



## RESEARCH ARTICLE

# Awareness about Periodontal Disease and Its Association with Systemic Disease among Medical Practitioners: A Pilot Study

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## ABSTRACT

**Background:** For decades, physicians and dentists have paid close attention to their own respective fields, specializing in medicine pertaining to the body and the oral cavity respectively. However, recent findings have strongly suggested that oral health may be indicative of systemic health. Currently, this gap between allopathic medicine and dental medicine is quickly closing, due to significant findings supporting the association between periodontal disease and systemic conditions.

**Aim:** The aim of the study is to evaluate knowledge of medical practitioners about periodontal disease and its association with systemic disease.

**Materials and methods:** This study was carried out using a self-reported questionnaires that was distributed to 120 practicing medical doctors of various fields. There were 68 male and 52 female doctors. Among which, 63 doctors have less than 10 years of experience, 47 doctors have 10 to 20 years, and 10 doctors have more than 20 years experience.

**Conclusion:** Although the vast majority of the medical doctors reported that they knew the relationship between periodontal disease and systemic health, this awareness was not supported by precise knowledge and failed to appropriate clinical practice. Interdisciplinary dental and medical training will likely be solution to the problem.

**Keywords:** Awareness, Periodontitis, Systemic conditions, Systemic diseases.

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**Conflict of interest:** None

## INTRODUCTION

Periodontitis is a multifactorial inflammatory disease that occurs in the tissues surrounding the teeth in response to bacterial accumulations, or dental plaque, on

the teeth.<sup>1</sup> The bacterial accumulation is predominantly Gram-negative, resulting in an inflammatory response from the body. It has a potential in vascular dissemination of microorganisms through the sulcular epithelium and their products, such as lipopolysaccharides (LPS) throughout the body.<sup>2</sup> Literature evidence began to suggest a possible link between periodontitis and a number of systemic diseases decades ago.<sup>3</sup> Periodontitis acts as a potential source of infection and is considered as a separate risk factor for cardiovascular diseases, cerebrovascular diseases, peripheral arterial disease, respiratory diseases, and low birth weight.<sup>4</sup> Many medical professionals are unfamiliar with the oral diseases and oral health research. They do not recognize the potential infection that may exist within the oral cavity and its influence on systemic disease.<sup>2</sup> In India, the occurrence of periodontitis is high and its deleterious association with systemic disease, and patients receiving appropriate education and guidance is low. In India where the dentist to population ratio is 1:30,000 in urban areas and 1:150,000 in rural areas, medical practitioners have to take care of the oral health needs of people.<sup>5</sup> Hence, this study was carried out to evaluate the awareness about systemic effects of periodontal disease among medical practitioners, for better interdisciplinary understanding and comprehensive treatment for patients.

## MATERIALS AND METHODS

In order to know the level of awareness among medical practitioners regarding the association between periodontal disease and systemic disease, a cross-sectional study was carried out in one of the southern states in India. Convenient sample of 120 medical practitioners was decided. Data was collected using a questionnaire by visiting various private clinics and hospitals. Ethical clearance was obtained from Institutional Review Board of Saveetha Dental College. A specially designed questionnaire consisting of 15 questions was used to assess the knowledge about the association of periodontal disease and systemic disease. This questionnaire was distributed among medical practitioners and the purpose of the study was explained. It was mentioned that the responses would remain confidential. The filled

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**Table 1:** Distribution of the study subjects according to sex and number of years of experience

Experience	Male (number, %)	Female (number, %)	Total (number, %)
<10 years	26 (41.2)	37 (58.7)	63 (52.5)
10–20 years	35 (74.4)	12 (25.5)	47 (39.2)
>20 years	7 (70)	3 (30)	10 (8.3)
Total	68 (56.7)	52 (43.3)	120 (100)

questionnaire were immediately collected after answering and analyzed. Inclusion criteria includes the medical practitioners should have registered in Indian Medical Association. Undergraduate medical students and interns were excluded from the study.

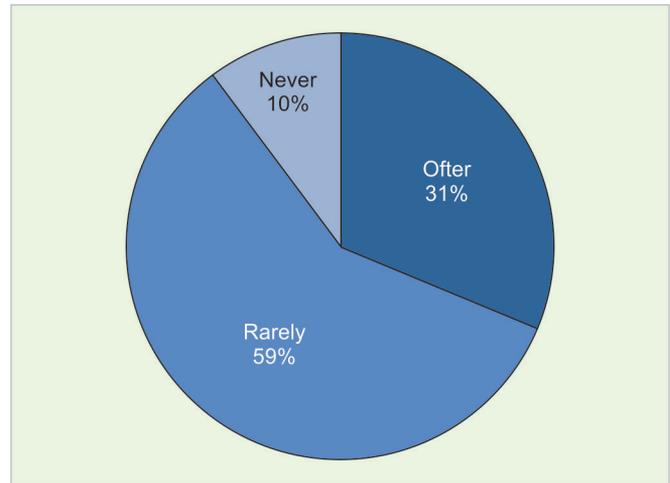
## RESULTS

Table 1 represents the study population based on their years of experience in medical practice; 63 (52.5%) had <10 years of experience, 47 (39.2%) had 10 to 20 years of experience, and 10 (8.3%) had >20 years of experience.

Graph 1 shows that among 120 doctors, 37 (31.4%) doctors often refer patients to dentist, 69 (58.5%) refer rarely, and 12 (10.2%) never refer patients to dentist. Out of which 53 (54.1%) doctors mostly refer patients with diabetes mellitus, 6 (6.1%) doctors refer cardiac patients, 3 (3.1%) doctors refer osteoporosis, and 36 (36.7%) doctors refer for other reason with systemic ailment.

Table 2 shows the response of study subjects to questions to assess knowledge on association between periodontal disease and systemic disease.

Among the study subjects, 103 (87.3%) were aware about foci of infection theory and 17 (12.7%) were not aware of the theory. Among the subjects, 83 (68.9%) were aware about signs and symptoms of periodontal disease and 37 (31.1%) were not aware about the symptoms. Eighty-eight (73.3%) subjects agreed and were

**Graph 1:** Referral to dentist by medical practitioners

aware that periodontal infection is a risk factor for systemic disease, whereas 32 (26.7%) were not aware that periodontal disease is a risk factor for systemic disease. Among the subjects, 62 (51.7%) were aware that periodontal disease is a risk factor for arteriosclerotic coronary artery disease, whereas 58 (48.3%) were not aware that periodontal disease is a risk factor for arteriosclerotic coronary artery disease. Majority number of subjects, 99 (83.2%), are aware that diabetes mellitus affects periodontal status and 21 (16.8%) are not aware that diabetes mellitus affects periodontal status of the patient. But only 47 (39.2%) were aware and 76 (63.9%) were not aware that treating periodontitis will reduce blood glucose level in diabetic patients. Also, 78 (65%) subjects were aware that pregnancy increases the tendency for gums to swell and bleed, but 42 (35%) were not aware. Among the subjects, 43 (36.1%) were aware that periodontal disease could affect outcomes of pregnancy, and 76 (63.9%) were not aware that periodontal disease could affect pregnancy

**Table 2:** Responses of study subjects to questions to assess knowledge on association between periodontal disease and systemic disease

Questions to assess knowledge	Responses	
	Yes (number, %)	No (number, %)
Do you know about foci of infection?	103 (87.3)	17 (12.7)
Do you know the signs and symptoms of periodontal disease?	83 (68.9)	37 (31.1)
Is periodontal infection a risk factor for systemic disease/condition?	88 (73.3)	32 (26.7)
Are patients with periodontal disease are at higher risk for arteriosclerotic coronary artery disease than patients with healthy periodontium?	62 (51.7)	58 (48.3)
Does diabetes mellitus affect periodontal status of a patient?	99 (83.2)	21 (16.8)
Do you think treating periodontitis will reduce blood glucose level in diabetic mellitus patients?	47 (39.2)	73 (60.8)
Do you think pregnancy increases the tendency for the gums to bleed, swell, or be red?	78 (65)	42 (35)
Do you think gum problems could affect outcomes of pregnancy?	43 (36.1)	76 (63.9)
Does periodontal infection aggravate bacterial pneumonia and COPD?	51 (42.9)	68 (57.1)
Does periodontitis increases the risk for rheumatoid arthritis?	40 (33.6)	79 (57.1)
Does metabolic syndrome have an association with periodontitis?	44 (36.7)	79 (63.3)
Does antihypertensive drugs cause gingival enlargement?	64 (53.3)	56 (46.7)
Can periodontitis be treated only with antibiotics?	33 (22.5)	87 (77.5)

outcomes. Fifty-one (42.9%) subjects were aware that periodontal infection aggravates bacterial pneumonia and chronic obstructive pulmonary disease (COPD), 68 (57.1%) subjects were not aware. Less awareness of 40 (33.6%) was seen on association of rheumatoid arthritis and periodontitis. Awareness about association of metabolic syndrome and periodontitis was also found low 44 (36.7%). Among the subjects 64 (53.3%) were aware that antihypertensive drugs causes gingival enlargement whereas 56 (46.7%) were not aware that antihypertensive drugs cause gingival enlargement. Majority number of subjects, 87 (77.5%) were aware that periodontitis cannot be treated only with antibiotics, 33 (22.5%) were not aware that periodontitis cannot be treated only with antibiotics.

## DISCUSSION

William Osler stated that mouth is the mirror of general health. Periodontal disease is a complex infectious disease resulting from interplay of bacterial infections and host response to bacterial challenges. There are about 500 different bacterial species which are capable of colonizing the mouth of an adult human.<sup>6</sup> In 1890, Miller attributed a set of oral diseases to infections. Distant injury is key principle for focal infection theory. Focal infection theory explains that a localized infection, often asymptomatic, can disseminate microorganisms or their toxins to distant sites within one's own body and thereby initiate disease.<sup>7</sup> Vascular dissemination of bacterial products, such as LPS occurs through sulcular epithelium leading to systemic disorders. Poor oral health maintenance may affect the general health. This cross-sectional study was conducted to assess the knowledge of medical practitioners on periodontal disease association with systemic disease. Medical doctors are considered an opportune site to reach large number of patients than dentists. Physicians can provide screening services and provide advice to seek dental care.

A study by Allen et al<sup>8</sup> reported that the attention to patients with diabetes about periodontal disease is low compared to attention to their increased danger for coronary illness, eye malady, kidney ailment, and circulatory issues. Whether medical practitioners are applying the knowledge about the relation between diabetes mellitus and periodontal disease in their practice relies on the level of their awareness of such important information.

In this study, awareness about association of periodontal disease and diabetes (83.2%) was more compared to study done by Al-Khabbaz et al<sup>9</sup> (75%). Awareness about pregnancy association with bleeding gums in this study (65%) is more when compared to study done by Tarannum and Faizuddin<sup>10</sup> which is 44%, but Tarannum and Faizuddin study was conducted among

general female population. In the study done by Al-Habashneh et al<sup>11</sup> which is 81%, this study was done among medical practitioners. Awareness on periodontal disease affecting pregnancy outcomes was 36.1% which is less when compared with study done by Tarannum and Faizuddin<sup>10</sup> which is 54%.

The total surface area of pocket epithelium in contact with subgingival bacteria and their products in a patient with generalized moderate periodontitis is estimated to be the size of an adult hand and with even larger areas of exposure in case of more advanced periodontal destruction.<sup>12</sup> An infection of this size on a pregnant woman or a diabetic patient would be of concern for the patient and his/her doctor. Periodontal infection should also be viewed in similar manner.

Evidence supports a causal association between periodontal infection and atherosclerotic cardiovascular disease or its sequelae. Studies have shown that periodontitis results in higher systemic levels of C-reactive protein, interleukin (IL)-6, and neutrophils.<sup>13</sup> These elevated inflammatory factors may increase inflammatory activity in atherosclerotic lesions, potentially increasing the risk for cardiovascular events.<sup>14</sup> Scannapieco and Ho<sup>15</sup> in their study proved that lung function decreased with increasing periodontal attachment loss and that there is almost five-fold increase in chronic respiratory diseases in subjects with poor oral hygiene when compared with good oral hygiene. Therefore, they concluded that a potential association between periodontitis and chronic pulmonary diseases like COPD exist.<sup>16</sup>

## LIMITATIONS

This study was carried out in one area only; hence the finding may not be applicable on the national scale. This may have led into some bias, therefore a similar study on a larger scale is required to give more representative findings.

## CONCLUSION

Although the vast majority of the medical doctors reported that they knew the relationship between periodontal disease and systemic health, this awareness was not supported by precise knowledge and failed to appropriate clinical practice. Professional attention should be given to the importance of the relationship between oral health and systemic health. It is important for primary medical care professionals to understand the relationship between periodontal disease and systemic disease to give appropriate assessment, prevention, and management of health needs of the patient. This awareness can be increased by conducting educational programs and establishing an integrated practice structure for

managing all aspects of systemic disease along with periodontal disease management and the exchange of knowledge between dental and medical practitioners.

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