DIALYSIS

Periodontitis and cardiovascular mortality in ESRD

The presence of moderate-to-severe periodontal disease is associated with increased cardiovascular mortality among patients on hemodialysis, according to a retrospective cohort study from the US.

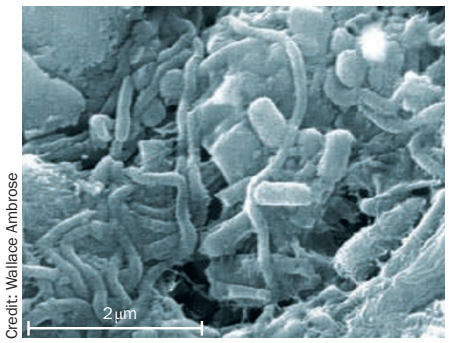
Chronic inflammation is thought to have a role in the onset of cardiovascular disease, the leading cause of mortality among patients with end-stage renal disease (ESRD). Periodontitis, which involves loss of the alveolar bone around the teeth as a result of subgingival bacterial infection, can contribute to systemic inflammation. Abhijit Kshirsagar and colleagues have carried out an observational study of 168 outpatients from four dialysis units to assess the possible association between periodontal disease and cardiovascular mortality in the ESRD population.

Of the 22 deaths that occurred during the 18-month follow-up period, 14 were from cardiovascular causes. After adjustment for co-variables such as age, sex, dialysis center, dialysis vintage, smoking, diabetes mellitus, and hypertension, the risk of cardiovascular mortality was five times greater among the 68 patients with moderate-to-severe periodontitis than among the 100 patients with mild or no disease. The investigators observed no significant association between moderate-to-severe periodontitis and all-cause mortality.

The findings of this study are not proof of a causative role of periodontitis in cardiovascular mortality, and the influence of potential confounders such as socioeconomic status, nutrition, pre-existing cardiovascular disease and access to dental care could not be analyzed. However, the results add to the evidence of a link between periodontitis and cardiovascular disease in other patient populations.

Systemic inflammation is not the only mechanism by which periodontitis could contribute to cardiovascular disease. Periodontal bacteria have been implicated in the formation of atheromatous plaques; in addition, alterations in lipoprotein metabolism and impairment of endothelium-dependent vascular function have been observed in individuals with periodontal disease.

"The next step is to determine the effect of treatment of periodontal disease on cardiovascular mortality and morbidity in the ESRD population," says Kshirsagar. Periodontitis cannot be treated with oral antibiotics, which do not penetrate the subgingival biofilm where Gram-negative anaerobic bacteria, the main cause of the disease, live (Figure 1). Instead, mechanical removal of the biofilm, often in conjunction with subgingival application of a biodegradable antibiotic, is necessary. In the general population, such treatment improves endothelial function, an important surrogate of cardiovascular disease.



Credit: Wallace Ambrose

Figure 1 | Typical morphotypes of periodontal pathogens seen in a micrograph of the subgingival biofilm.

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Original article Kshirsagar, A. V. *et al.* Periodontal disease adversely affects the survival of patients with end-stage renal disease. *Kidney Int.* **75**, 746–751 (2009).