STRESS RELATED PERIODONTITIS AMONGST INDUSTRIAL WORKERS

[1]YOUSAF ATHAR

[2]AMNA SAGHEER

[3]BILAL ABDUL QAYUM MIRZA

[4]SITI LAILATUL AKRAM ZAINUDDIN

ABSTRACT

Stress is modulated by factors like work load, routine and lifestyle. Stress has a strong impact on periodontal status and disease activity, a globally accepted phenomenon, but unfortunately not backed up by sufficient epidemiological data, in Pakistan. Present study was conducted to assess the correlation of periodontal disease with stress and factors affecting stress in industrial workers of Lahore. This study included 200 male factory workers employed at metal injection molding factory in Lahore. The presence of stress was assessed using a questionnaire while periodontal health status was assessed using CPITN index. The age of the subjects ranged from 22 to 58 (mean age 38.06 ± 9.87). Workers age ranged 20-29 years had a mean CPITN score of 1.90 ± 0.82 and mean stress of 25.98 ± 10.03. On the other hand workers between 50 and 59 years had mean CPITN 3.44 ± 0.56 and mean stress 46.19 ± 8.33. Working hours, smoking, betel nut use, sleep timings, number of meals, brushing habits along with permanent or contractual jobs had a statistically significant impact on stress. In conclusion the data suggested stress had a direct relationship towards the development of periodontal disease. The contributing factors like smoking, betel nut use, job contract, work hours, meals and sleeping hours increase stress and eventually increase periodontal disease.

Key Words: *Periodontitis, CPITN, Industrial workers, Oral Hygiene, stress.*

INTRODUCTION

Environmental factors have always played an integral role in disease susceptibility and progression.[1] Oral health has a strong impact over general health and plays a vital role towards improving quality of living. Occupational or job stress refers to a psychosocial condition which encompasses the interaction between the worker and his work environment. If left unidentified it causes critical physical and physiological illness potentially affecting both individual and organization. Occupational stress may be individual or organizational or at the interface of the two.[2] Stress is seen to be modulated by factors like work load and routine, especially for industrial workers. Present age industrialization is seen as a yardstick for measuring national growth. For developing countries rapid industrialization along with all its laurels brings an inherent risk to community and workers health.[3] Such countries have experienced a sharp rise in incidence and prevalence of occupational health problems. Ramazzini also dubbed as the father of industrial hygiene was a strong advocate of including patient's occupation in the medical history based on the above mentioned factors.[4]

Lifestyles lay a strong impact on periodontal status and disease activity. Although a widely accepted assumption, but one which is unfortunately not backed up by sufficient epidemiological data, in Pakistan. Epidemiological studies conducted in the United States, however implicate lifestyles as a significant factor leading to periodontal disease.[5]

Recent years have seen periodontitis being identified as a multi-factorial disease.[6] An interplay of causative factors and the clinician's inability to simultaneously control them leads to a predominantly chronic nature and high prevalence of periodontitis amongst world populations. Stress in all its forms has an overwhelming

[1] Yousaf Athar, BDS, MSc, PhD Scholar: Periodontology Department School of Dental Sciences, University Sains Malaysia. (Assistant Professor, Department of Periodontology, Institute of Dentistry, CMH Medical College Lahore)

[2] Amna Sagheer, BDS, MSc, Assistant Professor, Department of Periodontology, Islam Medical and Dental College, Sialkot

[3] Bilal Abdul Qayum Mirza, B.D.S, MPhil. **(Corresponding author)** Associate Professor, Department of Community & Preventive Dentistry, Institute of Dentistry, CMH Lahore Medical College, Lahore. **Address:** 201 Sector E, Street 4, Phase 6, DHA Lahore Email: bilal_abdul_qayum@hotmail.com Cell: +92 300 4770048

[4] Siti Lailatul Akram Zainuddin, BDS, MClin Dent, PhD, Assistant Professor, Periodontology Department, School of Dental Sciences, University Sains Malaysia

bearing on human physiology along with general and oral health maintenance.[7] Stress not only increases the disease susceptibility but also diminishes the patient's ability to counteract the disease through proper health conservation.[8]

Industrial workers although not a true representation of nationwide population but still form a well-defined group in terms of high risk group owing to their strenuous routine neglected oral hygiene and low socioeconomic status. Lahore is the second largest city of Pakistan not only size and population wise but also one of its major industrial hubs. The same workers which form the backbone of these industries also suffer from stressful work conditions and low socioeconomic status and hence unsatisfactory oral hygiene maintenance. No prior study has been conducted to assess the frequency of periodontitis amongst these workers and level of stress. Hence, the present study will not only provide data for assessment of disease incidence but also provide means to analyze the co-relation of stressful work routine with periodontitis amongst industrial workers in Lahore, Pakistan. The objective was to correlate stress with periodontal health and factors affecting the levels of stress for a worker.

METHODOLOGY

The present study included 200 male factory workers employed at metal injection molding factory in Lahore (Pakistan). The study was conducted in October, 2014. Ethical approval was sought from the factory administration and all the participants consented in writing to willingly participate in the study. Workers suffering from systemic diseases or unwilling were not included. This study was carried out using a self-designed pretested questionnaire, which consisted of demographic information. Stress variable was measured through 11 sub-questions each containing 5 options. These options were [1] Hardly any [2] A little [3] Some [4] A lot [5] A great deal, for every question. The score varied between 11 to 55. The score for an individual was calculated by adding the answers scores.

Subsequently the workers were also asked information such as oral hygiene practices, social and dietary habits, job routine and personal habits. Dental examinations were based on Community Periodontal Index and Treatment Needs protocol and were conducted using WHO probe. The dental examination was carried out by a single calibrated dentist to maintain reliability. Chi square test was applied to check the statistical significance between different variables. P value of less than 0.05 was considered significant.

RESULTS

A total of 200, male factory workers were examined with a mean age of 38.06 ± 9.87. The mean CPITN was 2.57±0.85 among the study sample. Table 1 represents
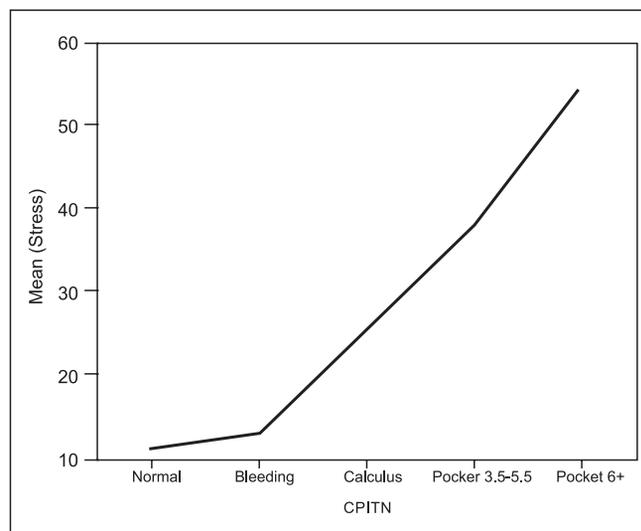

Fig 1: represents the association between CPITN and Stress

TABLE 1: SHOWS MEAN CPITN AND MEAN STRESS IN DIFFERENT AGE GROUPS

Age	CPITN	Stress	N
20-29	1.90 ± 0.82	25.98 ± 10.03	42
30-39	2.30 ± 0.66	28.64 ± 8.65	74
40-49	2.94 ± 0.64	37.71 ± 9.54	52
50-59	3.44 ± 0.56	46.19 ± 8.33	32
P value	Age & CPITN P value <0.001	Age and stress P value <0.001	Total 200

CPITN and stress p value < 0.001

mean CPITN and means Stress among different age groups. It also shows the p value between age and CPITN (<0.001), age and stress (<0.001) and CPITN and stress (<0.001). Fig 1 graphically illustrates the association between CPITN and mean stress. Table 2 represents the factors which affect the workers stress level.

DISCUSSION

Lahore is one of the industrial hubs of Pakistan. Sundar industrial estate is amongst the primary industrial areas of Lahore. More than 100 factories, consisting of textiles, chemicals, plastics, pharmaceuticals, edible products, engineering, packaging, pesticides, and rubber are located in this industrial estate. The outcomes of this study were able to draw attention towards certain elements of a factory workers routine which at first glance seemed quite trivial but the data reflection was quite on the contrary.

In the current study the periodontal health had a direct correlation with the stress which the factory workers were enduring at different level (P value <0.001). Another study shows a significant association

TABLE 2: SHOWS SOCIAL HABITS, WORK LOAD, EATING HABITS AND PERSONAL HABITS AFFECTING STRESS OF A WORKER

Social Habits affecting stress of a worker		
Smoking	**Stress**	**N**
Yes	25.38 ± 7.22	86
No	43.67 ± 7.09	114
P value	<0.001	Total 200
Betelnut	**Stress**	**N**
Yes	21.75 ± 2.21	185
No	33.48 ± 11.55	15
P value	<0.001	Total 200
Tobacco	**Stress**	**N**
Don't chew tobacco	34.19 ± 11.34	139
Chew tobacco	31.10 ± 11.86	61
P value	0.554	Total 200
Work Load		
Shift	**Stress**	**N**
Morning	34.05 ± 11.46	172
Night	28.29 ± 11.09	28
P value	0.176	Total 200
Job	**Stress**	**N**
Permanent	31.51 ± 10.47	81
Contract	35.79 ± 12.61	119
P value	0.038	Total 200
Work hours	**Stress**	**N**
8 hours and less	49.85 ± 5.42	40
8 hours and more	29.09 ± 8.55	160
P value	<0.001	Total 200
Eating Habits		
Meals	**Stress**	**N**
< 2 Meals	49.33 ± 4.95	84
2 Meals	35.51 ± 2.79	71
3 Meals	22.71 ± 6.60	45
P value	0.047	Total 200
Personal Habits		
Sleep	**Stress**	**N**
8 &< 8 hour	38.18 ± 8.74	148
>8 hour	19.19± 5.34	52
P value	0.015	Total 200
Brushing	**Stress**	**N**
Not daily	37.51 ± 13.01	43
Once daily	31.81 ± 10.79	149
Twice daily	37.13 ± 12.05	8
P value	0.049	Total 200

between stress and periodontal health status.[9] Satheesh in his study highlighted stress may be considered as an important risk factor for periodontal disease.[10]

The periodontal health deteriorated as the stress level increased in the industrial workers daily routine. The level of stress was linked with factors such as industrial worker's social habits, eating habits, personal habits and work load. These factors played a significant role in determining the periodontal status of the individual.

Smoking and betel nut chewing both have been implicated on numerous occasions for being involved in predisposing an individual to developing periodontal disease.[11] The present study endorses these claims with both giving highly significant results with a p value (<0.001) a shown in Table 2. But on the other hand tobacco chewing; which is normally considered a factor for predisposing periodontal disease[12]; is statistically insignificant correlated to stress (p value 0.554) in this study. This could be that only 61 people used tobacco and such a small group might not reveal a significant result.

Another factor which influenced stress was work load. Workers with jobs either permanent or contractual had a significant result on the stress level (p value 0.038). It was seen that workers who had contractual job were slightly more stressed as compared to workers who had permanent job (Table 2). Gaunt's study also indicates that men with job insecurity in contractual jobs were more stressed as compared to those who had permanent job.[13]

Work hours and stress were also strongly correlated. The current study shows that workers who worked for more than 8 hours were twice as much stressed as compared to workers who worked 8 or fewer hours a day. Härmä M in his study has highlighted the same association between stress and work hours as this study.[14]

The shift time either morning or night did not have a significant effect on the stress levels of the workers, even though the workers with night shift had a slightly lower stress levels as compared to morning shift workers.[15]

Another factor that influenced the level of stress was number of meals in a day (p value 0.047). The workers who had 3 meals a day had the least amount of stress but on the contrary the workers who ate one meal a day had twice as much stress as those who had 3 meals.[16]

Lack of sleep was another predisposing factor for stress (p value 0.015). The workers who slept less than 8 hours in a day were twice as much stressed as compared to those who slept more than 8 hours. Akerstedt in his study highlighted that disturbed sleep and lack

of continuous sleep is associated with stress and lack of productivity.[17]

The last factor which influenced stress in the current study was brushing habit (p value 0.049). Brushing is essential to keeping the gingiva healthy and prevents any underlying periodontal disease from progressing. Even though current study showed barely significant result but the level of stress among groups (not daily, once daily, twice daily) was nearly same. This leads to a conclusion that brushing habits are not directly associated with stress rather they are linked with periodontal disease.[18]

CONCLUSIONS

This study highlights the strong association of stress and periodontal disease. The associated factors like smoking, betel nut use, job contract, work hours, meals and sleep, were a contributing factors which increased the level of stress in industrial workers life and intern increase the periodontal disease. The results point towards a dire need for the health ministry to decrease the level of stress which would eventually also improve the periodontal health of the industrial worker.

REFERENCES

1   Stojanovich L. Stress and autoimmunity. Autoimmunity reviews. 2010; 9: A271-A6.

2   Chrousos GP. Stress and disorders of the stress system. Nature reviews endocrinology. 2009; 5: 374-81.

3   Sorensen CW. Over the Mountains are Mountains: Korean peasant households and their adaptations to rapid industrialization. University of Washington Press, 2013.

4   Hook G. Ramazzini: father of environmental health? Environmental health perspectives. 1995; 103: 982.

5   Genco RJ and Borgnakke WS. Risk factors for periodontal disease. Periodontology 2000. 2013; 62: 59-94.

6   Bartold P. Host Modulation For Managing Periodontitis. Current Issues In Periodontics. 2016: 64.

7   Edlin G and Golanty E. Health and wellness. Jones & Bartlett Publishers, 2012.

8   Henry JP and Stephens PM. Stress, health, and the social environment: A sociobiologic approach to medicine. Springer Science & Business Media, 2013.

9   Mannem S and Chava VK. The effect of stress on periodontitis: A clinicobiochemical study. Journal of Indian Society of Periodontology. 2012; 16: 365.

10 Sateesh C, Santhosh KR and Pushpalatha G. Relationship between stress and periodontal disease. J Dent Sci Res. 2010; 1: 54-61.

11 Javed F, Al-Hezaimi K, Tenenbaum HC, et al. Severity of periodontal disease in individuals chewing betel quid with and without tobacco. The American journal of the medical sciences. 2013; 346: 273-78.

12 Javed F, Ahmed HB and Romanos GE. Association between environmental tobacco smoke and periodontal disease: A systematic review. Environmental research. 2014; 133: 117-22.

13 Gaunt R and Benjamin O. Job insecurity, stress and gender: The moderating role of gender ideology. Community, Work and Family. 2007; 10: 341-55.

14 Härmä M. Workhours in relation to work stress, recovery and health. Scandinavian journal of work, environment & health. 2006: 502-14.

15 Williams C. Work-life balance of shift workers. Perspectives on labour and income. 2008; 20: 15.

16 Devine CM, Jastran M, Jabs J, Wethington E, Farell TJ and Bisogni CA. "A lot of sacrifices:" Work–family spillover and the food choice coping strategies of low-wage employed parents. Social science & medicine. 2006; 63: 2591-603.

17 Åkerstedt T, Knutsson A, Westerholm P, Theorell T, Alfredsson L and Kecklund G. Sleep disturbances, work stress and work hours: a cross-sectional study. Journal of psychosomatic research. 2002; 53: 741-48.

18 López R, Fernández O and Baelum V. Social gradients in periodontal diseases among adolescents. Community dentistry and oral epidemiology. 2006; 34: 184-96.

CONTRIBUTIONS BY AUTHORS

1	**Yousaf Athar:**	Research concept & design, manuscript preparation and review.
2	**Amna Sagheer:**	Project collaboration, data acquisition, data interpretation and manuscript review.
3	**Bilal Abdul Qayum Mirza:**	Literature review, project collaboration, data collection, and manuscript preparation, manuscript review, data analysis and interpretation, statistical analysis.
4	**Siti Lailatul Akram Zainuddin:**	Data collection, literature review.