

## Health Consequences of Poor Oral Health?

Academics in Finland have explored the role of a bacterium linked with periodontitis in the development of oral and certain other cancers. In a second study, they also found a link between periodontitis and cancer mortality at the population level study. The first study proved the existence of a device at the molecular level through which a bacterium associated with periodontitis, *Treponema denticola*, may also contribute to carcinogenesis. The researchers found that the principal virulence factor of *T. denticola*, chymotrypsin-like proteinase, ensues also in malignant tumors of the gastrointestinal tract, for example, in pancreatic cancer. According to one more study finding, the claim that the enzyme has the ability to activate the enzymes that cancer cells use to invade healthy tissue. At the same time, the proteinase reduced the effectiveness of the immune system by, for example, inactivating molecules known as enzyme inhibitors. In the second study, it was proved that periodontitis is clearly associated with cancer mortality at the population level. An especially strong link to mortality due to pancreatic cancer was found. Some 70,000 Finns took part in the 10-year follow-up study. These studies have demonstrated for the first time that the virulence factors of the central pathogenic bacteria underlying gum disease are able to spread from the mouth to other parts of the body, most likely in conjunction with the bacteria, and take part in central mechanisms of tissue destruction related to cancer, presumed by Prof. Timo Sorsa of the University of Helsinki.

The scholars concluded that low-grade systemic inflammation related to periodontitis facilitates the spread of oral bacteria and their virulence factors to other parts of the body. They pointed out that the prevention and early diagnosis of periodontitis are very important, both for patients' oral health and their overall well-being. As in the long run, this is extremely costly and effective for the society.

The studies were conducted by research groups led by Sorsa, Prof. Caj Haglund, Dr. Jari Haukka, and Dr. Jaana Hagström of the University of Helsinki. The first study, titled "*T. denticola* chymotrypsin-like proteinase may contribute to orodigestive carcinogenesis through immunomodulation," was published online on November 16, 2017, in the British Journal of Cancer. The second study, titled "Periodontitis and cancer mortality: Register-based cohort study of 68 273 adults in 10-year follow-up," was published online on January 11, 2018, in the International Journal of Cancer. Further studies are already ongoing at both the University of Helsinki and Karolinska Institute. It is clear that spirochetes are the cause of many diseases: heart disease, Alzheimer, multiple sclerosis, and intestinal cancer (in all pathohistology spirochetes can be found). Ten



years ago, the research they conducted specially on bad breath and halitosis confirmed that the deeper the dental pocket, the more spirochetes could be found.

The microorganisms responsible for periodontitis also seems to play a role in the commencement of pancreatic cancer as claimed by the researchers at the University of Helsinki, Helsinki University Hospital as well as Karolinska Institute, Sweden.

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