooth brushing get establish during childhood and adolescence.\textsuperscript{14}

The kids of six to twelve years age group is the period in which they have a higher desires, capabilities and capacities for learning and have rapid intellectual individual development and there are many positive attitudes/behaviors that need to be acquired in this age group.\textsuperscript{15} Generally Periodontal disease is the most common oral/Dental disease in Pakistan equally prevalent in urban as well as in Rural areas. Less than 28% of the children aged 12 years have been found to have healthy gingiva.\textsuperscript{16}

There are only few studies available regarding the Oral & Dental health status of students of Pakistani population and however latest data is not available so the purpose of present study is to evaluate the plaque score and gingival health status of students. This would ultimately upgrade their oral hygiene knowledge and understanding on health care issue and by improving the oral health status of the students will maintain

<table>
<thead>
<tr>
<th>Oral Cleaning Device</th>
<th>Rural n (%)</th>
<th>Urban n (%)</th>
<th>Total n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tooth Brushing Weekly but not regular</td>
<td>27 (28.1)</td>
<td>13 (16.2)</td>
<td>40 (22.7)</td>
</tr>
<tr>
<td>Miswak (Chewing Stick)</td>
<td>35 (36.4)</td>
<td>23 (28.7)</td>
<td>58 (32.9)</td>
</tr>
<tr>
<td>None</td>
<td>48 (61.5)</td>
<td>30 (38.4)</td>
<td>78 (44.3)</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>School</th>
<th>Normal</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
<th>P-value</th>
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</thead>
<tbody>
<tr>
<td>Normal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.285</td>
</tr>
<tr>
<td>Rural</td>
<td>14(16.6)</td>
<td>66(68.7)</td>
<td>15(15.6)</td>
<td>01(1.04)</td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>20(25)</td>
<td>43(53.7)</td>
<td>17(21.2)</td>
<td>00(00)</td>
<td></td>
</tr>
<tr>
<td>Total (%)</td>
<td>34(19.3)</td>
<td>109(61.6)</td>
<td>32(18.1)</td>
<td>01(1)</td>
<td>0.285</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Religious schools</th>
<th>Mean</th>
<th>Standard Deviation(SD)</th>
<th>P-value</th>
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<tr>
<td>Rural</td>
<td>45.13</td>
<td>21.265</td>
<td>0.285</td>
</tr>
<tr>
<td>Urban</td>
<td>33.03</td>
<td>13.700</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>39.63</td>
<td>19.150</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Gum Bleeding</th>
<th>Rural n (%)</th>
<th>Urban n (%)</th>
<th>Total n (%)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>74(77)</td>
<td>27(33.7)</td>
<td>101(57.3)</td>
<td>0.001</td>
</tr>
<tr>
<td>No</td>
<td>22(22.9)</td>
<td>53(66.2)</td>
<td>75(42.6)</td>
<td></td>
</tr>
</tbody>
</table>
their oral hygiene and, ultimately, the quality of their lives.

**METHODOLOGY**

Cross sectional study done from 15th July to 10th August 2014 among the religious students of Madrasa Jamia Ghousia Taheria Matiari (Rural Area) and Mumtaz ul Madaris Hirabad Hyderabad (Urban Area). The permission was obtained from the administrators of schools and from the Ethical committee of University. Schools were selected on convenient basis. Administrators were informed about the aims and objectives of the study. Verbal consent was taken from all the participants. Male students between age group 6-12 year were included in the study. Day scholars were excluded from the study. An oral examination was conducted by using mouth mirror and explorer in the day light, while sitting on a chair beside the window in schools. The plaque score and gingival health status were recorded for each child using the criteria of Plaque Index, and Gingival Index which was developed by Loe and Silness. Gingival Index score was considered as 0: Normal gingiva 1: Mild inflammation — slight change in color, slight edema; no bleeding on probing 2: Moderate inflammation — redness, edema, and glazing; bleeding on probing.

3: Severe inflammation — marked redness and edema; ulceration; tendency to spontaneous bleeding and Plaque score was considered as 0: No plaque in the gingival area. 1: A film of plaque adhering to the free gingival margin and adjacent area of the tooth. The plaque may only be recognized by running a probe across the tooth surface. 2: Moderate accumulation of soft deposits within the gingival pocket, on the gingival margin and/or adjacent tooth surface, which can be seen by the naked eye. 3: Abundance of soft matter within the gingival pocket and/or on the gingival margin and adjacent tooth surface.

All the students included in the study were asked to chew the plaque disclosing tablet (Eviplac Pastilhas; Biodinamica TM), swish it 30 seconds, spit out and asked for gargles once with tap water. Plaque score per student was calculated. This was done by dividing the sum of all plaque scores of all teeth by the number of tooth surfaces examined. Gingival bleeding was determined with periodontal probe by gentle probing of the gingival crevice to assure presence or absence of the bleeding. Bleeding from gums within 10 seconds indicated a positive score that was expressed as a percentage of the total number of gingival margins examined. For each individual each tooth one buccal and one lingual/palatal gingival margin were examined. All the students were asked regarding the routine oral hygiene habits.

Data were analyzed in statistical package for social sciences (SPSS) version 16. Quantitative variables like type of schools, prevalence of gingivitis and oral hygiene habits are presented in percentages. Mean and standard deviations were computed for qualitative variables like age and plaque score. Chi-square test was applied to see the association between categorical variables. T-test was applied to check the statistically significance of plaque score. The level of significance was set to > 0.05.

**RESULTS**

Total one hundred seventy six students were included in this study, ninety six from rural area and eighty from urban area. The mean age was 15.85 ± 7.773. The minimum age was 6 years and maximum age range was 12 years.

When asked about the oral hygiene habits, 27 (28.1%) of rural and 13 (16.25%) of urban students brushed their teeth weekly but not regularly and the use of Miswak was commonly noticed in rural children and this was used by 58(32.9%) students. A big proportion 78(44.3%) of respondents reported that they were not using any oral cleaning device (Table 1). The overall gingivitis was seen in 80.7% students. Gingivitis was more in the rural students than urban students which is statistically not significant (Table 2).

The mean plaque score was 39.63±19.15 in this study. The T-test analysis revealed no significant difference between rural and urban students (Table 3). Gum bleeding was more common in rural school students which is statistically significant (Table 4).

**DISCUSSION**

Gingivitis is considered a very significant precursor for periodontitis. The results of this research showed a higher occurrence of gingival inflammation, which is in agreement with other studies, and it can be attributed to the poor oral hygiene. The data showed that the mild type of gingivitis had the highest percentage among the students, this was in agreement with other studies and in disagreement with AL-Sayyab's study and it may be due to the fact that the commonest type of gingivitis in early childhood is the mild one and that the severity increases with age.

The mean score for plaque was 39.63 ± 19.15 for the 6-12 year old students which is not in agreement with the study conducted on 6 14 year children in study of Sana’a. In present research the students from urban school showed lower mean plaque score than rural school children which is in agreement with others. The lower mean plaque score in urban students and the variations in score may be attributed to differences in methodology or age of study samples and may also reflect genuine differences in oral hygiene practices, culture, and food habits.

The results of present study indicated that 57.3% of 6-12 years-old school students had gum bleeding. In
acccordance to this, one of the study aimed at knowing the complained of gum bleeding among school children in Lithuania discovered that more than half (55.9%) of respondents reported gum bleeding.27

CONCLUSION

There was a higher prevalence of gingival inflammation and higher mean plaque score in present study population, where Oral hygiene is not maintained properly. Urban students had good gingival condition and low mean plaque score than rural students. There was highest incidence of mild type of gingivitis.

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