

White Papers

New Research and Commentary on the Oral-Systemic Relationship*



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Periodontal Disease and Coronary Heart Disease

Karen Geismar, Kaj Stoltze, Bjarne Sigurd, Finn Gyntelberg, Palle Holmstrup

Abstract

Background — Several epidemiological studies have demonstrated an association between periodontal disease and coronary heart disease (CHD). The association could be a result of confounding by mutual risk factors. The present study was undertaken in a Danish population to reveal the significance of common risk factors.

Methods — The investigation was conducted as a case-control study comprising 250 individuals: 110 individuals with verified CHD from a Department of Cardiovascular Medicine and 140 control individuals without CHD from the Copenhagen City Heart Study. Information on diabetic status, smoking habits, alcohol consumption, physical activity, school attendance, household income, body weight and height, triglyceride, and serum cholesterol was obtained. Full-mouth probing depth (PD), clinical attachment loss (CAL), bleeding on probing (BOP), and alveolar bone level (ABL) on radiographs were registered. ABL was stratified into ABL1 = ABL ≤ 2 mm; ABL2 = ABL > 2 to ≤ 4 mm; and ABL3 = ABL > 4 mm. Multiple logistic regression models with stepwise backward elimination were used allowing variables with $P < 0.15$ to enter the multivariate analysis.

Results — The CHD group had a significantly lower outcome with respect to PD, BOP, CAL, and ABL. For participants < 60 years old, only risk factors such as smoking and diabetic status entered the multivariate analysis. For the ABL3 group, there was a significant association with CHD for participants < 60 years old, the odds ratio being 6.6 (1.69 to 25.6). For participants ≥ 60 years old, there was no association.

Conclusions — The present study showed a positive association between periodontal disease and CHD in agreement with several other studies. The association was highly age dependent and could only be attributed to diabetes and smoking to some extent.

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*Most published research to date shows that there is a possible association between periodontitis and systemic health. A causal relationship between the two has not yet been clearly established.

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periodontal indices or partial determination of periodontal disease status. The aim of the study was to determine if recently-diagnosed CHD patients have a higher prevalence of periodontal disease compared to healthy community-based controls, and if so, whether the difference could be explained entirely by risk factors that are common to both diseases.

... patients less than 60 years of age displaying severe bone loss were 6.6 times more likely to demonstrate CHD than the control subjects.

The authors found that CHD patients had significantly fewer teeth and higher levels of all periodontal disease measures (pocket depth, clinical attachment and alveolar bone levels) than controls. Many lifestyle characteristics and CHD markers were related to both diseases. For patients less than 60 years of age, diabetes and tobacco use explained much of the relationship between periodontal disease and CHD. However, even after controlling for these factors, the association remained strong in this age group. In fact, the authors found that patients less than 60 years of age displaying severe bone loss were 6.6 times more likely to demonstrate CHD than the control subjects.

What does *this article* teach us?

There has been mounting evidence over the past decade that has suggested an association between periodontal disease and cardiovascular risk, and the findings of this study add to the growing number of those investigations supporting this notion.

The article describes a cross-sectional, epidemiological study that evaluates the relationship between periodontal disease and coronary heart disease (CHD) in 250 Danish subjects. The study population was primarily men who either had been diagnosed with coronary heart disease or were without coronary heart disease, as confirmed by hospital records. Of interest, this study was the first of its kind in a large patient population to have performed exhaustive (full-mouth) measures of clinical attachment loss and alveolar bone levels to common disease risk factors. Most previous studies examining the periodontal disease-cardiovascular connection have relied on overall

What are the clinical implications of the study?

Coronary heart disease is one of the more common causes of morbidity and mortality worldwide, and is the single leading cause of death in the United States. In 2003, nearly one in five American deaths were due to coronary heart disease, and more than one million new and recurrent coronary attacks were recorded.

... if future prospective studies continue to demonstrate that periodontal disease contributes to CHD independently of common lifestyle and genetic factors, treatment of periodontal disease may be added to the list of important preventive actions.

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Control of high blood pressure and serum lipids, and improvements in dietary quality and physical activity level are some examples of measures one can adopt in order to reduce CHD risk. If future prospective studies continue to demonstrate that periodontal disease contributes to CHD independently of common lifestyle and genetic factors, treatment of periodontal disease may be added to the list of important preventive actions. If, on the other hand, further studies fail to support the causality hypothesis, there may still be useful clinical implications. We know, for example, that periodontal disease and CHD frequently co-occur. Dentists can use that knowledge to probe for risk factors, and if appropriate, recommend interventions that reduce the risk of both diseases.

The authors further suggest that periodontal disease precedes, and may not be simply a factor that follows in parallel to CHD due to other risk factors. As such, physicians should encourage their CHD patients to seek evaluation for periodontal disease.

Currently, the influence of periodontal disease on cardiovascular disease has not been fully defined. This paper, however, has contributed to the two decades of research which has suggested that inflammatory periodontal disease affects the progression and severity of coronary heart disease, most notably in patients under the age of 60.

How should the results of this study impact treatment of my patients?

Although this investigation emphasizes the significant association between periodontal attachment loss and alveolar bone loss with CHD, for now the body of evidence still only signifies an association. Therefore, recommending periodontal treatment at this time, solely for the purpose of preventing coronary heart disease, cannot be advocated.

Yet the benefits of periodontal disease prevention and treatment must be recognized on the basis that there cannot be complete health without good oral health. Effective patient counseling, combined with conscientious at-home mechanical plaque

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removal, can serve as important periodontal disease-preventive initiatives. Using a dentifrice containing triclosan, which offers both long-lasting antibacterial and anti-inflammatory protection, would be an appropriate complement to such a regimen.

This study further highlights the significance of environmental factors and systemic disorders in the development and progression of periodontal disease. In this study, tobacco and diabetes were important common risk factors. Dental professionals can play a key role in educating their patients about smoking prevention and cessation, and in reinforcing the importance of diabetes control.



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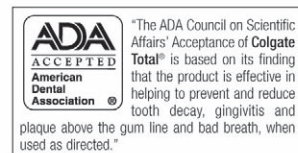
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