Prevalence of Periodontal Diseases in Relation to Associated Risk Factors/ Indicators amongst Patients Attending a Government Dental Hospital in Kashmir

Roobal Behal[1], Syed Saima[2], Suhail Majid Jan[3]

ABSTRACT

Introduction: Periodontal diseases are chronic infections caused by pathogenic bacteria resulting in destruction of the supporting structures of the teeth, including the periodontal ligament, bone, cementum and soft tissues. So the aim of the present study was to evaluate periodontal disease prevalence and associated risk factors/ indicators amongst patients attending a Government Dental Hospital in Kashmir**.**

Material and Methods: The study was based on 1024 patients selected from the Department of Periodontics, Government Dental College and Hospital, Srinagar. Participants were interviewed for demographic characteristics and known risk factors/ indicators based on a Performa prepared for the study. Community periodontal index (CPI) component of CPITN index was used to assess periodontal status of subjects.

Results: The findings revealed that 68.16% of the subjects had CPI score ≤2 (non-periodontitis), while 31.82% were found to have a CPI score of ≥3 (periodontitis). The factors found to be significantly associated with periodontal status were age, gender, occupation, smoking, diabetes, arthritis, cardiovascular disease, kidney disease, stress and medications.

Conclusions: This study revealed that about one-third of study population had periodontitis and it was observed that socio-demographic risk factors/indictors were associated with increased risk of periodontitis.

Keywords: Periodontal Disease, Oral Health, risk factors, smoking, systemic factors

INTRODUCTION

It results from a complex interplay between specific gram-negative microorganisms, their by products and the host-tissue response, which ultimately lead to the progressive destruction of the periodontal ligament and alveolar bone.[1,2] Periodontal disease is a major cause of tooth loss leading to edentulism and thus has a negative impact on individuals' quality of life. Both local and systemic factors contribute to the initiation and progression of periodontal infections. Dental plaque and plaque retentive areas such as dental calculus and defective restorations are the associated local factors[3] Approximately 500 different bacterial entities and various human viruses have already been associated with dental plaque.[4] Different systemic risk factors for periodontal disease have been reported to be associated with systemic conditions such as diabetes mellitus, rheumatoid arthiritis, cardiovascular disease, respiratory diseases, kidney disease and also established with other factors such as tobacco use, osteoporosis, certain cancers, erectile dysfunction and dementia.[5-7]

Periodontal diseases affect more than one tooth in 80% of adults worldwide. The prevalence of periodontal diseases was reported to be upto 98% and 31% advanced periodontitis.[8] A positive correlation for periodontal disease was found among the female gender.[9] Prevalence of periodontitis associated with a healthy lifestyle is lower when compared to unhealthy lifestyle.[10] Age is also an important risk factor for periodontal disease.[11]

Community periodontal index of treatment need (CPITN) is the most commonly used index for estimation of the prevalence of periodontitis. This index was developed specially by joint committee of World Health Organization (WHO) and Federation Dentaire International (FDI) to evaluate the periodontal status and treatment need at a community level.[12] The present study was done to evaluate periodontal disease prevalence and associated risk factors/ indicators amongst patients attending a Government Dental Hospital in Kashmir**.**

MATERIAL AND METHODS

This study was conducted in the Department of Periodontics, Government Dental College and Associated Hospitals, Srinagar, Jammu and Kashmir between June, 2016 and September, 2016. Ethical approval was obtained from Institutional Review Board of the concerned Hospital and an informed consent was acquired from all the subjects who were willing to participate. The participation was voluntary after the aim of the present study was communicated to the participants. The study was based on 1024 patients who were selected as a result of systematic random sampling. Every alternate patient attending the Department of Periodontics, Government Dental College and Associated Hospitals, Srinagar was screened for inclusion criteria. These included patients of any age, gender, socioeconomic status, who gave consent. Participants were interviewed and examined for periodontal status. Demographic characteristics and known risk factors/ indicators and periodontal status were recorded based on a Performa prepared for the study. Community periodontal index (CPI)[12] was used to assess periodontal status. The index teeth included were 11, 16/17, 26/27, 31, 36/37 and 46/47, which were examined at mesial and distal proximal sites on buccal and lingual/ palatal sides. CPI ≥ "code 3," was considered as periodontitis which indicates that more than one site had a 3.5 mm pocket or larger in the index teeth. CPI scores ≤2 was

[1]Consultant, [2]Registrar, [3]Professor and Head, Department of Periodontics, Government Dental College and Hospital, Shireen Bagh, Srinagar, J&K-190010

Corresponding author: Dr. Roobal Behal, Department of Periodontics, Government Dental College and Hospital, ShireenBagh, Srinagar, J&K-190010, India.

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considered as non periodontitis.

STATISTICAL ANALYSIS

Data were entered into an Excel Sheet database (MS Office Excel 2000; Microsoft Corporation, Redmond, WA, USA). The Data was analyzed using Minitab 16.1.1 version of statistical software. Statistical analysis was performed using the Chi-square test for comparison of periodontitis and non-periodontitis patients, $P \leq 0.05$ was considered statistically significant.

RESULTS

Table 1 shows the Demographic/medical information of study participants. Periodontitis was observed in 62% males, 83% nonsmokers, Majority (41%) were from labor class, and 56% were from age group 21 to 40 years. Table 2 shows the Frequency of subjects with CPI scores. Table 3 presents the distribution of study subjects with CPI scores ≤2 and ≥3. Mean age of patients was 27.2±10.8 years of non periodontitis and 39.8±17.7 years of periodontitis group. The findings revealed that 68.16% of the subjects had CPI score ≤2 (non periodontitis), whereas 31.82% were found with CPI score ≥3 (periodontitis). Age, gender, occupation, smoking, diabetes, arthritis, CVD, kidney disease and stress were significantly associated with periodontal status.

DISCUSSION

This study reports the periodontal status and the associated risk factors/ indicators amongst general population visiting a Govt. Dental Hospital. The reason of assessing the prevalence of periodontal disease using Community periodontal Index (CPI) was because it is simple, inexpensive and less time consuming. The prevalence of periodontitis (31.82%) in the present study are in accordance with the findings of the study conducted by Joseph and Cherry[13] in Trivandrum, India where it was reported that 27% of the subjects had periodontitis and according to a survey conducted by Doifode VV et al.[14] in Nagpur, Maharashtra where periodontitis was reported to be 34.8%. However, the findings were contradictory to previous studies conducted by D.Kundu et al.[15] where prevalence of periodontitis was found to be 97.51%.

In the present study, age was found to be an important risk factor for periodontal disease. Furthermore, in many previous studies when the relationship of age and periodontal disease was assessed it was observed that the severity of periodontal disease was increased with the advancing age.[15,16] These findings could be accredited to the general deterioration in immune function and tissue integrity with advancing age which increases the vulnerability to the periodontal disease. On assessing the relationship of gender and periodontal disease, It was observed that gender was a contributing factor for periodontitis. Males were shown to have a higher predilection towards periodontitis with the male to female ratio of patients with periodontitis (1.63:1). The findings were similar to a previous study.[17] Doifode et al.[14], Kundu D et al.[15], and TS Sekhon et al.[18] have reported that periodontal disease was more common in males, which can be attributed to the deleterious oral habits which are more prevalent in male population. Habits like smoking and pan with tobacco chewing was shown to be a significant risk factor for more prevalence of periodontal diseases.[19]

The prevalence of periodontitis was observed to be higher among smokers, which was in agreement with other studies.[20] Smoking causes an alteration of the caliber of the blood vessels perfusing the gingival tissues. Reduced bleeding reflects an underlying disruption of the immune response and that this may account for the increased loss of clinical attachment and alveolar bone.[21] Tobacco causes increased colonization of shallow periodontal pockets by periodontal pathogens and increased levels of periodontal pathogens in deep periodontal pockets. Smoking may alter neutrophil chemotaxis, phagocytosis and oxidative burst. It can also increase the secretion of tumor necrosis factor alpha, prostaglandin E_2, neutrophil collagenase and elastase in gingival crevicular fluid.[22]

The results of our study have shown that a greater prevalence and severity of periodontal diseases in patients with renal disease. Similar results have been found by many studies.[23] However, conflicting reports are available where it failed to detect any difference in the periodontal health in patients undergoing hemodialysis.[24] The systemic disease burden could have also influenced the progression of periodontal disease in

Variables		Frequency Total = 1024 (100%)
Age	≤20 years	302 (29)
	21-40 years	591 (58)
	41-60 years	103 (10)
	>60 years	28 (3)
Gender	Males	722 (71)
	Females	302 (29)
Occupation	Student	143 (14)
	Housewife	243 (24)
	Labour	399 (39)
	Professional	122 (12)
	Business	80 (8)
	Retired/no work	37 (3)
Smoking	Yes	856 (83)
	No	
Tobacco	Yes	988 (96)
	No	
Diabetes	Yes	903 (88)
	No	
CVD	Yes	922 (90)
	No	
Respiratory disease	Yes	972 (95)
	No	
Kidney	Yes	1023 (99.9)
	No	
Arthritis	Yes	1015 (99)
	No	
Hepatitis	Yes	1005 (98)
	No	
Stress	Yes	994 (97)
	No	

Table-1: Demographic and medical variables of study participants

CPI scores	*n* (%)
1	88 (7.9)
2	610 (59.2)
3	276 (26.8)
4	50 (488)
Total	1024 (100)

Table-2: Frequency of subjects with CPI scores

Variables		Subjects (%)with CPI score ≤2 (n=698) (68.16%)	Subjects (%) with CPI score ≥3 (n=326) (31.82%)	Chi-square test P
Age (years)	≤20 years (n=302)	40	8	<0.001
	21-40 years (n=591)	53	56	
	41-60 years (n=103)	5	30	
	>60 years (n=28)	2	6	
	Mean±SD	27.2±10.8	39.8±17.7	
Gender	Males (n=722)	66	62	0.034
	Females (n=302)	34	38	
Occupation	Student (n=143)	29	6	0.032
	Housewife (n=243)	12	29	
	Labor (n=399)	36	41	
	Professional (n=122)	15	11	
	Business (n=80)	7	8	
	Retired (n=37)	1	5	
Smoking	No (n=856)	88	83	<0.001
	Yes (n=168)	12	17	
Tobacco	No (n=988)	98	97	0.025
	Yes (n=36)	2	3	
Diabetes	No (n=903)	99	92	<0.001
	Yes (n=121)	1	8	
CVD	No (n=922)	98	96	<0.001
	Yes (n=102)	2	4	
Respiratory disease	No (n=972)	99	97	0.057
	Yes (n=52)	1	3	
Kidney diseases	No (n=1023)	100	98	0.001
	Yes (n=1)	0	2	
Arthritis	No (n=1015)	99	98	0.002
	Yes (n=9)	1	2	
Hepatitis	No (n=1005)	98	97	0.072
	Yes (n=19)	2	3	
Stress	No (n=994)	99	96	<0.001
	Yes (n=30)	1	4	

Table-3: Status of CPI and risk factors/indicators associated with periodontitis

these patients.

In our study periodontitis was more prevalent amongst subjects with diabetes as compared to non diabetics. Significant prevalence of periodontitis was reported to be associated with diabetes mellitus in previous studies.[6,25] The reason might be attributed to the reason that diabetes can lead to aggravation of periodontal infection and exaggerated bone loss. The increase in blood glucose level is associated with periodontitis in diabetic patients.[3,26]

Anxiety as well as other emotional or psychosocial stresses have been shown to have significant adverse effects on the proper functioning of the immune system.[3,27] In the present study higher prevalence of periodontitis was observed amongst patients with arthritis The reason might be attributed to lack of manual dexterity in arthiritis patients which prevents them to maintain their oral hygiene. In the present study higher prevalence of periodontitis was observed amongst patients with CVD. Increased level of systemic inflammation as a result of an increase in the levels of C-reactive protein (CRP) and other biomarkers is observed in Chronic periodontitis.[28] The use of CPI or CPITN index as a means to observe the periodontal status of the individuals in this study has a limitation that it underestimates the actual prevalence of periodontal disease and it is a treatment need–based index which does not give true prevalence rates in terms of severity and extent of the disease.

CONCLUSION

This study revealed that about one-third of study population were having periodontitis and it was observed that socio-demographic risk factors/indictors were associated with increased risk of periodontitis. It is thereby recommended for the clinicians to have a broader view regarding the factors which can affect the oral cavity in order to aid their patients in preventing periodontal diseases. Therefore, it needs to be emphasized that further prospective, studies using a proper study design are warranted to assess the true prevalence rate of periodontal disease.

REFERENCES

1. Shewale AH, Gattani DR, Bhatia N, Mahajan R, Saravanan SP. Prevalence of Periodontal Disease in the General Population of India-A Systematic Review. Journal of Clinical and Diagnostic Research. 2016;10:ZE04-ZE09.
2. Rosamma Joseph, Rajaratnam Krishnan, Vivek Narayan. Higher prevalence of periodontal disease among patients with predialytic renal disease. Braz J Oral Sci. 2009 8:14-8.
3. Abhishek Mehta. Risk factors associated with periodontal diseases and their clinical considerations. Int J Contemp Dent Med Rev. 2015;1-5.
4. Amar S, Han X. The impact of periodontal infection on

systemicdiseases. Med SciMonit. 2003;9: RA291-9.
5. Haseeb M, Khawaja KI, Ataullah K, Munir MB, Fatima A. Periodontal disease in type 2 diabetes mellitus. J Coll Physicians Surg Pak. 2012;22:514-8.
6. Apoorva SM, Sridhar N, Suchetha A. Prevalence and severity of periodontal disease in type 2 diabetes mellitus (non-insulin-dependent diabetes mellitus) patients in Bangalore city: An epidemiological study. J Indian Soc Periodontol. 2013;17:25-9.
7. Deshpande K, Jain A, Sharma R, Prashar S, Jain R. Diabetes and Periodontitis. J Indian Soc Periodontol. 2010;14:207-12.
8. Ali M. Prevalence of periodontal disease among secondary schoolchildren (9-18 years). Ann Abbasi Shaheed Hosp Karachi Med Dent Coll. 2004;9:521-3.
9. Cortelli JR, Cortelli SC, Pallos D, Jorge AO. Prevalence of aggressive periodontitis in adolescents and young adults from Vale doParaíba. Pesqui Odontol Bras. 2002;16:163-168.
10. Gundala R, Chava VK. Effect of lifestyle, education and socioeconomic status on periodontal health. Contemp Clin Dent. 2010;1:23-26.
11. Kaimenyi JT, Gururaja TR. Periodontal health status of adultpopulation of Kenya and India. Indian Soc Periodontol. 1982;2:17-20.
12. Ainamo J, Brames D, Beagrie G, Cutress J, Martin J. Development of World Health Organization (WHO) Community PeriodontalIndex of Treatment Needs (CPITN). Int Dent J. 1982;32:281-91.
13. Joseph PA, Cherry RT. Periodontal treatment needs in patients attending dental college hospital, Trivandrum. J Indian Soc Periodontol. 1996;20:67-71.
14. Doifode VV, Ambadekar NN, Lanewar AG. Assessment of oral health status and its association with some epidemiological factors in population of Nagpur, India. Indian J Med Sci. 2000;54:261–69.
15. Kundu D, Mehta R, Rozra S. Periodontal status of a given population of West Bengal: An epidemiological study. J Indian SocPeriodontol. 2011;15:126–29.
16. Kumar S, Dagli RJ, Chandrakant D, Prabu D, Suhas K. Periodontal status of green marble mine labourers in Kesariyaji, Rajasthan, India. Oral Health Prev Dent. 2008;6:217-21.
17. Susin C, Dalla Vecchia CF, Oppermann RV, Haugejorden O, Albandar JM. Periodontal attachment loss in an urban population of Brazilian adults: Effect of demographic, behavioral, and environmental risk indicators. J Periodontol. 2004;75:1033-41.
18. Sekhon TS, Grewal S, Gambhir RS. Periodontal health status and treatment needs of the rural population of India: a cross-sectional study. J Nat Sci Biol Med. 2015;6:111–15.
19. Parmar G, Sangwan P, Vashi P, Kulkarni P, Kumar S. Effect of chewing a mixture of areca nut and tobacco on periodontal tissues and oral hygiene status. J Oral Sci. 2008; 50:57-62.
20. Haffajee AD, Socransky SS. Relationship of cigarette smoking to attachment level profiles. J Clin Periodontol. 2001;28:283-95.
21. Mirbod SM, Ahing SI, Pruthi VK. Immunohistochemical study of vestibular gingival blood vessel density and internal circumference in smokers and non-smokers. J Periodontol. 2001;72:1318-23.
22. Newman MG, Takei HH, Carranza FA. Clinical Periodontology. St Louis, Missouri 63043: WB Saunders Company; 2002. p. 245-52.
23. Rahmati MA, Craig RG, Homel P, Kaysen GA, Levin NW. Serum markers of periodontal disease status and inflammation in hemodialysis patients. Am J Kidney Dis. 2002;40:983-9.
24. Bayraktar G, Kurtulus I, Duraduryan A, Cintan S, Kazancioglu R, Yildiz A et al. Dental and periodontal findings in hemodialysis patients. Oral Diseases. 2007;13:393-7.
25. Deshpande K, Jain A, Sharma R, Prashar S, Jain R. Diabetes and periodontitis. J Indian Soc Periodontol. 2010;14:207-12.
26. Tomar SL, Asma S. Smoking-attributable periodontitis in the United States: Findings from NHANES III. National Health and Nutrition Examination Survey. J Periodontol 2000;71:743-51.
27. Linden GJ, Mullally BH, Freeman R. Stress and the progression of periodontal disease. J Clin Periodontol. 1996;23:675-80.
28. Paraskevas S, Huizinga JD and Loos BG. A systematic review and meta-analyses on C-reactive protein in relation to periodontitis. J Clin Periodontol. 2008;35:277-90.

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