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summary

No good evidence for a strong association between dental disease and coronary heart disease

Danesh J. Coronary heart disease, Helicobacter pylori, dental disease, Chlamydia pneumoniae, and cytomegalovirus: meta-analyses of prospective studies. Am Heart J 1999; 138:434–437

Objective To provide a systematic overview of the evidence available from prospective epidemiological studies of coronary heart disease (CHD) and *Helicobacter pylori*, dental disease, *Chlamydia pneumoniae* or cytomegalovirus.

Data sources Computer-assisted searches, scanning of relevant reference lists, hand-searching of cardiology, epidemiology and other relevant journals, and discussions with relevant authors.

Study selection Prospective studies published before 1999 in any language that reported on the correlation between CHD and the presence of *H. pylori*, *C. pneumoniae*, cytomegalovirus or dental infection.

Results Five prospective dental studies were identified involving 2369 cases, a weighted mean age of 55 and a weighted mean follow-up of 12 years. All but one study adjusted for smoking and standard risk factors but only three adjusted for social class. There was no significant heterogeneity between the five. The combined risk ratio for CHD was found to be 1.24 (95%CI, 1.10–1.38).

Conclusions Published prospective studies provide no good evidence to support the existence of strong epidemiological associations between CHD and *H. pylori*, dental disease, *C. pneumoniae* or cytomegalovirus. Because the available evidence is still sparse, further studies are needed.

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Commentary

This meta-analysis by Danesh combines data from prospective studies published before 1999, and evaluates the association between periodontal disease (or missing teeth) or other infections and CHD (primarily heart attacks). Overall, there appears to be little evidence supporting an association between *H. pylori*, periodontal disease, *C. pneumoniae* or cytomegalovirus and CHD.

Interestingly, the author did find a small but significant relative risk of 1.24 between periodontal disease and CHD which, adjusting for certain confounders, implies the following:

- of 1000 people followed for 10 years who do not have periodontal disease, 100 would develop CHD, and,
- of 1000 people followed for 10 years who do have periodontal disease, 124 would develop CHD,

given that the two populations are similar with respect to the adjusted confounders. The higher incidence of CHD found in people who have periodontal disease could be the result of a causal association between the condition and CHD, or could reflect bias from unadjusted confounders. Danesh concludes that inadequate control for social factors could lead to this apparent association, in the absence of a causal relationship. Confirming this, those articles that controlled for important confounders showed no association whereas, conversely, those that did not adequately control for smoking and social class showed an association. There were errors, however, in identifying which factors were adjusted in which studies. In fact, four studies adjusted for social class, whereas only three controlled for smoking. There was also an error in abstracting the risk ratio from one study. If the meta-analysis was repeated using the correct adjusted risk ratio for periodontal disease and CHD, and all studies had adjusted for major confounders, the overall relative risk from the meta-analysis would be close to 1.0.

More prospective studies that adjust for all major confounders (eg, social factors and smoking) are needed to determine scientifically whether there is a relationship between periodontal disease and CHD. This would help to indicate whether, independent of common risk factors, oral health influences the risk of CHD. In terms of clinical practice, the studies to date indicate that there is little evidence supporting a causal relationship between oral health and CHD.

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