

Oral Health Status and Treatment Needs of Jeep Battery Manufacturing Workers at Metagalli, Mysore, Karnataka

Jyothi C¹, Anjan Giriraju²

ABSTRACT

Introduction: Dental health is as important as general health, but the irony is; it has not received the same amount of importance as that of the general health. This fact is even more prevalent in the labourers, who are bound to neglect their oral health because of busy scheduled and stressful life. Some occupational exposures are associated with oral changes in both hard and soft tissues. Study aimed to assess oral health status and treatment needs of jeep battery manufacturing workers at Metagalli, Mysore, Karnataka.

Material and methods: A cross-sectional survey was carried out among 175 Jeep battery manufacturing factory workers in Metagalli, Mysore, Karnataka. Information regarding demographic details and oral habits was collected using specially designed questionnaire. Data on oral health status and treatment needs was collected DMFT Index and CPITN index by conducting intra-oral examination.

Results: Among factory workers, 25.71% had the habit of smoking, 0.57% had habit of beetle nut chewing and 3.43% had the habit of ghutka chewing. The total average DMFT score among all workers was 1.71. About 46.28% of workers required scaling procedure and 1.71% of workers required periodontal surgery.

Conclusion: Majority of the participants in the survey had habit of tobacco chewing and smoking. Participants had problem of dental caries, gingivitis and periodontitis requiring necessary treatment

Keywords: Jeep Battery Factory, Oral Health Status, Treatment Needs, Oral Habits

INTRODUCTION

The environment is one among the many determinants of the human health. The key to man's health lies largely in his environment, and the survey of the disease is indeed the survey of man and his environment.¹ "Occupational environment" means the sum of external conditions and influences, which prevail at the place of work and which have a bearing on the health of working population.¹ The interaction of the individual with the physical, chemical and biological agents of the work place has great bearing on his physical and the psychological health. Exposure to chemical, physical, and biological agents in the workplace can result in adverse effects on workers ranging from simple discomfort and irritation to debilitating occupational diseases such as lung fibrosis, neuropathy, deafness, organ damage, oral diseases and cancers of various sites including oral cavity.²

Dental health is as important as general health, but the irony is; it has not received the same amount of importance as that of the general health. This fact is even more prevalent in the labourers, who are bound to neglect their oral health because of busy scheduled and stressful life.³ Majority of people employed

in various industries are exposed to perilous environment. Few studies have shown the association between occupational exposure and greater incidence of oral diseases.⁴⁻⁷

On review of literature, there was very less information available on the effects of occupational hazards on oral health status of individuals in developing countries. Therefore, a survey was undertaken with aim to assess oral health status and treatment needs of jeep battery manufacturing workers at Metagalli, Mysore, Karnataka.

MATERIAL AND METHODS

A cross-sectional, descriptive survey was conducted to assess the oral health status and treatment needs of the jeep battery manufacturing factory workers in Metagalli, Mysore, Karnataka from November 2014 to February 2015. All the required and relevant information regarding Jeep battery manufacturing workers was collected using specially designed questionnaire and also using the employment records of the workers after obtaining permissions from the management of the factory. The total population of jeep battery manufacturing factory workers was 175. Whole sample was included in the survey. All the jeep battery manufacturing factory workers were males.

Prior permission was taken from the Management of Gillette Jeep Battery manufacturing factory, Metagalli, Mysore to conduct the oral examination of jeep battery manufacturing factory workers. Before starting the survey, the ethical clearance was obtained from the Institutional Ethical Committee of JSS Dental College, Hospital and Research Centre, Mysore. The subjects participating in the survey were duly informed about the purpose of the survey and consent was taken from them before their participation in the survey in order to prevent any in-convenience and to ensure full cooperation during survey.

Inclusion criteria

Battery factory workers of all ages, available at the time of examination were included in the survey.

Exclusion criteria

Subjects who were not willing to participate in the survey

¹Professor and Head, Department of Public Health Dentistry, Vivekananda Dental College for women, Salem, Tiruchengode, Tamil Nadu, ²Reader, Department of Public Health Dentistry, Rajarajeswari Dental College and Hospital, Bangalore, India

Corresponding author: Dr. Anjan Giriraju, Reader, Room No.8, Department of Public Health Dentistry, Rajarajeswari Dental College and Hospital, Ramohalli Cross, Mysore Road, Bangalore-560074, India

How to cite this article: Jyothi C, Anjan Giriraju. Oral health status and treatment needs of jeep battery manufacturing workers at Metagalli, Mysore, Karnataka. International Journal of Contemporary Medical Research 2017;4(5):1017-1020.

Training and calibration

The examiner and recording assistant (pursuing internship training) was trained and calibrated in the Department of Public Health Dentistry, under the supervision of the staff members to prevent any diagnostic variability among the survey subjects during the oral examinations.

Data collection

A detailed schedule of the survey was prepared well in advance. Care was taken not to disturb the workers during their working period, so the survey was planned to be conducted during free time period of the factory workers. The investigator visited the survey area during the prescheduled time frame in the survey period. Sufficient numbers of sterile instruments were made available for the examination during the survey. The following instruments and materials were used for the survey: Plane mouth mirrors, disposable gloves, explorers, tweezers, kidney trays, CPITN probe, containers (one for used instruments and the other for sterilized instruments), Betadine™, saline, gauze, cotton with cotton holder, mouth masks and data recording proforma. Information regarding demographic details (name, age, sex, location and deleterious oral habits) and oral symptoms recorded. The oral health status was assessed using the DMFT (Decayed Missing Filled Tooth) index⁸, CPITN (Community Periodontal Index and Treatment Needs) index.⁹ Clinical examination was done solely by the investigator with the survey subjects seated on an ordinary chair using natural daylight. All the data was recorded by a recording assistant specially trained for the purpose. During the examination, the recording assistant was made to sit closely so that instructions and codes could be easily heard and repeated for confirmation. The interview and examination of a single subject took on average about 15 to 20

min. Those workers who needed immediate care for pain or infection were referred for further treatment.

STATISTICAL ANALYSIS

The raw data obtained was tabulated using the Microsoft Excel spreadsheet software (Microsoft office 2010). The data was analysed using Statistical Package for Social Sciences (SPSS Inc., Chicago, IL, USA) version 17.0. Data was represented in the form of tables.

RESULTS

The study was conducted on 175 jeep battery manufacturing workers, Gillette Jeep Battery factory in Metagalli, Mysore. The mean age of battery workers was 39.5 years. Among factory workers, 25.71% had the habit of smoking, 0.57% had habit of beetle nut chewing and 3.43% had the habit of ghutka chewing [Table 1]

Table 2 shows DMFT score of the workers according to age group. The total average DMFT score among all workers was 1.71. Table 3 shows periodontal status of the workers according to age group. The percentage of workers suffering from gingivitis was 37.14% and Periodontitis with shallow pocket [4-5 mm] and deep pocket [6mm and more] depths were 9.14% and 1.71% respectively. Table 4 shows periodontal treatment needs of the workers. All the workers were suffering from various stages of periodontal disease. About 46.28% of workers required scaling procedure and 1.71% of workers required periodontal surgery.

DISCUSSION

Various factors such as environmental factors, occupational factors, dietary factors, pathologic factors and oral hygiene practices affect the oral health of an individual. Lack of medical

Age (in years)	Number of workers	Smokers		Non- Smokers		Betel nut		Ghutka	
		No.	%	No.	%	No.	%	No.	%
19-24	53	4	7.5	43	81.1	0	0	2	3.7
25-34	49	14	28.5	34	69.3	0	0	2	4
35-44	63	23	36.5	41	65	1	1.5	1	1.5
45-54	10	4	40	5	50	0	0	1	10
Total	175	45	25.7	123	70.2	1	0.5	6	3.4

Table-1: Oral habits among Jeep battery manufacturing workers

Age (in years)	Number of workers	D	M	F	DMFT	Average
19-24	53	57	20	1	78	1.47
25-34	49	46	17	16	79	1.61
35-44	63	43	66	13	127	1.93
45-54	10	8	23	0	31	3.1
Total	175	154	126	30	310	1.77

Table-2: DMFT scores of the Jeep battery manufacturing workers according to age group

Age (in yrs)	No. of workers	Score 0 Healthy		Score 1 Bleeding		Score 2 Calculus		Score 3 PPKD 4-5mm		Score 4 Ppkd > = 6mm	
		No.	%	No.	%	No.	%	No.	%	No.	%
19-24	53	38	71.6	3	5.6	12	22.6	0	0	0	0
25-34	49	29	59.1	2	4.0	16	32.6	2	4.0	0	0
35-44	63	22	34.9	2	3.1	26	41.2	12	19.0	1	1.5
45-54	10	2	20	0	0	4	40.0	2	20.0	2	20
Total	175	91	52	7	4.0	58	33.1	16	9.1	3	1.7

PPKD - Periodontal pocket depth

Table-3: Periodontal status of the Jeep battery manufacturing workers according to age group using CPITN index

Age (in yrs)	No. of workers	TN		TN1		TN2		TN3	
		No.	%	No.	%	No.	%	No.	%
19-24	53	38	71.6	3	5.6	12	22.6	0	0
25-34	49	29	59.1	2	4.0	18	36.7	0	0
35-44	63	22	34.9	2	3.1	38	60.3	1	1.5
45-54	10	2	20.0	0	0	6	60.0	2	10.0
Total	175	91	52.0	7	4.0	74	42.2	3	1.71

TN - Treatment Needs

Table-4: Periodontal treatment needs of the Jeep battery manufacturing workers according to age group using CPITN index

health care facilities in the factory premises, especially oral health care facilities, reflects the factory employees' poor health condition.¹⁰

The present survey was carried out to assess oral health status and treatment needs of jeep battery manufacturing workers at Metagalli, Mysore, and Karnataka. The response rate of the survey was 100%. All the participants in the survey were male population. The age of the participants who participated in the survey ranged from 19-54 years. In the following survey all variables were subdivided based on the age group to get a definite relationship of the oral health status based on age group. In the survey, deleterious oral habits like smoking, pan chewing and ghutka chewing was assessed as these oral habits have proven to have direct relationship with oral health status from many globally conducted studies. The probable reason for such oral habits among the workers may be due to stress and strain associated with their work environment. In the present study about 25.71% had the habit of smoking, 0.57% had habit of beetle nut chewing and 3.43% had the habit of ghutka chewing. Similar results were seen in studies conducted by Akman et al.¹¹, Saraswathi et al.¹², and Townsend et al.¹³

In the present survey, DMFT index was used to measure dental caries experience of the factory workers. It was found that total average DMFT score among all workers was 1.71. Similar results were seen in studies conducted by Khurana et al.¹⁴, Malcolm and Paul¹⁵, Ten Bruggen Cate¹⁶, Bachanek et al.¹⁷, Ahlberg et al.¹⁸ and Tuominen et al.¹⁹ Dental decay increased with the increase in age in our study and was same as reported by Duraiswamy et al.²⁰ The mean DMFT in our study also increased with the increase in the age which was same as reported by Petersen.²¹ Amongst the younger workers in our study more number of mean teeth showed no need for treatment, which was contrary to that reported by Tomita et al.²² Mean number of missing teeth due to caries were maximum in older age group which was same as reported by Tanase.²³ Percentage of subjects, which were caries free was very high than reported by Duraiswamy et al.²⁰ Missing teeth was the dominant expression of caries experienced in the older age-groups and it was same in both studies. The prevalence of high dental caries experience could be due to the lack of dental care facilities.

In the survey, periodontal status and treatment need was assessed using CPITN index. It was found that all the workers were suffering from various stages of periodontal disease. About 46.28% of workers required scaling procedure and 1.71% of workers required periodontal surgery. Regarding the periodontal status of the subjects, higher percentages of subjects in our study were free from any signs of periodontal disease than that reported by Srikandi and Clarke.²⁴ Teeth with probing depths greater than 4 mm increased with the increase

in age in this study and it was same as that reported by Lie et al.²⁵ and Kumar S et al.²⁶ The most prevalent treatment need in the present study was oral prophylaxis which was same as reported by Roman and Pop.²⁷ There was an increase in the periodontal pocket and attachment loss prevalence, and it was positively associated with age of the acid factory workers.^{28,29} The toxic substance in the plaque becomes a source of gingival irritation, which penetrates the gingival epithelium, causing inflammation of the gingival vasculature and its periphery.³⁰ Removal of plaque should be the most important objective for the prevention, control and treatment of periodontal disease.³¹

CONCLUSION

Majority of the participants in the survey had habit of tobacco chewing and smoking. Participants had problem of dental caries, gingivitis and periodontitis requiring necessary treatment. Oral health status of the participants was found to be average. There is need to educate the subjects regarding oral habits deleterious effect, regarding importance of oral hygiene, regular visit to the dentist for dental education and necessary dental treatment.

REFERENCES

1. Park K. Environment and health. In: Park's Textbook of Preventive and Social Medicine. Jabalpur: M/s Banarsidas Bhanot Publishers (India); 2007. p. 566-58.
2. Verma DK, Purdham JT, Roels HA. Translating evidence about occupational conditions into strategies for prevention. *Occup Environ Med.* 2002;59:205-13.
3. Tarulatha RS, Nidhi R. Occupational dental health hazards: A review. *International Journal of Contemporary Dental and Medical Reviews.* 2015.
4. Schour I, Sarnat BG. Oral manifestations of occupational origin. *J Am Med Assoc.* 120:1197-207.
5. Shizukuishi S, Hayashi N, Tamagawa H, Hanioka T, Maruyama S, Takeshita T et al. Life style and periodontal health status of Japanese Factory workers. *Ann Periodontol.* 1998;3:303-11.
6. Sanadhya S, Ramesh N, Sharda A, Asawa K, Tak M, Batra M et al. The Oral Health Sta-tus and the Treatment Needs of Salt Workers at Sambhar Lake, Jaipur, India. *J Clin Diagn Res.* 2013;7:1782-6.
7. Ramesh N, Sudhanshu S, Sharda A, Asawa K, Tak M, Batra M et al. Assessment of the Periodontal Status among Kota Stone Workers in Jhalawar, India. *J Clin Diagn Res.* 2013;7:1498-1503.
8. Klein H, Palmar CE. Sex difference in Dental caries experience of elementary school children. *Public Health Reports.* 53:1685-1734.
9. Cutress TW, Ainamo J, Sardo-Infirri J. The community periodontal index of treatment needs (CPITN) procedure for population groups and individuals. *Int Dent J.* 1987; 37:222-33.

10. Sharma A et al. Oral health status of cement factory workers, Sirohi, Rajasthan, India. *Journal of Health Research and Reviews*. 2014;1:15-19.
11. Akman H, Akal KU, Redzep E, Delilbasi C. Prevalence of oral lesions in a selected Turkish population. *Turk J Med Sci*. 2003;33:39-42.
12. Saraswathi TR, Ranganathan K, Shanmugam S, Sowmya R, Narasimhan PD, Gunaseelan R. Prevalence of oral lesions in relation to habits: Cross-sectional study in South India. *Indian J Dent Res*. 2006;17:121-5.
13. Townsend J, Roderick P, Cooper J. Cigarette smoking by socioeconomic group, sex, and age: effects of price, income, and health publicity. *BMJ*. 1994;309:923-7.
14. Khurana S et al. Oral health status of battery factory workers in Kanpur city: A cross-sectional study. *JIAPHD*. 2014;12:8-87.
15. Malcolm D, Paul E. Erosion of the teeth due to sulphuric acid in the battery industry. *Br J Ind Med*. 1961;18:63-9.
16. Ten Bruggen Cate HJ. Dental erosion in industry. *Br J Ind Med*. 1968;25:249-66.
17. Bachanek T, Pawłowicz A, Tarczydło B, Chalas R. Evaluation of dental health in mill workers. Part I. The state of dentition. *Ann Agric Environ Med*. 2001;8:103-5.
18. Ahlberg J, Tuominen R, Murtomaa H. Subsidized dental care improves caries status in male industrial workers. *Community Dent Oral Epidemiol*. 1996;24:249-52.
19. Tuominen M, Tuominen R, Ranta K, Ranta H. Association between acid fumes in the work environment and dental erosion. *Scand J Work Environ Health*. 1989;15:335-8.
20. Duraiswamy P, Kumar TS, Dagli RJ, Chandrakant, Kulkarni S. Dental caries experience and treatment needs of green marble mine laborers in Udaipur district, Rajasthan, India. *Indian J Dent Res*. 2008;19:331-4.
21. Petersen PE. Dental visits, dental health status and need for dental treatment in a Danish industrial population. *Scand J Soc Med*. 1983;11:59-64.
22. Tomita NE, Chinellato LE, Lauris JR, Kussano CM, Mendes HJ, Cardoso MT. Oral health of building construction workers: An epidemiological approach. *J Appl Oral Sci*. 2005;13:24-7.
23. Tanase M, Petersen PE. Oral health status of an industrial population in Romania. *Int Dent J*. 1997;47:194-8.
24. Srikanthi TW, Clarke NG. Periodontal status in a South Australian industrial population. *Community Dent Oral Epidemiol*. 1982;10:272-5.
25. Lie T, Due NA, Abrahamsen B, Bøe OE. Periodontal health in a group of industrial employees. *Community Dent Oral Epidemiol*. 1988;16:42-6.
26. Kumar TS, Duraiswamy P, Dagli RJ, Chandrakant, Kulkarni S. Dental caries experience and treatment needs of green marble mine labourers in Udaipur district, Rajasthan, India. *Indian J Dent Res*. 2008;19:331-4.
27. Roman A, Pop A. Community periodontal index and treatment needs values (CPITN) in a factory worker group in Cluj-Napoca, Romania. *Int Dent J*. 1998;48:123-5.
28. Tuominen M. Occurrence of periodontal pockets and oral soft tissue lesions in relation to sulphuric acid fumes in the working environment. *Acta Odontol Scand*. 1991;49:261-6.
29. Hohlfeld M, Bernimoulin JP. Application of the community periodontal index of treatment needs (CPITN) in a group of 45-54-year-old German factory workers. *J Clin Periodontol*. 1993;20:551-6.
30. Tomita NE, Chinellato LE, Lauris JR, Kussano CM, Mendes HJ, Cardoso MT. Oral health of building construction workers: An epidemiological approach. *J Appl Oral Sci*. 2005;13:24-7.
31. Imaki M, Yoshida Y, Tanada S. Relation between smoking and periodontal disease by oral hygiene status in Japanese factory workers. *Appl Human Sci*. 1997;16:77-81.

Source of Support: Nil; **Conflict of Interest:** None

Submitted: 17-03-2017; **Accepted:** 16-05-2017; **Published:** 28-05-2017