



Assessment of Dental caries status, Periodontal health and oral hygiene practices among two Populations of Moradabad city, India

Abstract:

Background: Ever since the beginning of the universe mankind had struggled constantly for their livelihood, Moradabad is branded as the “Brass city” of India, which comprises of a large number of populations working in different industries. **Objective:** To assess and compare the oral health status of workers employed in brass industries with non industrial workers of Moradabad city. **Methods:** A total of 500 workers from each group aged 30-50 with 5 years working experience were selected through random sampling. Type III examination was performed by recording who oral health assessment form. To compare the proportion chi-square test was used. Mean values were compared using students t-test. SPSS version 15.0 was used for statistical analyses. **Results:** The prevalence of dental caries as Mean DMFT score was significantly higher in Non Industrial Group i.e. 3.57 ± 2.74 while it was 2.88 ± 2.14 in brass workers. Periodontal diseases were higher among production workers that belong to brass industries. The prevalence of Oral Mucosal Lesions was significantly higher among Production Workers. Bleeding was more pronounced in general population but calculus and pockets were seen more in brass workers. The requirement of prosthetic status was also more prevalent among industry subjects. **Conclusion:** The Oral health status of Brass Industry Workers was relatively poor with poor periodontal health when compared to General Population. Further studies of oral occupational disease should be conducted in order to check or confirm previous reports and to discover possible manifestations arising in new industries.

Key Words: Moradabad; Oral Health Status; Occupational Health; Dental Caries; CPI; Workers.

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DOI: <http://dx.doi.org/10.3126/ijosh.v3i2.6312>

Introduction

Health at work and healthy work environment are amongst the most valuable assets of individuals, communities and countries. 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. It is only recently that there has been a shift in approach to the problems of occupational health and safety. Instead of investigating accidents after they have occurred, taking a high toll of human life, it is now felt that preventing the occurrence of industrial disasters and occupational diseases is a much better idea. 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 [1]. 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.

In day to day life people work and struggle for their livelihood.

The maximum hour's people work outside their house that constitutes the environment for them. It may help or deteriorate the health of an individual. Thus occupational health is quite significant. Glass industry is one among them where thousands of workers are indulged for earning a quality of life. Many studies have shown that there is a high prevalence of dental caries in industrial workers [2,3]. Environmental hazards contribute to poor oral health in many occupations [4,5].

Methods

The study done was a comparative survey in which the oral health status of brass factory employees were compared with non industrial workers i.e. the general population residing in Moradabad. A pilot study was conducted on 20 brass industry and non industrial workers to find out the feasibility of the study. Oral health status was assessed among them using WHO Oral Health Assessment Form 1997[6]. Based on the findings with standard error of 1%, sample size was estimated as 500 in each group. Standardization was carried out to minimize the intra examination error. The investigator was trained and calibrated

for recording the WHO oral health Performa for oral diseases. The periodontal examination was done according to CPI criteria. sixteen brass industries were enlisted by visiting each factory and 8 were picked up by simple random sampling lottery method. Non industrial workers were included from dental camps organized for general population in Moradabad district. A pre-designed questionnaire was used to collect demographic information. Ethical clearance was obtained from ethical committee of Kothiwal Dental College and Research Centre, Moradabad. Informed consent was also obtained from each worker before conducting clinical examination.

Statistical Analysis: Statistical tests were performed using Statistical Package for Social Sciences, version 15.0. To compare the proportion chi-square test was used. Mean values were compared using students-t test. CI of the study was kept at 95% hence the p value less than 0.05% denoted statistically significant.

Results

Among the non-industry workers 72.4% belong to 30-40 years and 27% belong to 41-50 years. Whereas in brass workers 80% comprises of 30-40 years and nearly 20% forms 41-50 years age group. The difference among the age group and type of industry is found to be significant. Table I Mean number. of decayed teeth in non-brass group (2.54±2.00) was significantly higher as compared to brass group (1.86±1.78). The mean number of

Table I Distribution of Study Population According To Type of Industry and Age Group

Age Group	Type of Industry		Total
	Non Brass	Brass	
Mean Age	38.28±4.22	37.30±4.20	37.79±4.24
30-40	362(72.4%)	400(80%)	762(76.2%)
41-50	138(27.6%)	100(20%)	238(23.8%)

χ²=7.962 (df=1); p=0.005

missing and filled teeth in non-industrial group was 0.75±1.920 and 0.28±0.70 whereas in brass group it was 0.77±1.31 and 0.25±0.75. Total Mean DMFT was 3.57±2.74 in non-brass and 2.88±2.14 in brass group which was significantly higher in non-industrial group as compared to brass group (p<0.001), table II.

Table II Mean DMFT Status in relation to type of industry

Variable	Type of Industry		“t”	“p”
	Non-Brass	Brass		
Decayed	2.54±2.00	1.86±1.78	5.717	<0.001
Missing	0.75±1.92	0.77±1.31	0.192	0.848
Filled	0.28±0.70	0.25±0.74	0.661	0.509
DMFT	3.57±2.74	2.88±2.14	4.467	<0.001

Among brass workers bleeding was highest with 49% of subjects among 30-40 years. The non-brass workers showed more bleeding as compared to brass workers. Pockets up to 5 mm were more in industry workers as calculus is prevalent among them shown in table III.

Table III Distribution of Study Population According to Type of Industry, Age and CPI

CPI Score	Brass Worker		Non Brass Worker	
	30 - 40	41- 50	30 - 40	41- 50
Healthy	29(7.25%)	4(4%)	20(5.52%)	8(5.79%)
Bleeding	196(49%)	36(36%)	201(55.52%)	60(43.47%)
Calculus	135(33.75%)	46(46%)	127(35.08%)	56(40.57%)
Pocket up to 5 mm	38(9.5%)	13(13%)	14(3.86%)	14(10.14%)
Pocket > 6mm	2(0.5%)	1(1%)	0(0%)	0
Excluded	0(0%)	0(0%)	0(0%)	0

Adverse oral habits in both the groups were shown in table IV. There were 221 (44.2%) subjects in non-brass industry and 269 (53.8%) in brass industry group who had adverse oral habits like pan masala, gutkha etc. In association with CPI, it was seen that subjects with no adverse habits had significantly higher healthy periodontal status as compared to those with adverse oral habits (p<0.001). Statistically the incidence of adverse oral habits was significantly higher amongst brass industry subjects. Majority of respondents in both groups used to clean their teeth once a day. Only 20 (4.0%) subjects in non-brass group and 33 (6.6%) subjects in brass group used to clean their teeth twice a day shown in table V. Frequency of cleaning teeth after every meal was very low in both the groups. In majority of cases the prosthetic status was intact table VI. However, in brass industry subjects the proportion of patients who had received prosthetic rehabilitation (n=186; 37.2%) was significantly higher as compared to non-brass (n=115; 23%) group (p<0.001). Prosthetic need was more in industrial workers as compared to general population. Need for one-unit of prosthesis was seen in 3 (0.6%) non-brass and 27 (5.4%) brass workers. Multi-unit prosthesis was also more among industrial workers i.e.122 (24.4%). (16.5%) of brass industry workers were seeking a Combination of one- and/or multi-unit prosthesis which was more in comparison to non industrial group. Table VII showed that requirement of prosthesis was more pronounced in brass industry subjects. Overall there was a significant difference in prosthetic need of two groups (p<0.001).

Table IV Distribution of Study Population According Adverse Oral Habits (Smoking, Tobacco Chewing, Pan, Ghutka)

Habits	Type of Industry				Total n=1000	
	Non-Brass (n=500)		Brass (n=500)			
No	279	55.8%	231	46.2%	510	51%
Yes	221	44.2%	269	53.8%	490	49%

χ²=9.220 (df=1); p=0.002

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 [7]. The present study was a cross sectional study to assess the oral health status of brass industry workers, and general population of Moradabad city. A total of 500 brass factory employees were examined and compared with general population of same age group. In our study the mean DMFT score was significantly higher in non industrial group 3.57 ± 2.74 as compared to brass industry group 2.88 ± 2.14 .

Table V Distribution of Study Population According to Type of Industry and Frequency of Cleaning Teeth

Method of cleaning	Type Of Industry				Total n=1000	
	Non-Brass (n=500)		Brass (n=500)			
Once	478	95.6%	465	93.0%	943	94.3%
Twice	20	4.0%	33	6.6%	53	5.3%
After every meal	2	0.4%	2	0.4%	4	0.4%

$\chi^2=3.368$ (df=2); p=0.186

This could be possibly due to the higher frequency of sweet consumption, sticky food and poor oral hygiene practices among general population. The results were positively associated with the previous study conducted among Lebanese adults showed that the poor dietary habits including high consumption of sugar containing products were associated with dental caries [8]. In our study both factory employees and general population showed an increase in CPI scores and was observed with an increase in age, which was statistically significant. Higher proportion of patients with bleeding gums was seen in lower age group, whereas calculus and deeper periodontal pockets were more common in higher age groups for all the sextants.

Table VI Distribution of Study Population According To Type of Industry and Prosthetic Status

Prosthetic Status	Type of Industry				Total	
	Non-Brass		Brass			
Intact	385	77.0	314	62.8	699	69.9
Rehabilitated	115	23.0	186	37.2	301	30.1

$\chi^2=23.959$ (df=1); p<0.001

Healthy scores were found in younger age groups, more bleeding was dominating among 30-40 years, and calculus was maximum in 41- 50 years. These findings were in conformity with

a previous study on Finnish Industrial population showing the progression of periodontal disease with advancing age [9]. The study done on South Australian employees also showed that regression of periodontal status as age advances [10]. The results of our study were in correlation with the studies done on factory workers in Shanghai, China [11] and Araraquara, in Brazil [12], Davangere city; Karnataka that calculus was the commonest score among industrial workers [13].

Poor life style is a significant factor in high prevalence of periodontal disease. Industrial workers constitute a well-defined

Table VII Distribution of Study Population According To Type of Industry and Prosthetic Need

Prosthetic Need	Type Of Industry				Total	
	Non-Brass		Brass			
No prosthesis needed	383	76.6%	315	63.0%	698	69.8%
Need for one-unit prosthesis	3	0.6%	27	5.4%	30	3.0%
Need for two-unit prosthesis	0	0%	3	0.6%	3	0.3%
Need for multi-unit prosthesis	90	18.0%	122	24.4%	212	21.2%
Need for a combination of one - and/or multi-unit prosthesis	24	4.8%	33	16.5%	57	5.7%

$\chi^2=23.959$ (df=1); p<0.001

A statistically significant difference was observed in the prosthetic status between the brass factory employees and the general population. In majority of cases (n=385 in non-brass industry and n=314 in brass industry), the prosthetic status was intact. However, in brass industry subjects the proportion of patients who had received prosthetic rehabilitation (n=186; 37.2%) was significantly higher as compared to non-brass (n=115; 23%) group (p<0.001) table 6. This might be due to higher percentage of factory employees that visited the dentist for replacement of teeth due to their access to dental check-up in their factories by dentists at regular intervals [18]. Requirement of prosthesis was more pronounced in brass industry subjects as compared to non-brass industry subjects showed in table 7. Overall there was a significant difference in prosthetic need of two groups (p<0.001).

Conclusion

Oral health is considered not only the mirror of overall health of an individual but also a significant component of general health, hence oral health promotion needs to be integrated with the occupational service to improve oral health in industrial populations[19]. In conclusion good health practices were related to periodontal health. Subjects reporting poor health practices and unhealthy life style should be advised to change their habits to decrease their risk of developing periodontal disease. Further studies of oral occupational disease should be

conducted in order to check or confirm previous reports and to discover possible manifestations arising in new industries [20].

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