

## **PERIODONTAL ASSOCIATION WITH SYSTEMIC DISEASE**

(From Dentistry Today September 2006. Authors: Neil Gottehrer, DDS, Steven E. Berglund, DMD)

Periodontitis has been identified as an important emerging RISK FACTOR for a number of major medical diseases, including cardiovascular disease, stroke, and type 2 diabetes, as well as for pre-term, low-birth weight infants <sup>1-2</sup>.

Patients with severe periodontitis have been shown to be twice as likely to have a fatal heart attack and 3 times as likely to have a stroke compared to patients without periodontal disease, after adjusting for known, cardiovascular risk factors<sup>3-4</sup>, including blood lipids, cholesterol, body mass, diabetes, and smoking.

Gingivitis and periodontitis therefore can no longer be considered exclusively dental diseases or a localized infection, since they can now be associated with this other systemic diseases.

Periodontal disease is now characterized by systemic inflammatory host responses that contribute to an elevation of C-reactive protein (CRP), a predictor of increased risk for cardiovascular disease <sup>5</sup>. A clinical study by Genco, et al <sup>6</sup> showed that treatment of periodontal disease caused a 65% reduction in the levels of CRP at 3 months, which remained reduced for 6 months. This suggests that periodontal disease induces CRP and possibly other inflammatory mediators, which are known to be independent risk factors for heart disease. They postulated that periodontal disease results in bacteremias and stimulates production of factors such as TNF-alpha and IL-6, which likely stimulate the liver to make CRP.

Periodontal disease, until now, has been considered exclusively an oral infectious disease, with its primary effects limited to the mouth and the periodontium. Physicians have not considered it in their physical exams or considered it, in evaluating their patient's cardiac condition. Based in this information, gingivitis and periodontitis should be considered for diagnosis and management of coronary heart disease if the physician wants to reduce the risk of heart attack or stroke.

## **DIABETES AND PERIODONTAL DISEASE**

Periodontal disease has also been identified as being a complication of diabetes mellitus.<sup>7</sup> It has been reported for many years that patients with diabetes mellitus have an increased susceptibility to periodontitis.<sup>8</sup> Emrich, et al<sup>9</sup> studied the Pima Indians residing Arizona, who have the world's highest prevalence to type 2 diabetes. In this population, the onset of alveolar bone and periodontal attachment loss was early, and the rate of advance was almost three times that of the nondiabetic patient. Proposed mechanisms for this association include the impaired neutrophil function found in patients with diabetes, alterations in collagen synthesis, and increased production of collagenase, which degrades the

collagen that makes up 90% of the organic matrix of bone. Bone formation has been shown to be suppressed, resulting in loss of alveolar bone.

However, it was also found in this population that the relationship between diabetes and periodontal disease is bidirectional. Periodontal disease can also exacerbate the diabetic condition. It has been demonstrated that diabetic patients with periodontal disease are more likely to have poor glycemic control than patients without periodontal disease.

We may presume, then, that appropriate, conservative periodontal care, supplemented with antimicrobial and host enzyme suppression management, will provide significant improvement in the patient's prognosis for any number of major diseases they previously had been diagnosed with.

Knowing the possible adverse effect of periodontitis/gingivitis on physical health, the patient population will want to have an early diagnosis made for their condition, with the necessary treatment provided, so they can remain healthy.

### **References:**

- 1.- Offenbacher S. Periodontal Diseases: pathogenesis. *Ann of Periodontol* . 1996; 1:821-878
- 2.-Page RC: The pathology of periodontal diseases may affect systemic diseases: inversion of a paradigm. *Ann Periodontol*. 1998;3:108-120
- 3.- Beck JD Garcia R, Heiss G, et al. Periodontal disease and cardiovascular disease. *J Periodontol*. 1996; 67 (Suppl):1123-1127
- 4.- Beck JD, Offenbacher S, Williams R, et al. Periodontitis: a risk factor for coronary heart disease? *Ann Periodontol*. 1998;3:127-141
- 5.- Noack B, Genco RJ, Trevisan M, et al. Periodontal infections contribute to elevated systemic rweactive C-protein level. *J Periodontol*. 2001;72:1221-1227
- 6.- Genco RJ, Glurich I, Haraszthy V, et al. Overview of risk factors for periodontal disease and implications for diabetes and cardiovascular disease. *Compend Contin Educ Dent*. 1999; 19(suppl1): 40-45
- 7.- Loe H. Periodontal Disease. The sixth complicationj of diabetes mellitus. *Diabetes Care*. 1993; 16:329-334
- 8.- Belting CM, Hiniker JJ, Dummett CO. Influence of Diabetes Mellitus on the severity of periodontal disease. *J Periodontol* 1964;35:"476-480
- 9.- Emrich J, Shlossman M, Genco RJ. Periodontal disease in non-insulin-dependent diabetes mellitus, *J Periodontol*. 1991; 62: 123-131