

Editorial

Periodontal Disease – Multiple Factors at Play

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When pathogenesis of periodontal disease is taught in classroom to dental students, two basic concepts are conveyed: 1) the primary factor in the initiation of most periodontal diseases is biofilm (structured bacteria or dental plaque); 2) periodontal tissue destruction in periodontal disease such as breakdown of periodontal ligament fibers and resorption of the alveolar bone is caused predominantly by the exaggerated host immune-inflammatory responses to bacterial challenges. More often than not, the dental students in the classroom raise the question, “What, then, is the ultimate cause of periodontal disease?” Hopefully, the students will get the take-home message: there are multiple factors at play in the pathogenesis of periodontal disease and the disease is largely preventable. The same message should be conveyed to patients in our clinics and to the public.

Periodontal disease is a complex clinical entity. There are multiple diseases and conditions affecting the periodontium, as classified at the 1999 International Workshop for the classification of the periodontal diseases. The most common forms of the periodontal diseases, however, are plaque-induced gingivitis and chronic periodontitis. According to the Centers for Disease Control and Prevention (CDC)’s 2009-2010 National Health and Nutrition Survey, 47.2 percent of American adults (age of 30 and older) have periodontitis, and the prevalence rate increases as people age. The prevalence of plaque-induced gingivitis, relative to that of periodontitis, is difficult to assess, due to the greater inter-study variations in measurement of gingival inflammation. However, there is general consensus that the prevalence of gingivitis is higher than that of periodontitis in cross-sectional studies.

Both gingivitis and periodontitis are inflammatory in nature and initiated by oral bacteria. It is consensus opinion that inadequate oral hygiene will result in accumulation of dental plaque and the subsequent gingival inflammation - a clinical condition diagnosed as plaque-induced gingivitis. Although individuals may have different levels of host response towards the bacterial challenge, it is well-documented that good oral hygiene and routine dental prophylaxis prevent and/or reduce gingival inflammation. Since plaque-induced gingivitis is generally considered to precede chronic periodontitis, oral hygiene and preventive dental care are the two most important procedures for maintaining periodontal health.

Chronic periodontitis exhibits, in addition to gingival inflammation, periodontal tissue destructions such as alveolar

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bone loss and periodontal ligament breakdown that are irreversible if not intervened upon by professional treatment. Periodontitis has been studied extensively and has been recognized by the public as an important clinical entity, since it has been demonstrated that periodontal disease is associated with systemic conditions such as cardiovascular diseases, respiratory diseases, and pre-term birth.

There are multiple factors that may increase the risk of development of periodontitis. Among them, tobacco smoking and diabetes are well-established, since the prevalence and severity of periodontitis are higher in patients with smoking habit or with diabetes mellitus, relative to those without the conditions. The response to periodontal therapy is also negatively impacted by these two factors. Many other conditions may pose an increased risk for periodontitis, such as local factors (calculus, tooth anatomy, and restoration) that promote biofilm retention, increased pathogenic Gram-negative bacteria, genetic differences, immune alteration, and stress. While aging, male gender, and lower socioeconomic status are associated with increased prevalence and severity of periodontitis, they may not be independent factors for the disease. Epidemic studies have demonstrated that male gender and lower socioeconomic status do not cause increased risk for periodontitis after adjusting for other factors listed above. The association of periodontitis and aging may be attributed to a cumulative effect as a result of prolonged exposure to periodic perturbation of the homeostasis between oral microbiota and the host immune-inflammatory responses.

We, as health care professionals, should raise public awareness that periodontal disease is associated with multiple factors and is largely preventable. Since oral biofilm is the primary etiological factor in the initiation of the disease, everyday plaque-control measures to maintain good oral hygiene should be promoted at every opportunity. American Dental Association recommends brushing and flossing at least twice and once daily, respectively. Other plaque-control materials such as mouth rinse can also be helpful as adjunct for oral hygiene.

Professional dental prophylaxis twice a year for periodontal healthy individuals and periodontal maintenance every 3 months for post-treatment patients with periodontitis are accepted procedures (both by the public and insurance companies) in

the United States. These procedures are not only essential for prevention and/or treatment of periodontal disease (and other oral diseases such as dental caries), but provide also another opportunity to reinforce oral hygiene.

Although there are many factors associated with the risk for periodontitis, the majority of them can be modified, with perhaps the exception of genetics. For example, it has been demonstrated that tobacco cessation in periodontitis patients will result in similar treatment response relative to never smokers. It is also

demonstrated that controlling diabetes has a positive effect on the periodontal status of patients with periodontitis. In addition, the host can be modulated to alter immune-inflammatory responses to bacterial challenges.

In summary, periodontal disease is a preventable condition. By living a healthy lifestyle and modification of the factors associated with the disease, we can maintain periodontal health and also oral health.

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