

Exploring the Link Between Gum Disease and Heart Disease

There is a growing body of evidence suggesting a connection between periodontal disease and heart disease. **Lance T. Vernon, D.M.D., M.P.H.**, of the Case School of Dental Medicine, hopes to shed light on this connection. He will follow a cohort of 155 subjects with HIV for two years. His grant is funded by the National Institute of Dental and Craniofacial Research (NIDCR), a branch of NIH. His research subjects are taking a drug regimen termed highly active antiretroviral therapy (HAART), which adds years of life, but may also have side effects that speed up the development of atherosclerosis, or hardening of the arteries. Therefore, following HIV-positive subjects on HAART for two years may yield information that could take a decade to develop in those without the virus.

Dr. Vernon's hypothesis is that, after controlling for known factors, individuals with high levels of periodontal disease will have an accelerated rate of progression towards atherosclerosis—as compared to those with lower levels of gum disease. "Specific bacteria cause gum disease. These bacteria can get into the bloodstream and either attach to walls of distant blood vessels or cause a generalized inflammatory response," says Dr. Vernon. "In either case," he says, "oral bacteria may contribute to changes in the blood vessel which, over time, may contribute to atherosclerosis."

All subjects are tested for the presence of three specific bacteria that are associated with severe periodontal disease. Dental plaque samples are collected, frozen, and analyzed in the laboratory. In addition to looking at oral health parameters, research volunteers are also tested for confounding measures, including their insulin sensitivity, lipid levels, percent body fat, diet, level of exercise, quality of life, and inflammatory markers in their blood. An ultrasound is used to test the functioning of arteries in the arm and the thickness of arteries in the neck. Both measures are very early warning signs for outcomes such as a heart attack or a stroke.

"If we can demonstrate a link between gum disease and cardiovascular disease in this cohort," says Dr. Vernon, "it will further the evidence that oral health is very much connected to general health. It is quite possible that more effective control of periodontal disease may help lower the risk of heart disease, especially in at-risk populations such as those with HIV." In addition to identifying a potential risk factor for heart disease, data from this study may help generate a greater sense of urgency to diagnose gum disease, to treat it more aggressively, and to initiate individualized prevention plans.

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