

Heart failure and oral bacteria: How could be prevented?

Sir,

It has to be said that more than 400 bacterial species are localized in the subgingival plaque.^[1,2] Very common bacteria species—*Actinobacillus actinomycetemcomitans*, *Fusobacterium nucleatum*, *Tannerella forsythensis* (*Bacteroides forsythus*), *Porphyromonas gingivalis*, *Prevotella intermedia*, and spirochetes have also been identified from symptomatic-infected implants.^[3,4] Bacterial infection is the main reason of heart failure.^[5] Nowadays different studies have shown that different bacteria are present in the pocket of patient with heart diseases,^[6] different factors may have a role in implementation of heart diseases including oral infection^[7] and systemic diseases.^[8,9] It is supposed that specific oral organisms may have a role for heart failure.^[10] Perhaps the role of many oral bacteria is also not clear in heart failure, and the mechanisms of this relationship are not completely known.^[11] Possibly specific organism may be involved in different heart failure, but many more studies are necessary to clear the fact. Good oral hygiene could be more effective against heart diseases, in particular, in people who had a history of heart diseases among their family or previous heart attacks. It seems oral health is the key before and after heart diseases in patients, and it should not be forgotten by patients.

Ali M. Tavana

*Health Research Center, Baqiyatallah (a.s), University of
Medical Sciences, Tehran, Iran*

Address for correspondence:

*Dr. Ali M. Tavana, Health Research Center,
Baqiyatallah (a.s),
University of Medical Sciences,
Tehran, Iran.*

E-mail: alimehrabitavana@yahoo.com

DOI: 10.4103/0975-3583.70924

REFERENCES

1. Becker W, Becker BE, Newman MG, Nyman S. Clinical and microbiologic findings that may contribute to dental implant failure. *Int J Oral Maxillofac Implants* 1990;5:31-8.
2. Piovano S. Bacteriology of most frequent oral anaerobic infections. *Anaerobe* 1999;5:221-7.
3. Mättö J, Asikainen S, Väisänen ML, Rautio M, Saarela M, Summanen P, *et al.* Role of *Porphyromonas gingivalis*, *Prevotella intermedia*, and *Prevotella*

nigrescens in extra oral and some odontogenic infections. *Clin Infect Dis* 1997;2:194-8.

4. Tavana AM, Korachi M, Boote V, Hull PS, Love DN, Drucker DB. Phospholipids analogues of *Porphyromonas gingivalis*. *J Appl Microbiol* 2000;88:791-9.
5. Nakano K, Nomura R, Matsumoto M, Ooshima T. Roles of oral bacteria in cardiovascular diseases - from molecular mechanisms to clinical cases: Cell-surface structures of novel serotype k streptococcus mutans strains and their correlation to virulence. *J Pharmacol Sci* 2010;113:120-5.
6. Bochniak M, Sadlak-Nowicka J, Kedzia A, Sobiczewski W. Bacteriological spectrum of periodontal pocket in patients with coronary heart disease and myocardial infarction. *Przegl Lek* 2009;66:373-9.
7. Habib G. Infective endocarditis: What's new? European Society of Cardiology (ESC) guidelines 2009 on the prevention, diagnosis and treatment of infective endocarditis. *Presse Med* 2010;39:704-9.
8. Mitrović-Perišić N, Antić S. Risk factors for coronary heart disease and actual diagnostic criteria for diabetes mellitus. *Vojnosanit Pregl* 2009;66:973-8.
9. Seymour GJ, Ford PJ, Cullinan MP, Leishman S, Yamazaki K. Relationship between periodontal infections and systemic disease. *Clin Microbiol Infect* 2007;13:3-10.
10. Herzberg MC, Nobbs A, Tao L, Kilic A, Beckman E, Khammanivong A, *et al.* Oral streptococci and cardiovascular disease: Searching for the platelet aggregation-associated protein gene and mechanisms of *Streptococcus sanguis*-induced thrombosis. *J Periodontol* 2005;76:2101-5.
11. Tavana AM. Isolation of *P. corporis* from oral cavity: What is the role of this bacterium in the mouth and other parts of the human body? *Indian J Dent Res* 2009;20:129.

Periodontal disease linked to cardiovascular disease

Sir,

Periodontitis is a destructive inflammatory disease of the supporting tissues of the teeth and is caused either by specific microorganisms or by a group of specific microorganisms, resulting in progressive destruction of periodontal ligament and alveolar bone with periodontal pocket formation, gingival recession, or both.^[1] Periodontitis has been proposed as having an etiological or modulating role in cardiovascular and cerebrovascular disease, diabetes, respiratory disease, and adverse pregnancy outcome, and several mechanisms have been proposed to explain or support such theories and oral lesions are indicators of disease progression and oral cavity can be a window to overall health and body systems. One of these mechanisms is based on the potential effects of the inflammatory phenomenon of periodontitis on the systemic dissemination of the locally produced mediators such as C-reactive protein (CRP), interleukins-1 beta (IL-1 β) and -6 (IL-6), and tumor necrosis factor-alpha (TNF- α).^[2] Periodontitis creates a

burden of bacterial pathogens, antigens, endotoxins, and inflammatory cytokines that contribute to the process of atherogenesis and thromboembolic events. Of all the aspects of periodontitis, the role of bacterial pathogen is more contributing in terms of contributing factor for cardiovascular diseases. In response to infection and inflammation, certain persons may exhibit greater expression of local and systemic mediators and may thereby be at increased risk for atherosclerosis. The atherosclerosis process may result in decreased arterial patency and/or decreased compliance of the vessel. Ultimately, atherosclerotic lesions may fissure and/or rupture, resulting in occlusion of the vessel lumen, precipitating a myocardial infarction or stroke. The difficulty in drawing a cause and effect relationship between periodontitis and cardiovascular disease stems from the fact that the two groups of diseases share many risk factors. Risk factors, such as smoking, genetics, stress, and increasing age, could independently lead to periodontal disease and to cardiovascular disease in a group of patients, possibly leading to the incorrect assumption that the two diseases are linked. Three notable mediators that lead to tissue destruction and disease are IL-1, TNF- α , and MMPs. Both IL-1 and TNF- α are proinflammatory cytokines and are produced by several cell types with a diverse array of activities. Studies have demonstrated that they are involved with inflammation and connective tissue breakdown and can limit repair of periodontium and myocardium. Specifically, their role in inflammation includes the stimulation of adhesion molecule and chemokine expression, and production of other inflammatory mediators such as prostaglandin E₂. The chronicity of periodontal disease provides a

rich source of subgingival microbial and host response products and effects over a long-time period. Two main processes may provide a causative link between these two diseases: the lipopolysaccharide and monocyte-related responses.^[3] Thus, it can be concluded that relationship between oral disease (specifically periodontitis) and atherosclerosis/coronary heart disease exists and indicates that periodontitis plays a considerable role in the pathogenesis of atheroma formation, as well as in cardiovascular events.

**Rajiv Saini, Santosh Saini¹,
Sugandha Sharma²**

*Departments of Periodontology and Oral Implantology,
²Prosthodontics, Rural Dental College,
¹Department of Microbiology,
Rural Medical College, Loni,
Maharashtra, India*

Address for correspondence:

*Dr. Rajiv Saini, Department of Periodontology
and Oral Implantology, Rural Dental College,
Loni, Tehsil-Rahata, Ahmednagar District,
Maharashtra – 413 736, India.
E-mail: drperiodontist@yahoo.co.in*

DOI: 10.4103/0975-3583.70925

REFERENCES

1. Saini R, Marawar PP, Shete S, Saini S. Periodontitis a true infection. *J Glob Infect Dis* 2009;1:149-51.
2. Saini R, Saini S, Saini SR. Periodontal diseases: A risk factor to cardiovascular diseases. *Ann Card Anaesth* 2010;13:159-61.
3. Kinane DF, Lowe G. How periodontal disease may contribute to cardiovascular disease. *Periodontol* 2000 2000;23:121-6.

