Periodontal disease and systemic health: Has the puzzle been completed?

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Oral diseases were once believed to be the cause of almost every inflammation in the body. At that time the treatment regimens of systemic disease consisted of treating or most of the time extracting the teeth.

Then for a period of time the truth that the mouth is connected to the rest of the body was ignored. At the end of last century focal infection theory again put the attentions to the oral-systemic disease relations explaining that the infection in one part of the body could affect the other organs.

In the past two decades extraordinary progress has been made in understanding the relationship between periodontal diseases and systemic health. The studies are basically focused on identifying the mechanisms and whether treating periodontal disease could have a positive impact on systemic conditions. The associations are often accepted to be bidirectional and diabetes mellitus-periodontal disease is a good example of this complex issue.

Microbial dental plaque is the primary etiological factor of periodontal disease but the form and the progression of the diseases are all dependent on the host defenses. One explanation for the systemic factors modifying the forms of periodontitis is through their effects on the immune and inflammatory defenses and the other explanation is that the periodontium may serve as a reservoir of bacteria and may increase the risk for certain infections.

The main problem now for the researches is to testify if these diseases are linked because they have risk factors in common or a true causal relationship exists. For now the results of many researches indicate that periodontal infections may have an impact on pregnancy, diabetes mellitus and cardiovascular disease. Also pulmonary disease may be associated with periodontal disease.

Pregnancy

The findings in the literature suggest that the hormonal changes during puberty, pregnancy and menopause may impact periodontal tissues by altering the host response. Periodontal disease is related to increased inflammatory mediators and prostaglandins and some of these molecules such as prostaglandin E2 (PGE2) are known to influence preterm delivery, so it is possible to hypothesize that pregnant women with periodontal disease may experience more preterm deliveries. Maternal infections and inflammation elsewhere may play a role in this cases (see Figure 1). Until these facts are accepted as a true causal relationship women should maintain good periodontal health during espacially pregnancy.
**Diabetes Mellitus**

Diabetes mellitus is the most common of all metabolic disorders that is caused either by hypoproduction of insulin or improper use of available insulin that leads to high blood glucose levels.

Periodontal disease is now called the sixth complication of diabetes along with retinopathy, nephropathy, neuropathy, macrovascular disease and poor wound healing and diabetes is accepted as a modifying factor for periodontal disease. There are certain biological mechanisms that explain diabetes-periodontal tissues relationship. They are microangiopathy, genetic factors, alterations in gingival crevicular fluid, collagen metabolism, host inflammatory response, and the changes in the subgingival flora. Periodontal infection may also adversely affect glycemic control. These results suggest that periodontal antimicrobial treatment may reduce the level of glycated hemoglobin in diabetic patients and reduce diabetic sequelae. However, there is still a need for further researches to reach final conclusion.

**Cardiovascular disease**

Cardiovascular disease is the leading cause of death in many societies. However, up to 50 per cent of patients with cardiovascular disease have none of the traditional risk factors. Individuals with severe chronic periodontitis have been reported to have an increased risk of developing cardiovascular disease after adjusting for many of the traditional risk factors, such as age, gender, diabetes, smoking and family history.

As it is now accepted that infection and inflammation play an important role in the initiation and progression of atherosclerosis one can assume that there could be a role for oral infections (see Figure 2).

Cardiovascular disease and periodontal disease have a number of characteristics in common. Both diseases are more likely to occur in older male people, who smoke and are hypertensive and stressed. These commonalities suggest that periodontal disease and heart disease may also share a similar causative pathway.
Respiratory disease
Since the oral cavity is contiguous with the trachea, it is an important reservoir for the respiratory pathogens. Such pathogens can be aspirated into the lower respiratory tract increasing the risk of respiratory infections so it could be hypothesized that periodontal therapy may reduce these pathogens colonised on the surface of the teeth and oral tissues. As oral health is a part of general health, a greater integration of medicine and dentistry should be encouraged. Periodontal disease is a chronic infection that produces a local and systemic host response as well as a source of bacteriemia, so the prevention and treatment of periodontal disease may reduce chronic systemic disease risk. If further research confirm that periodontal disease is a true risk factor for systemic disease a new horizon will appear in the future of dentistry.

REFERENCES