New study helps explain why a cleaner mouth could mean a healthier heart

June 26 2015, by Tarwinder Rai

Researcher Maria Febbraio identified a cell receptor that helps explain why gum disease is a risk factor for developing heart disease.

New research from the University of Alberta shows that how clean you keep your mouth may affect your chances of developing heart disease.

"A lot of people don't realize oral health impacts the entire body," says Maria Febbraio, foundational science researcher in the U of A's School of Dentistry and author of the new study, published in the scientific journal *PLOS ONE*. Her findings add to existing research showing that patients with untreated periodontal disease are at higher risk of developing cardiovascular disease.

Using preclinical models, Febbraio identified a new receptor on cells, CD36, that interacts with bacteria in the mouth causing periodontal disease. CD36 interacts with toll-like receptors—the immune system's early-warning sentinels against infection—to produce a protein called interleukin-1 beta, or IL1B. The IL1B then increases inflammation, which plays a role in both periodontal disease and atherosclerosis (or hardening of the arteries)—providing a direct link between the two diseases.

"Other studies established the link between periodontal disease and cardiovascular disease and showed that toll-like receptors were involved. But this study recognizes CD36 as an essential co-receptor in the inflammatory response," she says. "Now that we have an idea of the players involved, we can try to direct therapies more specifically to avoid the unwanted side-effects of medication used to treat inflammation. "

Febbraio hopes to further develop the research and ultimately to find a way to treat or stop the progression of heart disease by targeting these receptors.

"We can specifically try to intervene in the interaction between CD36 and toll-like receptors to block the inflammatory response to the bacteria. Our studies identify CD36 as a new potential therapeutic target," says Febbraio.

The head of the School of Dentistry's periodontology division, Liran

Levin, says chronically inflamed gums release bacteria as well as chemicals into the blood that makes periodontal disease a risk factor for cardiovascular disease.

"People who have periodontal disease are found to suffer more from cardiovascular disease. It's a risk factor, like smoking and high blood pressure," he says. "The problem with periodontal disease is you don't feel like you are suffering from it. It doesn't hurt or disturb your daily life until it progresses to the point where your teeth start moving."

Early diagnosis and treatment of periodontal disease is essential in reducing the risk of, and preventing, inflammation and heart disease. Regular dental check-ups and professional cleanings are key when it comes to keeping your mouth healthy, he says.

"Since periodontal disease is more prevalent than what people might perceive, it is highly important to have a check-up appointment with your dentist or a periodontist in order to diagnose and treat early a periodontal condition," he says. "As in many diseases, early diagnosis and treatment are usually much simpler and cheaper than later interventions in a more severe situation."

More information: "CD36/SR-B2-TLR2 Dependent Pathways Enhance Porphyromonas gingivalis Mediated Atherosclerosis in the Ldlr KO Mouse Model." *PLoS ONE* 10(5): e0125126. DOI: 10.1371/journal.pone.0125126

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