

Alzheimer's and oral health

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Alzheimer's might be lurking in gum disease. Research at the University of Louisville has discovered *Porphyromonas gingivalis*, a key factor in chronic periodontitis or gum disease. It was identified in the brain of Alzheimer's disease patients.

In separate experiments with mice, researchers found that oral infection caused by *Porphyromonas gingivalis* led to brain colonization by the bacteria and an increased production of amyloid beta ($A\beta$), the sticky proteins linked with Alzheimer's.

"Now, for the first time, we have solid evidence connecting the intracellular, Gram-negative pathogen, *P. gingivalis* and Alzheimer's pathogenesis," said Stephen Dominy of the University of Louisville, the study's first author. Pathogenesis is the process by which diseases develop.

"Infectious agents have been implicated in the development and progression of Alzheimer's disease before, but the evidence of causation hasn't been convincing."

The study also identified the toxic enzymes called gingipains secreted by the bacteria in the brains of Alzheimer's patient.

The toxic gingipains were found as well in the brains of deceased people who were never diagnosed with Alzheimer's. It suggests they might have developed the condition if they had lived longer.

The study, published in *Science Advances*, was led by Dominy of Cortexyme, a clinical stage pharmaceutical company based in San Francisco that is developing therapeutics based on data supporting a new theory of the cause of Alzheimer's and other degenerative disorders.

P. gingivalis is mainly found during gingival and periodontal infections; however, it can also be found at low levels in 25 percent of healthy individuals with no oral disease. Transient bacteremia of *P. gingivalis* can occur during common activities such as brushing, flossing and chewing, as well as during dental procedures.

The study offers evidence that *P. gingivalis* and gingipains in the brain play a central role in the pathogenesis of Alzheimer's, providing a new conceptual framework for the treatment of the disease.

The study has designed an oral medication currently being tested in human clinical studies for Alzheimer's.

According to the Mayo Clinic, Alzheimer's disease is the most common cause of dementia. Of the more than 55 million people in the world with dementia, up to seven in 10 are estimated to have Alzheimer's disease.

Early symptoms of Alzheimer's disease include forgetting recent events or conversations. Over time, Alzheimer's disease leads to serious memory loss and affects a person's ability to do everyday tasks.

Medicines may improve symptoms or slow the decline in thinking but there is no cure for Alzheimer's disease, according to the Mayo Clinic. In advanced stages, loss of brain function can cause dehydration, poor nutrition or infection. These complications can result in death. According to the Mayo Clinic, memory loss is the key symptom of Alzheimer's disease. "Early in the disease, people may have trouble remembering recent events or conversations. Over time, memory gets worse and other symptoms occur. At first, someone with the disease may be aware of having trouble remembering things and thinking clearly. As signs and symptoms get worse, a family member or friend may be more likely to notice the issues."

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