Dental caries and Oral Hygiene Status of school children in Davangere related to their Socio - Economic levels : An Epidemiological study.

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Dental caries and periodontal disease, the most commonly seen disease show striking geographic variation, socio-economic patterns and severity of distribution all over the world. Hence, an attempt has been made to determine the relationship of oral health status with socio-economic status in Davangere town. A total of 2007 children of 13 to 14 years age belonging to both sexes were examined. Type III examination was carried out during the survey. DMF caries Index and Oral Hygiene Index was used to assess caries experience and oral hygiene status. Prasad’s classification was used to know the social classification of the children. It was concluded that dental caries experience and oral hygiene status of children are strongly correlated to Socio-economic status.

Key Words : Dental Caries, Oral Hygiene status, Socio-Economic status

INTRODUCTION

Dental caries and periodontal disease, the most commonly seen oral disease show striking geographic variation, socio-economic patterns and severity of distribution all over the world1-5.

Number of factors have been put forward to explain the variation in prevalence and severity of dental caries and periodontal disease that can be found between developing and technically developed countries, but also between rural and urban communities.

Additionally, there is marked variability in the pattern of many disease between different socio-economic groups in the same country.

In recent studies, socio-economic factors have been identified as predisposing factors in the development of both dental caries and periodontal disease6-9. Low income and poor education have been reported to influence periodontal status10.

Research in industrialized countries has revealed that children of high social class families experience less caries than those of lower social classes11. However, this relationship appears to be reversed in the developing countries3. Hence an attempt has been made to determine the relationship of oral hygiene status and dental caries experience with socio-economic status in Davangere, India.

AIMS AND OBJECTIVE

To investigate whether socio-economic status would change the pattern of dental caries experience and oral hygiene status among school going children.

MATERIAL AND METHODS

A total of 2007 children of 13 and 14 years age, males (1062) and females (945) were included in the study. The children were divided into 5 groups depending upon their socio-economic status. Consent from the respective school authorities was obtained prior to commencement of the study.

School going children of 13 and 14 years old, of both the sexes were selected in order to have a good representation of all school going children of Davangere Urban area. A total of 11 schools were selected by stratified random
sampling method. A total of 2056 children were examined out of which 49 children who were undergoing orthodontic treatment were excluded from the study.

A proforma was prepared to collect the data about the oral Health status of the subjects. The proforma consisted of general information, oral hygiene habits and the economic status, which was obtained from the school records.

Oral hygiene status and dental caries was recorded by clinical examination using relevant indices. The type III examination was carried out during the survey. The oral hygiene status was assessed by using Oral Hygiene index simplified (OHI-S) by green and Vermillion in 1964. To record the caries experience decayed, missing and filled (DMF) caries index was used. Both DMFT and DMFS was recorded.

All children were examined by one examiner on an average of 110-130 students/day in the morning. 15 students of the previous day were examined again on the next day to eliminate intra examiner variability, one doctor assisted throughout the study in making entries into the survey form.

STATISTICAL ANALYSIS

Statistical methods employed in this study are mean, standard deviation, and standard error. Comparison of mean levels of two groups (Relative deviate), comparison for more than two groups (analysis of variance-one way classification).

SOCIO-ECONOMIC STATUS OR SOCIAL CLASSIFICATION

All over the world the social scientists have considered occupation as the most important determinant of the level of social standing of an individual in society. In India, Prasad's classification of 1961, further modified in 1968 and 1970 is based on per capita income is used. The income limits emphasize only the need for updating this classification with time. Realizing this need, P.Kumar linked Prasad's classification (1961) with the All India consumer price Index (AICPI) as both of them shared the same base year of 1961.

To update the social classification the following is used:

\[
\text{Social class} = \frac{\text{Value of CPI} \times 4.93}{100}
\]

Where CPI=Consumer Price Index

4.93 = A multiplication factor, which transforms current values of CPI into a hypothetical value of CPI in relation to the base year of 1961.

Table 1: Shows The Proposed Social Classification For The Month Of February/March 1997.

RESULTS

A total of 2007 children of 13 and 14 years old belonging to both sexes, males (1062) and females (945) were included in the study.

Table-2 presents the distribution of the children according to socio economic status.

Table-3 presents the mean, and standard deviation of DMFT, DMFS and its components.

Table-4 presents the mean, standard deviation of OHI-S and its components by socio economic status.

<table>
<thead>
<tr>
<th>Social Class</th>
<th>Monthly Income Limits (Rs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prasad’s Classification (1961)</td>
<td>Modified proposed classification for the month of February / March 1997</td>
</tr>
<tr>
<td>I</td>
<td>100 &amp; Above</td>
</tr>
<tr>
<td>II</td>
<td>50 - 99</td>
</tr>
<tr>
<td>III</td>
<td>30 - 49</td>
</tr>
<tr>
<td>IV</td>
<td>15 - 29</td>
</tr>
<tr>
<td>V</td>
<td>Below 15</td>
</tr>
</tbody>
</table>

Table No.1 : Shows The Proposed Social Classification For The Month Of February / March 1997.
Table No.2 : Presents the Distribution of the Children According to Socio Economics Status.

<table>
<thead>
<tr>
<th>S.E.S</th>
<th>Income Calculate per Month in Rupees</th>
<th>No. Of Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>1900 and above</td>
<td>350</td>
</tr>
<tr>
<td>II</td>
<td>950 - 1899</td>
<td>477</td>
</tr>
<tr>
<td>III</td>
<td>570 - 949</td>
<td>341</td>
</tr>
<tr>
<td>IV</td>
<td>285 - 569</td>
<td>366</td>
</tr>
<tr>
<td>V</td>
<td>Below 284</td>
<td>473</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>2007</td>
</tr>
</tbody>
</table>

Table No.3 : Presents the Mean and Standard Deviation of DM FT, DMFS and Its Components.

<table>
<thead>
<tr>
<th>S.E.S.</th>
<th>No.Of Cases</th>
<th>DT</th>
<th>MT</th>
<th>FT</th>
<th>DMFT</th>
<th>DS</th>
<th>MS</th>
<th>FS</th>
<th>DMFS</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>350</td>
<td>2.56±2.38</td>
<td>0.05±0.26</td>
<td>0.54±1.26</td>
<td>3.15±2.57</td>
<td>3.06±3.16</td>
<td>0.23±1.34</td>
<td>0.64±1.51</td>
<td>3.93±3.8</td>
</tr>
<tr>
<td>II</td>
<td>477</td>
<td>2.54±2.46</td>
<td>0.07±0.31</td>
<td>0.22±0.76</td>
<td>2.83±2.55</td>
<td>3.08±3.38</td>
<td>0.34±1.59</td>
<td>0.30±1.15</td>
<td>3.72±4.09</td>
</tr>
<tr>
<td>III</td>
<td>341</td>
<td>2.59±2.37</td>
<td>0.09±0.42</td>
<td>0.17±0.67</td>
<td>2.85±2.48</td>
<td>3.13±3.30</td>
<td>0.43±2.11</td>
<td>0.28±1.31</td>
<td>3.84±2.84</td>
</tr>
<tr>
<td>IV</td>
<td>366</td>
<td>2.61±2.50</td>
<td>0.10±0.37</td>
<td>0.11±0.56</td>
<td>2.83±2.58</td>
<td>3.26±3.55</td>
<td>0.52±1.85</td>
<td>0.13±0.78</td>
<td>3.91±4.28</td>
</tr>
<tr>
<td>V</td>
<td>473</td>
<td>3.30±2.82</td>
<td>0.13±0.53</td>
<td>0.06±0.36</td>
<td>3.49±2.94</td>
<td>4.09±4.00</td>
<td>0.64±2.63</td>
<td>0.07±0.41</td>
<td>4.80±5.16</td>
</tr>
<tr>
<td>Significance P Value</td>
<td>&lt;0.01</td>
<td>&lt;0.05</td>
<td>&lt;0.001</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
<td>&lt;0.05</td>
<td>&lt;0.001</td>
<td>&lt;0.05</td>
<td></td>
</tr>
</tbody>
</table>

Table No.4 : Presents the Mean and Standard Deviation of OHI-S and Its Components by socio-economic status.

<table>
<thead>
<tr>
<th>S.E.S.</th>
<th>No. of cases</th>
<th>D.I-S.</th>
<th>C.I-S.</th>
<th>OHI-S</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>350</td>
<td>0.77±0.32</td>
<td>0.36±0.52</td>
<td>1.13±0.72</td>
</tr>
<tr>
<td>II</td>
<td>477</td>
<td>0.84±0.33</td>
<td>0.46±0.55</td>
<td>1.30±0.78</td>
</tr>
<tr>
<td>III</td>
<td>341</td>
<td>0.90±0.37</td>
<td>0.56±0.60</td>
<td>1.46±0.85</td>
</tr>
<tr>
<td>IV</td>
<td>366</td>
<td>0.93±0.37</td>
<td>0.63±0.69</td>
<td>1.56±0.93</td>
</tr>
<tr>
<td>V</td>
<td>473</td>
<td>0.99±0.37</td>
<td>0.80±0.68</td>
<td>1.79±0.91</td>
</tr>
<tr>
<td>Significance P Value</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td></td>
</tr>
</tbody>
</table>
DISCUSSION

Oral health is a part of general health and hence affects the total well-being of individuals. We know that dental and oral diseases affect various aspects of quality of life.

Dental caries is a disease of multi factorial aetiology and the major factors known to be concerned with development of the disorder are nature of the availability of suitable nutrients for the microbial organisms, in general terms these factors can be divided into local intra oral factors which are associated with plaque accumulation and metabolism and fluoride exposure or into more general factors such as age, sex, and socio-cultural or socio-economic variables. In recent studies, socio-economic factors have been identified as predisposing factors in the development of both dental caries and periodontal disease.

The present study shows that economic status is one of the contributing factors for developing dental caries. Low prevalence of dental caries was found among socio-economic status (SES) group I and II and it has steadily increased up to socio-economic status V group, the mean decayed teeth of socio-economic status I and II group was 2.56 and 2.54 respectively while socio-economic status V group recorded a highest mean decayed both of 3.30. This is accord with studies conducted by Anderson R.J., Arbinda Dutta, Dummer M.H. and Warnakula Suriya. This suggests that the caries experience deteriorated with socio-economic status.

The mean missing tooth has steadily increased from 0.05, 0.07, 0.09, 0.10 and 0.13 with S.E.S.I,II,III,IV&V group respectively. These findings are consistent with the findings of Antoff P.E., Havold D.S. and Marines Angulo. The mean filled teeth has decreased by 50 times as the economic status is decreased. The mean filled teeth of S.E.S.I,II,III,IVand group was 0.54, 0.22, 0.17, 0. Hand 0.06 respectively suggesting that as the S.E.S. increased the filled tooth component is also increased. This result correlates with the studies conducted by Antoff P.E., Havold D.S. and Marina Angulo.

The mean DMFT, DMFS and in components were statistically significant.

One of the WHO Oral health goals by 2000 is to attain a global average of no more than 3 decayed missing or filled teeth, in the present study S.E.S. I,II,III and IV groups are well below the WHO global average expect S.E.S.V group in which they recorded a mean decayed tooth of 3.30 and mean DMFT of 3.49.

The differences in the decayed teeth, missing teeth and filled teeth of the five S.E.S. groups might be due to the benefit of preventive measures, early diagnosis and specific treatment which are affordable by the high economic group children than the middle and low economic group children.

Studies have shown that as the social class deteriorated with economic status, the status of oral hygiene also varied. In the present study also the same findings were found. The OHI-S and its components were increased in their mean value steadily as the economic status decreased. The lowest score was seen in S.E.S. group I.

As research in industrialized countries has revealed that children of high social class families experience less caries than those of lower social classes. However, this relationship appears to be reversed in the developing countries. This variation in caries experience and the oral hygiene status in various socio-economic groups are usually explained by differences in oral habits, sugar consumption, use of fluoride in its various forms and oral hygiene practices addition to this utilization of oral health services has been related to social class differences in caries experiences. In Brazil it has been seen that access to dental care varies among social groups Children from low S.E.S. groups receive irregular care through the school dental services mostly on a pain relief basis. On the other hand most of the children from higher socio-economic groups receive regular dental check ups and treatment through the private systems.

Oral health has made remarkable progress in most developed countries, as a result of the rapid advances in the field of preventive dentistry. However, the situation is beginning to deteriorate in many developing countries, where the oral diseases are on the increase and the treatment are spiraling. The primary objective of preventive dentistry
is health promotion by dental health education.

It is concluded from the present study that caries experience and occurrence of untreated caries lesions in secondary teeth and oral hygiene status of children are strongly correlated to socio-economic status.

The school population of today is the adult of tomorrow; they should be educated, so that a sense of responsibility would develop in them about oral health. Studies on oral health assessment and dental health education of children at an early age helps in improving preventive dental behaviour and attitudes, which is beneficial for a lifetime. Exploring the links between clinical conditions, their personal and social outcomes not only promotes a more complex appreciation of oral health, it also provides the opportunity to identify interventions to minimize the consequences of oral diseases by conducting school dental health programmes.

Knowledge imparted through these programmes, would go a long way in maintenance of oral health.

REFERENCES

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