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Assessment of oral health status and tooth wear among glass factory workers in Bangalore

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Abstract

Introduction: Occupational hazard can be defined as 'an unpleasant health risk to a person usually arising out of employment'. Dental erosion is an irreversible pathological condition characterized by loss of hard dental tissue due to chemical produced by acids without bacterial involvement. Its incidence and prevalence is increasing. The major etiologic factor for dental erosion is the exposure to environmental pollutants like silica, acids, and pharmaceuticals etc. which over a period of time cause considerable tooth substance loss.

Aim: To assess the oral health status and tooth wear among glass factory workers in Bangalore.

Materials and Methods: A descriptive cross-sectional survey was conducted to assess the oral health status and tooth wear of glass factory workers working at various glass factories in Bangalore. Glass factory workers aged between 18-60 years were included in the study. Oral health status was recorded using World Health Organization (WHO), 'Oral health Assessment Form' (2013) for adults and assessment of tooth wear by using Smith and Knight index 1984 [TWI].

Results: Glass factory workers who brushed twice a day had a good oral hygiene than who brushes once a day ($P<0.05$). Majority of glass factory workers 126 (42%) had Shallow periodontal pockets of 4-5 mm and 185 (61.7%) had 0-3 mm of loss of attachment. The most severe tooth wear 281 (93.7%) was in incisors teeth followed by 212 (70.7%) on occlusal/incisal surfaces.

Conclusion: Results revealed that the oral health status of glass factory workers was found to be poor. Systematic dental service and health education regarding health promoting behaviour is required for this group.

Keywords: Oral health status, Smith and Knight Index, Tooth wear, WHO.

Introduction

Occupational hazard can be defined as unpleasant health risk to a person usually arising out of employment. It refers to work, material, substance, process or situation that predisposes or itself causes accidents or disease at work place [1]. Silica or quartz dust has been observed to cause tooth wear among people who are regularly exposed to its dust or vapour. Example of one such occupation in which environment plays a major role is glass factory work [2]. The World Health Organization (WHO) places occupational risks as one of the leading cause of morbidity and mortality [3].

Tooth wear has been defined as loss of tooth substance resulting from abrasion, attrition and erosion as a sole cause or concurrently i.e. abfractions as defined by Pindborg [4]. Dental erosion is an irreversible pathological condition characterized by loss of hard dental tissue due to chemical produced by acids without bacterial involvement [5]. It was reported first in the 19th century and since then its incidence and prevalence is increasing.

The aetiologic factors can either be extrinsic or intrinsic. One of the major aetiologic factor for dental erosion is the exposure to environmental pollutants like silica, acids and pharmaceuticals which over a period of time cause considerable tooth substance loss [6-8]. Tooth wear is considered pathologic when the loss of tooth surface is excessive to the extent that it affects the appearance or function of the dentition or causes discomfort. An extremely worn dentition is uncommon, but when it occurs, it is considered to be a great esthetic and clinical problem [9]. Hence, this study is an attempt to assess the oral health status and tooth wear among glass factory workers in Bangalore, Karnataka, India.

Materials and Method

A descriptive cross-sectional survey was conducted to assess the oral health status and tooth wear of glass factory workers at various glass factories in Bangalore, Karnataka, India from June 2017 to May 2018. Before the commencement of the study, information regarding the glass factories in Bangalore, Karnataka, India was obtained and it was found that there were many glass factories in the Bangalore city and the required sample size for the present survey was set at 300, by using convenient sampling. All the glass factory workers present at the time of examination and who gave informed consent were included in the survey till the required sample size was met. Ethical clearance was taken from the Institution Review Board. Prior permission was obtained from the authorities of Glass factories.

300 Glass factory workers aged between 18-60 years were included in the study and were interviewed regarding demographic, general and oral health details. Oral health status was recorded using WHO 'Oral Health Assessment Form' for adults 2013 [10] for oral health status and treatment needs and Tooth Wear was assessed by using 'Smith and Knight Index' 1984 [TWI] [11]. Clinical examination was done in glass factory.

Statistical Analysis

Data was analyzed using Microsoft excel 2010 and SPSS version 19 respectively. Statistical significance is assessed at 5% level of significance. Proportions were compared by using Chi- square test. Pearson's co-relation coefficient, ($P<0.05$) was considered as statistically significant. Results on categorical measurements were present in number and percent (%).

Results

A descriptive cross-sectional survey was conducted to assess the oral health status and tooth wear in glass factory workers working at various glass factories in Bangalore, Karnataka, India. Glass factory workers aged between 18-60 years were included in the study and were interviewed regarding demographic, general and oral health details. A total of 300 glass factory workers were assessed for their oral health status and treatment needs using WHO 'Oral Health Assessment Form' for Adults 2013 [10] and Tooth Wear assessment using Smith and Knight index 1984[TWI][11].

Table 1 shows that distribution of socio-demographic characteristics among the glass factory workers. Out of 300 glass factory workers, 264 (88%) were males and 36 (12%) were females. Majority of glass factory workers 129 (43.0%) were in the age group 21-30 years. Among the glass factory workers majority of workers i.e. 153 (51.0%) were with <5 years of work experience.

Table 1: Distribution of Socio demographic Characteristics

Variables	Category	n	%
Age	< 20 years	40	13.3%
	21-30 years	129	43.0%
	31-40 years	71	23.7%
	41-50 years	35	11.7%
	51-60 years	25	8.3%
Sex	Males	264	88.0%
	Females	36	12.0%
Work Experience	< 5 years	153	51.0%
	5-10 years	93	31.0%
	> 10 years	54	18.0%

Table 2 shows that distribution of periodontal status of the glass factory workers. Gingival bleeding was present among 187 (62.3%) of the population. Majority of glass factory worker 126 (42%) had Shallow periodontal pockets of 4-5 mm. Among total population more than half of the study population (majority) that is 185 (61.7%) had 0-3 mm loss of attachment.

Table 2: Distribution of Periodontal Status

Variable	Categories	n	%
Gingival Bleeding	Absent	113	37.7%
	Present	187	62.3%
Periodontal Pocket	Absent	121	40.3%
	Shallow Pocket (4-5mm)	126	42.0%
	Deep Pocket (>6mm)	53	17.7%
Loss of Attachment	0 - 3 mm	185	61.7%
	4 - 5 mm	98	32.7%
	6 - 8 mm	17	5.7%

Table 3 shows oral hygiene practices among glass factory workers. Nearly 267 (89%) used tooth brush as a cleaning aid. Among those who used tooth brush as cleaning aid majority i.e. 63 (23.6%) used soft tooth brush bristles, 134 (50.2%) workers were not aware about the type of tooth brush bristles they used. Majority of glass factory workers 73.4% (196) brushed their teeth once a day, only 31.1% (83) followed brushing method and 72.7% (194) of the workers reported followed haphazard brushing technique.

Table 3: Oral Hygiene Practices among Study Participants

Variables	Category	n	%
Cleaning Aid	Tooth Brush	267	89.0%
	Finger	33	11.0%
Tooth Brush Bristle	Hard	30	11.2%
	Medium	40	15.0%
	Soft	63	23.6%
	Don't Know	134	50.2%
Frequency of Tooth Brushing	Once	196	73.4%
	Twice	69	25.8%
	Occasionally	2	0.7%
Brushing Method	Yes	83	31.1%
	No	184	68.9%
Brushing Technique	Horizontal	63	23.6%
	Vertical	7	2.6%
	Circular	3	1.1%
	Haphazard	194	72.7%

Table 4, shows that distribution of severity and prevalence of lesion according to teeth affected based on smith & knight index, 1984. Severity of tooth wear ranged from 0 to 4. Among the glass factory workers, majority 209 (69.7%) had Grade 1 severity in incisors followed by 115 (38.3%) Grade 2 severity in molars. Prevalence of tooth wear was found highest in incisors teeth. i.e. 281 (93.7%)

Table 4: Distribution of Severity and Prevalence of Lesions According to Teeth Affected [Based on Smith and Knight Index 1984]

	Incisors		Canines		Premolars		Molars	
Severity	n	%	n	%	n	%	n	%
Severity 0	19	6.30%	165	55.0%	88	29.3%	49	16.3%
Severity 1	209	69.70%	88	29.3%	107	35.7%	110	36.7%
Severity 2	49	16.30%	32	10.7%	95	31.7%	115	38.3%
Severity 3	23	7.70%	15	5.00%	10	3.3%	26	8.7%
Severity 4	0	0.00%	0	0.00%	0	0.0%	0	0.0%
Prevalence								
Yes	281	93.7%	135	45.0%	12	70.7%	251	83.7%

No	19	6.30%	165	55.0%	88	29.3%	49	16.3%

Table 5, shows that distribution of severity and prevalence of lesion according to the affected tooth surface based on Smith & Knight index, 1984. Majority of study participants, 186 (62.0%) had Grade 1 severity in occlusal/ incisal surface. Prevalence of tooth wear was found highest i.e. 284 (94.7%) on occlusal/incisal surface.

Table 5: Distribution of Severity and Prevalence of Lesions According to the Affected Tooth Surface [Based on Smith and Knight Index1984]

Severity	Buccal		Occlusal / Incisal		Lingual	
	n	%	n	%	n	%
Severity 0	88	29.3%	16	5.3%	78	26.0%
Severity 1	105	35.0%	186	62.0%	123	41.0%
Severity 2	78	26.0%	78	26.0%	70	23.3%
Severity 3	18	6.0%	20	6.7%	27	9.0%
Severity 4	11	3.7%	0	0.0%	2	0.7%
Prevalence						
Yes	212	70.7%	284	94.7%	222	74.0%
No	88	29.3%	16	5.3%	78	26.0%

Discussion

Tooth Wear (TW) is frequently encountered in dental practice, affecting people of all ages and describes the condition of dental hard tissue. The aetiology of TW is multi-factorial. Various factors such as environmental factors, occupational factors, dietary factors, pathologic factors and oral hygiene practices affect the oral health of an individual. The severity of the health hazards increases with the duration of exposure. The present survey was conducted to assess the oral health status and tooth wear in glass factory workers in Bangalore, Karnataka, India by using WHO 'Oral Health Assessment Form' for Adults 2013 and the Smith and Knight Index was used for the assessment of the prevalence of tooth wear. 300 glass factory workers in the age group of 18-60 years were assessed at various glass factories in Bangalore.

Out of the 300 glass factory workers, majority of them were in the age group 21-30 years (n=129, 43.0%), followed by age group 31-40 years (n=71, 23.7%). Females in the survey were having low representation i.e. 36 (12%) than male 264 (88%) which is similar to the study conducted by Pulkit Chaturvedi et al [2]. In distribution according to work experience, majority of them had a work experience of <5 years (n=153, 51%), followed by least work experience in the age group >10 years (n=54, 18%) which is similar to the study conducted by Petersen et al [12], and Kelada F et al [13].

When the CPI scores was compared majority of the study participants had gingival bleeding i.e. 187 (62.3%). The reason could be that the study population in the present study maintained poor oral hygiene and had irregular work shifts that could have contributed to the same. These results were similar with the study conducted by Ahuja and Darekar et al [14]. On comparing the CPI scores, majority of the study participants were seen to have shallow pocket i.e. 126 (42.0%) and majority of them had loss of attachment of 0-3 mm (n=185, 61.7%). These results were similar to those found in the study conducted by Kundu et al [15] and Almeida et al [16]. Acid exposure may affect the immunologic defenses or protective

components of the saliva which plays an important role in the pathogenesis of periodontal diseases. It may also cause changes in the intra- and extra-cellular pH which plays an important role in the control of cell growth and differentiation and thus leads to periodontitis.

In the present study majority of glass factory workers were using tooth brush (n=267, 89%) as cleaning aid with soft bristles (n=63, 23.6%). 196 (73.4%) of study participants brushed their teeth at least once a day which is similar to study conducted by Said et al [17] and David et al [18]. 184 (68.9%) of study participants did not follow any particular brushing method.. The prevalence of severity of lesions in different types of teeth was most common in incisors (n=212, 93.7%) and least in canine (n=135, 45.0%). The results were in contrast with the study conducted by S.H de carvalho sale – peres et al [19]. The prevalence of severity of lesions in different tooth surface examined had found occlusal/incisal (n=284, 94.7%) was most affected and buccal (n=212, 70.7%) was found least affected, while a study by Hugoson et al [20] showed lesser prevalence.

Conclusion

Dental service may improve the oral health of the Glass factory worker. Special oral health programs focusing on improving access to and use of preventive dental services should also be conducted. The findings of the present study revealed poor oral health status of glass factory worker in Bangalore, Karnataka, India indicating the importance of maintaining good oral health among glass factory workers should be a high priority.

References

1. Park K. Park's textbook of Preventive and Social medicine. 22nd Ed. New Delhi: Banarsidas Bhanot Publishers; 2012.
2. Chaturvedi P, Bhat N, Asawa K, Tak M, Bapat S, Gupta VV. Assessment of Tooth Wear Among Glass Factory Workers: WHO 2013 Oral Health Survey. J Clin Diagn Res. 2015 Aug; 9(8):ZC63-6.
3. Prpic Mehicic, Goranka & Buntak-Kobler, D & Jukić, S & Katunarić, M. (1998). Occupational tooth-wear in clothing industry workers. Collegium antropologicum. 22 Suppl. 241-9.
4. Yêska Paola Costa Aguiar, Fábio Gomes dos Santos, Eline Freitas de Farias Moura, Fernanda Clotilde Mariz da Costa, Sheyla Marcia Auad, Saul Martins de Paiva, Alessandro Leite Cavalcanti, "Association between Dental Erosion and Diet in Brazilian Adolescents Aged from 15 to 19: A Population-Based Study.The Scientific World Journal. vol. 2014, Article ID 818167, 7 pages, 2014.
5. Shafer WG, Hine Levy BM. A textbook of oral pathology. 4th ed. Philadelphia: WB Saunders 1983.
6. Chikte UME, Josie-Perez AM, Cohen TL. A rapid epidemiological assessment of dental erosion to assist in settling an industrial dispute. J Dent Assoc S Afr. 1998; 53:7-12.
7. Marya CM. A textbook of Public Health Dentistry. 1st ed. New Delhi: Jaypee Brothers Medical Publishers Limited 2011.
8. Kin HD, Hong YC, Koh DH, et al. Occupational exposure to acidic chemicals and occupational dental erosion. J Public Health Dent. 2006; 66(3): 205-08.
9. Tuominen M, Tuominen R. Tooth surface loss among people exposed to cement and stone dust in the work environment in Tanzania. Community Dent Health. 1991 Sep;8(3):233-8.
10. World Health Statistics 2013. Geneva: WHO Publications 2013.
11. Smith BG, Knight JK. An index for measuring the wear of teeth. Br Dent J. 1984 Jun 23;156 (12):435-8.

12. Petersen PE, Henmar P. Oral conditions among workers in the Danish granite industry. Scand J Soc Med. 1988; 14: 328-31.
13. Kelada F, Euinton LE. Health effects of long-term exposure to sodium sulfate dust. J Occup Med. 1978; 20(12): 812-14.
14. Ahuja A, Darekar HS. Community dentistry in armed forces. Med J Armed Forces India. 2003; 59:18-20.
15. Kundu H, Basavaraj P, Singla A, Gupta R, Jain S, Singh K. Oral health status among workers of lead acid battery factories in Ghaziabad: A cross-sectional study. J Indian Assoc Public Health Dent. 2017; 15: 127-30.
16. Almeida TF, Vianna MI, Santana VS, Gomes Filho IS. Occupational exposure to acid mists and periodontal attachment loss. Cad Saude Publica. 2008; 24: 495-502.
17. Said Karabekirolu , Nimet unlü. Occlusal and incisal tooth wear in Turkish adult patients. International Journal of Medical and Health. 2017; 3(7): 54-60.
18. David, K. and K. Bhat. “Prevalence Of Tooth Wear In Patients Attending The Department Of Periodontics, Manipal College Of Dental Sciences, Manipal.” National journal of integrated research in medicine. 3 (2012): 136-141.
19. de Carvalho Sales-Peres SH, Goya S, de Araújo JJ, et al. Prevalence of dental wear among 12-year-old Brazilian adolescents using a modification of the tooth wear index. Public Health. 2008 Sep;122(9):942-948.
20. Hugoson A, Bergendal T, Ekfeldt A, Helkimo M. Prevalence and severity of incisal and occlusal wear in an adult Swedish population. Acta Odontol Scand. 1988; 46: 255-65.