Oral hygiene practices and periodontal health among brass Industry workers and general population of Moradabad city, India

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Abstract
Objective: To assess as well as compare the oral hygiene practices and periodontal health among industrial and non-industrial populations of Moradabad city. Methods: A total sample of 100 subjects participated in the study with 500 subjects being randomly selected from brass industries and general population each. All the subjects were in the age group of 30-50 years and the workers with 5 years working experience were only considered for inclusion. Periodontal health was assessed with Community Periodontal Index (CPI) while oral hygiene practices and demographic data were recorded using a pre-designed questionnaire. SPSS version 15.0 statistical package was used for statistical analyses. Results: Bleeding and calculus were most prevalent periodontal indicators in both the groups; approximately there were double the number of subjects in industrial workers group (10.2%) with shallow periodontal pockets than the general population (5.6%). None of non-industrial subjects presented deep periodontal pockets whereas 0.6% industrial workers had deep periodontal pockets. None of the study subjects had excluded sextants. There were no significant differences between the study groups for oral hygiene frequency. Conclusions: Periodontal status of brass industry workers was found to be poor than the general population. Tooth cleaning frequency did not differ significantly between the industrial workers and general population.

Key words: Brass industry; CPI; Periodontal health.
Periodontal status of industrial workers

Introduction
Industrial revolution has made rapid strides in expanding industrial activity worldwide providing scope in employment for many and thus improving the standard of living of the people. In the light of rapid economic growth and industrial progress in our country, it becomes imperative that safety and health at the workplace be given its due importance. Majority of people employed in various industries are exposed to hazardous environment. This exposure deteriorates the general and oral health of people, working in industries for long hours. Every occupation is associated with one or other ill effects on health. Studies have shown the associations between occupational exposure and greater incidence of oral diseases (1-3). So, it is necessary to consider the ignorance of employees about their real oral condition and there is urgent need of an efficient policy for workers’ health (4). It was observed that the risk factors for oral diseases in workers are age, educational level, smoking and general health status (5).

Oral health behavior and seeking oral health care depends upon a number of factors. Patients comply better with oral health care regimens when informed and positively reinforced. Lack of information is among the reasons for non-adherence to oral hygiene practices. Further, oral health attitudes and beliefs are significant for oral health behavior. A higher likelihood of seeking preventive dental care is found to be associated with dental health knowledge. The motives prompting workers to seek preventive dental care include the beliefs that one is susceptible to dental disease that dental problems are serious, and that dental treatment is beneficial (6).

The CPI has been widely used for epidemiological purposes and for the WHO Global Oral Data Bank. Although use of CPI has been criticized for not including the cumulative effects of periodontal disease over time (loss of attachment, recession), it has been suggested that the index may be useful for describing periodontal health and also the changes in index values in the same population over time (7). The present study location, Moradabad is branded as the “Brass city” of India, which comprises of the people working in these industries. Lifestyle plays an important role in maintaining the normal integrity and natural functioning of the body. The literature on the dental awareness and dental health behavior among the industrial employees in Moradabad is also not available in the published dental literature. Hence, this study intended to assess as well as compare oral hygiene practices and periodontal health status among the brass industry workers and non-industrial population of Moradabad city.

Material and methods
The study done was a comparative survey in which the periodontal health status of brass industry workers was compared with non-industrial population i.e. the general population residing in Moradabad. A pilot study was conducted on eight brass industrial and non industrial workers to find out the feasibility of the study. Periodontal health status was assessed among them using CPI (1997) (7). Based on the findings with standard error of 1%, sample size was estimated as 500 in each group. A Single investigator was trained and calibrated for recording the periodontal health status and standardization was carried out to minimize the intra examiner error. Sixteen brass industries were enlisted by visiting each factory and 8 industries were picked up by simple random sampling lottery method. The workers aged 30-50
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years in the production line i.e., who are actively participating in manufacturing and finishing of brass articles with five years of working experience were considered for inclusion.

Non industrial population were included from dental camps organized for general population in Moradabad city. A pre-designed questionnaire was used to collect demographic information and the oral hygiene practices. Ethical clearance was obtained from ethical committee of Kothiwal Dental College and Research Centre, Moradabad. Informed consent was also obtained from each participant before conducting clinical examination.

Statistical tests were performed using Statistical Package for Social Sciences (SPSS), version 15.0. Chi-square test was used to compare the proportions. Confidence interval (CI) of the study was kept at 95% hence the p value less than 0.05% denoted statistically significant.

Results

Among the non-industrial population 72.4% belonged to 30-40 years and 27.6% belong to 41-50 years whereas in brass workers 80% belonged to 30-40 years age group and nearly 20% were in the age group 41-50 years (table1).

Table 1: Distribution of study population according to age group

<table>
<thead>
<tr>
<th>Age group</th>
<th>General population</th>
<th>Industrial workers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age</td>
<td>38.28±4.22</td>
<td>37.30±4.20</td>
<td>37.79±4.24</td>
</tr>
<tr>
<td>30 - 40</td>
<td>362(72.4%)</td>
<td>400(80%)</td>
<td>762(76.2%)</td>
</tr>
<tr>
<td>41 - 50</td>
<td>138(27.6%)</td>
<td>100(20%)</td>
<td>238(23.8%)</td>
</tr>
</tbody>
</table>

Table 2 depicts that bleeding and calculus were most prevalent periodontal indicators in both the groups, approximately there were double the number of subjects in industrial workers group (10.2%) with shallow periodontal pockets than the general population (5.6%). None of non-industrial subjects presented deep periodontal pockets whereas 0.6% industrial workers had deep periodontal pockets. None of the study subjects had excluded sextants.

Table 2: CPI scores in Industrial workers and general population

<table>
<thead>
<tr>
<th>CPI Score</th>
<th>General population n (%)</th>
<th>Industrial workers n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy</td>
<td>28(5.6)</td>
<td>33(6.6)</td>
</tr>
<tr>
<td>Bleeding</td>
<td>261(52.2)</td>
<td>232(46.4)</td>
</tr>
<tr>
<td>Calculus</td>
<td>183(36.6)</td>
<td>181(36.2)</td>
</tr>
<tr>
<td>Shallow periodontal pockets (4 – 5 mms)</td>
<td>28(5.6)</td>
<td>51(10.2)</td>
</tr>
<tr>
<td>Deep periodontal pockets (6 mm or more)</td>
<td>0(o)</td>
<td>3(0.6)</td>
</tr>
<tr>
<td>Excluded sextants</td>
<td>0(o)</td>
<td>0(o)</td>
</tr>
</tbody>
</table>

Chi square=13.52,(df = 5); p = 0.018

Table 3: Distribution of study population according to frequency of cleaning Teeth

<table>
<thead>
<tr>
<th>Frequency of cleaning teeth</th>
<th>General population n (%)</th>
<th>Industrial workers n (%)</th>
<th>Total n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Once</td>
<td>478(95.6)</td>
<td>465(93.0)</td>
<td>943(94.3)</td>
</tr>
<tr>
<td>Twice</td>
<td>20(4.0)</td>
<td>33(6.6)</td>
<td>53(5.3)</td>
</tr>
<tr>
<td>After every meal</td>
<td>2(0.4)</td>
<td>2(0.4)</td>
<td>4(0.4)</td>
</tr>
</tbody>
</table>

Chi square=3.368 (df =2); p=0.186

Majority of respondents in both the study groups used to clean their teeth once a day. Only 20 (4.0%) subjects in non-industrial group and 33 (6.6%) subjects in brass group used to clean their teeth twice a day as illustrated in table 3. Frequency of cleaning teeth after every meal was very low in both the groups and there were no significant differences between the study groups for oral hygiene frequency. It is clear from table 4 that 922 out of 1000 subjects (92.2%) used toothbrush for cleaning their teeth while 78 (7.8%) used finger to clean their teeth.

Among non-industrial subjects, proportion of subjects using finger (n=49; 9.8%) was significantly higher as compared to brass industry subjects.
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(n=29; 5.8%). The number of subjects using tooth brush was significantly greater among industrial workers than the general population.

Table 4: Distribution of study population according to method of cleaning their teeth

<table>
<thead>
<tr>
<th>Method of cleaning teeth</th>
<th>General population n(%)</th>
<th>Industrial workers n(%)</th>
<th>Total n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toothbrush</td>
<td>451 (90.2)</td>
<td>471 (94.2)</td>
<td>922 (92.2)</td>
</tr>
<tr>
<td>Finger</td>
<td>49 (9.8)</td>
<td>29 (5.8)</td>
<td>78 (7.8)</td>
</tr>
</tbody>
</table>

$\chi^2 = 5.562$ (df=1); p=0.018

Discussion

Health has evolved over the centuries as a concept from an individual concern to a world-wide social goal and encompasses the whole quality of life. Every work place is really a work environment where there are interactions between people and the chemical and physical demands involved with performing job (8). The present study was a cross sectional survey done to assess and compare the periodontal health status of brass industry workers with general population of Moradabad city. In our study both the industry workers and general population had higher CPI scores. The results of our study are in accordance with the studies done on factory workers in China (9) and in Brazil (10) which observed that calculus was the commonest finding among industrial workers (11). Furthermore, it was observed the prevalence of periodontal pockets was more among the industrial workers than the general population. These findings are in agreement with the study conducted among industrial workers in Davangere city, Karnataka where the periodontal disease prevalence reported among workers was higher compared to general population (11). The probable reason for this could be the presence of metallic dust in the plaque and calculus of industrial workers which can act as an irritating factor causing periodontal disease (12).

Poor life style is a significant factor in high prevalence of periodontal disease. Industrial workers constitute a high risk population due to their poor life style and oral diseases are seen more commonly among them. Lower socioeconomic status was observed to be an important factor in Japanese workers for high prevalence of periodontal disease and poor oral hygiene practices (13-15). A previous study from Finland also showed that periodontal disease increased with poor standard of oral hygiene and unhealthy lifestyles (15).

The current study population is production line workers in brass industries and belongs to lower socioeconomic status. It was interesting to observe in the present study that significantly greater number of workers reported of using toothbrush to clean their teeth than the general population; however this habit failed to show its effect on periodontal status of industrial workers.

Conclusions

Periodontal status of brass industry workers was found to be poor than the general population. Tooth cleaning frequency did not differ significantly between the industrial workers and general population.

References

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