



Awareness Regarding Interrelationship of Periodontal Disease and Systemic Health among General Dentists

C. Sri Sanjhanaa

Department of Periodontics Tagore Dental College and Hospital

OPEN ACCESS

Key Words

Periodontal disease, cardiovascular diseases, several systemic disorders

Corresponding Author

C. Sri Sanjhanaa,
Department of Periodontics Tagore
Dental College and Hospital
sanjanachandran96@gmail.com

Received: 20 August 2024

Accepted: 20 November 2024

Published: 27 November 2024

Citation: C. Sri Sanjhanaa, 2024. Awareness Regarding Interrelationship of Periodontal Disease and Systemic Health among General Dentists. Res. J. Med. Sci., 18: 345-349, doi: 10.36478/makrjms.2024.12.345.349

Copy Right: MAK HILL Publications

ABSTRACT

It is increasingly clear that systemic health and periodontal disease are significantly correlated. Several systemic disorders, like diabetes mellitus (DM), cardiovascular diseases and unfavorable pregnancy outcomes, have been linked to periodontitis. Additionally, it has been proposed that treating periodontal disease could help glycemic control in Diabetic patients. Dentists play a critical role in educating patients about this systemic link. To assess awareness among general dentists about interrelationship between systemic health and periodontal disease. A web-based questionnaire survey containing 15 questions on general awareness about periodontitis and its impact on systemic health. To determine if the variables were related, the chi square test was employed. The general awareness of periodontal disorders was shown to be statistically significant ($P < 0.001$). Systemic and periodontal illnesses were revealed to have two-way associations that were statistically significant at $P < 0.001$. Hormonal alterations and periodontal disorders were also evaluated, and the results were significant at $P < 0.001$. The finding was significant at $P = 0.002$, with 44.3% of participants being unaware that unshielded pacemakers shouldn't be treated using piezoelectric ultrasonic scalers. In order to improve the general health of the patient, efforts should be made to improve the awareness among dentists regarding the association between periodontal disease and systemic health.

INTRODUCTION

A major public health concern, periodontal disease is pervasive and adds much to the worldwide burden of chronic disorders. For general well-being, oral health, especially periodontal health, is essential. Strong links exist between periodontitis and a number of systemic diseases, including diabetes, heart disease and unfavorable pregnancy outcomes. Overall health may be impacted by systemic inflammation brought on by periodontitis. Periodontal disease may only be effectively prevented and managed with knowledge of its origins, early symptom diagnosis and appropriate treatment^[1]. Periodontal disease is a chronic inflammatory multifactorial disease, which is predominantly Gram-negative infection. Plaque biofilm causes gingivitis, which can lead to periodontitis and, if untreated, tooth loss. Gram-negative infections are a prominent cause of periodontal disease because of the possibility that these microbes and their toxins, including lipopolysaccharides, can spread through the sulcular epithelium, enter the systemic circulation and cause a significant vascular reaction^[2-4]. The connection between periodontal inflammation and a number of systemic disorders may be explained by this host response. Periodontal disorders are caused by a number of factors, including diabetes, smoking and stress. Hormonal changes in women are another element linked to this condition^[5]. Research has indicated that periodontitis is linked to women's hormonal changes during adolescence, menstruation, pregnancy and its frequency, lactation and menopause^[6]. Progesterone and estrogen are examples of these endogenous hormones^[7]. Due to the etiological role of sex steroids in changing the gingival bacterial population, higher levels of these hormones are linked to an increase in gingivitis^[8]. The vital connection between a balanced diet and preserving healthy gingiva has been highlighted in numerous researches. Studies have looked into the relationships between dietary variables, gingival health and tooth loss. Additionally, a number of vitamins, minerals and trace elements have been discovered to affect the regeneration of periodontal tissues and the formation of new bone^[9]. Even though the association between periodontal disease and general health is becoming more and clearer, people are still notably unaware of this connection. Thus, the goal of the current study is to determine how well-informed the general public was about the link between non-communicable systemic diseases and periodontal disease.

MATERIALS AND METHODS

A nationwide cross-sectional survey was conducted among general dentists in Chennai via web-based questionnaire containing 15 questions. The questions were divided into 4 sections,

- General awareness about periodontitis.
- Awareness about diabetes mellitus and periodontium
- Hormonal influences on periodontium.
- General awareness on cardiovascular disease and periodontium.

The individuals were allowed to answer from any of the three options: yes, no, don't know. The questionnaires were evaluated for their responses.

Data Processing: The distribution of questionnaire responses by research participants was compared using the chi square Goodness of Fit test.

RESULTS AND DISCUSSIONS

A total of 106 responses were collected and assessed. According to the results of these 106 tests, the majority of study participants (72.6%) were aware of the signs and symptoms of periodontal disease, which include pus discharge, bleeding gums and mobile teeth. While 67% of study participants think that periodontal disorders can also cause bad breath, over 65% of individuals were aware that these conditions are preventable and over 54.7% think that they are inherited. These results about general knowledge of periodontal diseases are statistically significant ($p < 0.001$) (Table 1).

The majority (80.2%) knew that improved dental health can result in better general health. The fact that gingival bleeding and mouth ulcers can result from dietary deficits was also known by 72.6% of participants. A significant proportion of participants (81.1%) were aware that patients with high blood glucose levels are more likely to develop periodontal disease and 63.2% were aware that blood glucose levels diabetes mellitus patients can be impacted by periodontal disease. These results regarding the relationship between periodontal disorders and systemic health are statistically significant at $p < 0.001$ (Table 2).

An analysis of the relationship between hormonal shifts and periodontal diseases revealed that 62.3% of participants thought that pubertal hormones were linked to gingivitis in adolescents. Additionally, 72.6% of them were aware that there is a higher risk of gingival bleeding and enlargement during pregnancy, and they also believed that gingival modifications may be linked to hormonal changes in female patients. Additionally, over 75% of participants knew that low birth weight babies and early deliveries can result from periodontal illnesses. At $p < 0.001$, these results regarding the relationship between hormonal shifts and periodontal disorders are statistically significant (Table 3).

Nearly 70% of the participants preferred stopping aspirin before oral prophylaxis and 66% of them were

Table 1: Comparison of Distribution in Responses to Questions on General Awareness Regarding Periodontal Diseases Using Chi Square Goodness of Fit Test.

Questions	Responses	n	%	χ^2 value	p-value
1. Are you aware of the symptoms of periodontal disease like bleeding gums, mobile teeth and pus discharge?	Yes	77	72.6%	79.943	<0.001*
	No	25	23.6%		
	Don't know	4	3.8%		
2. Do you think that periodontal diseases are preventable?	Yes	73	68.9%	63.415	<0.001*
	No	24	22.6%		
	Don't know	9	8.5%		
3. Do you think that periodontal diseases are hereditary?	Yes	58	54.7%	31.377	<0.001*
	No	37	34.9%		
	Don't know	11	10.4%		
4. Do you think that periodontal diseases can also be the reason for bad breath?	Yes	71	67.0%	58.094	<0.001*
	No	26	24.5%		
	Don't know	9	8.5%		

Table 2: Comparison of Distribution in Responses to Questions on Interlink Between Systemic Health and Periodontal Diseases Using Chi Square Goodness of Fit Test

Questions	Responses	n	%	χ^2 value	p-value
5. Are you aware that good oral health can lead to improvement in overall health of an individual?	Yes	85	80.2%	106.434	<0.001*
	No	16	15.1%		
	Don't know	5	4.7%		
6. Are you aware that nutritional deficiencies in diet can lead to oral ulcers and gingival bleeding?	Yes	77	72.6%	77.792	<0.001*
	No	23	21.7%		
	Don't know	6	5.7%		
7. Do you know that patients with high blood glucose level have higher incidence of periodontal disease?	Yes	86	81.1%	111.019	<0.001*
	No	16	15.1%		
	Don't know	4	3.8%		
8. Do you know that periodontal disease can affect blood glucose level in diabetes mellitus?	Yes	67	63.2%	43.717	<0.001*
	No	24	22.6%		
	Don't know	15	14.2%		

Table 3: Comparison of Distribution in Responses to Questions on Interlink Between Hormonal Changes and Periodontal Diseases Using Chi Square Goodness of Fit Test

Questions	Responses	n	%	χ^2 value	p-value
9. Do you think adolescent patient with gingivitis are related to pubertal hormones?	Yes	66	62.3%	40.151	<0.001*
	No	22	20.8%		
	Don't know	18	17.0%		
10. Do you know that there is increased tendency for gingival bleeding and gingival enlargement during pregnancy?	Yes	77	72.6%	74.396	<0.001*
	No	18	17.0%		
	Don't know	11	10.4%		
11. Do you think that gingival alterations during puberty, pregnancy and menopause are associated with physiological hormone changes in female patients?	Yes	77	72.6%	73.83	<0.001*
	No	16	15.1%		
	Don't know	13	12.3%		
12. Are you aware that periodontal diseases can cause premature deliveries and low birth weight babies?	Yes	80	75.5%	84.755	<0.001*
	No	14	13.2%		
	Don't know	12	11.3%		

Table 4: Comparison of Distribution in Responses to Questions on Awareness of Complications & Precautions Towards Cardiac Patients with Periodontal Diseases Using Chi Square Goodness of Fit Test

Questions	Responses	n	%	χ^2 value	p-value
13. Are you aware that microbes causing periodontal disease can lead to narrowing of blood vessels supplying the heart, leading to various heart diseases?	Yes	70	66.0%	54.642	<0.001*
	No	26	24.5%		
	Don't know	10	9.4%		
14. Can you treat patients with unshielded pacemakers using piezoelectric ultrasonic scaler?	Yes	47	44.3%	12.019	0.002*
	No	40	37.7%		
	Don't know	19	17.9%		
15. Do you prefer withdrawal of aspirin before oral prophylaxis?	Yes	74	69.8%	71.623	<0.001*
	No	28	26.4%		
	Don't know	4	3.8%		

aware that bacteria that cause periodontal disease can cause the blood arteries supplying the heart to narrow, resulting in a variety of heart problems. The significance level for these results was $p < 0.001$. The

finding was significant at $p = 0.002$ and 44.3% of participants were unaware that unshielded pacemakers shouldn't be treated using a piezoelectric ultrasonic scaler (Table 4).

A complex illness, periodontitis is brought on by the interplay of bacterial infections and the host's reaction to bacterial threats. According to estimates, an adult's mouth can harbor over 500 different types of bacteria. Since they were the first to notice oral health issues in patients while practicing^[10], medical professionals should be knowledgeable about periodontal disease. Additionally, recent research has shown a link between periodontal diseases and systemic diseases like diabetes, coronary heart disease and preterm low birth weight babies. Given the effects of poor oral health in general and periodontal health in particular on an individual's overall health and the resulting impact on that individual's quality of life, medical professionals must gain a better understanding of the etiopathogenesis of periodontal disease and the range of treatment options available^[4]. 72.6% of the participants in this research are aware of the signs and symptoms of periodontitis. Eighty-two percent of participants understood the significance of periodontal care and seventy-six percent were aware that gingival bleeding and oral ulcers can result from dietary deficits. Responses to the awareness survey about the link between systemic disorders and periodontitis were statistically significant. According to a survey by Pralhad and Thomas among Karnataka medical experts, 88.7% of the professionals said that diabetes is a risk factor for periodontal disease^[11]. Sixty-six of the medical experts in this study knew that pubertal hormones are linked to gingivitis. Eighty of the participants knew that preterm low birth weight is a result of periodontal disease. Similar findings were found in a study by Patil *et al.*, which found that 82% of Karnataka's medical professionals were aware of this association^[11]. The awareness of the association between heart disease and periodontitis has also been evaluated by our study. Of the 106 general dentists who took part, 70 were aware that bacteria that cause periodontitis constrict the blood arteries supplying the heart, resulting in a variety of heart problems. Nearly 70% of them would prefer to stop using aspirin before receiving oral prophylactics. The fact that a piezoelectric ultrasonic scaler should not be used to treat unshielded pacemakers was unknown to 47 dentists. Acute myocardial infarction risk is 11% higher in people with severe periodontal disease, according to studies^[12]. Additionally, there is a 3% higher chance of coronary heart disease when tooth loss, a common end-stage consequence of periodontal disease, occurs^[13]. Compared to healthy controls, people with periodontal disease have higher mean systolic (3.36mmHg) and diastolic (2.16mmHg) blood pressure^[14]. Furthermore, a higher likelihood (2.3) of receiving a diagnosis of hypertension (systolic blood pressure >140mmHg) was linked to periodontal disease^[14]. Remarkably, the mean systolic and diastolic

blood pressure decreased by 12.57mmHg and 9.65 mm Hg, respectively, six months following periodontal disease treatment^[15]. It is advised that continuing medical education programs be offered to medical practitioners in an effort to keep them up to date on the relationship between systemic and periodontal diseases as well as other components of dental health care treatment techniques. In order to raise medical professionals' awareness of oral health and its significance, a proactive national approach must be implemented. Such surveys would be very helpful in identifying the medical professionals who have the best understanding of oral health and in focusing on the areas of oral health where the best information is lacking.

CONCLUSION

Treating periodontitis is known to decrease the risk of cardiovascular accidents like atherosclerosis in cardiac patients and also found to influence the premature childbirth and decreased birth weight of the babies. Efforts to increase the awareness about interrelationship between systemic health and periodontal disease among dentists may prove valuable in improving the overall health of the patient.

REFERENCES

1. Hemalatha, D.M., A. Melath, M. Feroz, K. Subair, A. Mohandas and N. Chandran., 2020. A survey on the awareness of interrelationship of periodontal disease and systemic health among Mahe population. *J. Indian Soc. Periodontology*, Vol. 24 .10.4103/jisp.jisp_286_19.
2. Mealy, B.L. and P.R. Klokkevold., 2004. 1. Carranza's Clinical Periodontology. In: *Periodontal medicine.*, Elsevier Publishers, New Delhi, ISBN-14: 978-0721683317, 0 pp: 229-244.
3. Page, R.C. and J.D. Beck, 1997. Risk assessment for periodontal diseases. *Int. Dent. J.*, 47: 61-87.
4. Shah, M.N., S. Anwar, A. Khalil and S. Akhtar., 2013. Periodontal disease awareness among medical doctors. *JKCD.*, 4: 34-37.
5. Knight, E.T., J. Liu, G.J. Seymour, C.M. Faggion and M.P. Cullinan, 2016. Risk factors that may modify the innate and adaptive immune responses in periodontal diseases. *Periodontology 2000*, 71: 22-51.
6. Amar, S. and K.M. Chung, 1994. Influence of hormonal variation on the periodontium in women. *Periodontology 2000*, 6: 79-87.
7. Mariotti, A., 1994. Sex Steroid Hormones and Cell Dynamics in the Periodontium. *Crit. Rev. Oral Biol. & Med.*, 5: 27-53.
8. Kumar, P.S., 2012. Sex and the subgingival microbiome: Do female sex steroids affect periodontal bacteria? *Periodontology 2000*, 61: 103-124.

9. Najeeb, S., M. Zafar, Z. Khurshid, S. Zohaib and K. Almas, 2016. The Role of Nutrition in Periodontal Health: An Update. *Nutrients*, Vol. 8 .10.3390/nu8090530.
10. Mundhe, P.G., S.N. Rajhans, S.N. Sheikh, N.N. Moolya, N. Mhaske and D.N. Gutte, 2015. Periodontal diseases and treatment from perspective of medical professionals: A survey study. *Int. J. Med. Res. And Health Sci.*, 4: 193-196.
11. Pralhad, S. and B. Thomas, 2011. Periodontal awareness in different healthcare professionals: A questionnaire survey. *J. Educ. Ethics Dent.*, 1: 64-67.
12. Cho, H.J., M.S. Shin, Y. Song, S.K. Park, S.M. Park and H.D. Kim, 2021. Severe Periodontal Disease Increases Acute Myocardial Infarction and Stroke: A 10-Year Retrospective Follow-up Study. *J. Dent. Res.*, 100: 706-713.
13. Cheng, F., M. Zhang, Q. Wang, H. Xu and X. Dong *et al.*, 2018. Tooth loss and risk of cardiovascular disease and stroke: A dose-response meta analysis of prospective cohort studies. *PLOS ONE*, Vol. 13 .10.1371/journal.pone.0194563.
14. Aguilera, E.M., J. Suvan, M. Orlandi, Q.M. Catalina, J. Nart and F. D'Aiuto, 2021. Association Between Periodontitis and Blood Pressure Highlighted in Systemically Healthy Individuals. *Hypertension*, 77: 1765-1774.
15. Zhou, Q., W. Xia, J. Ren, B. Yu and X. Tong *et al.*, 2017. Effect of Intensive Periodontal Therapy on Blood Pressure and Endothelial Microparticles in Patients With Prehypertension and Periodontitis: A Randomized Controlled Trial. *J. Periodontology*, 88: 711-722.