Periodontal Disease and Alzheimer’s Disease

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Research Question

Are Alzheimer’s patients with periodontal disease at an increased risk of cognitive decline compared to those with a healthy periodontium?

Abstract

There is a direct correlation between patients with periodontal disease and negative cognitive decline or Alzheimer’s disease. Research has proven that those who suffer from Alzheimer’s/dementia have a reduced dentition which negatively impacts masticatory function. With impaired masticatory function, it leads to poor nutrition which has a direct effect on cerebral stimulation and blood flow which worsens the effects of Alzheimer’s. The bacteria that is present during periodontitis, causes a spike in inflammatory cytokines. These cytokines invade the brain and trigger CNS inflammation which leads to cognitive decline.

Introduction

• Alzheimer’s disease is a brain disorder that slowly destroys memory and the ability to carry out a simple task.
• Our periodontium is comprised of four connective tissues: cementum, periodontal ligaments, alveolar bone, gingival tissue.
• A healthy periodontium is free of inflammation, absence of bleeding on probing, 1-2mm of bone loss below the cemento-enamel-junction.
• The oral-body systemic connection between the bacteria species (Treponema denticola, Treponema pallidum, and streptococcal species) found in periodontal disease in connection with worsening cognitive decline.

Review of Literature

• Research showed that four or more natural teeth decayed or broken and a reduction in chewing pairs were risk factors for cognitive frailty. Those with cognitive frailty scored higher on the Brief Oral Health Status Examination (BOHSE).
• Links between Alzheimer’s disease and periodontitis is systemic inflammation from the host immune response and invasion of proinflammatory cytokines on the blood-brain barrier.
• Neuronal damage stems from the peripheral nerves which triggers CNS inflammation.
• Elderly population are more susceptible for oral pathogens to cross blood-brain barrier, increasing the formation of senile plaques.
• Decreased chewing ability affects hippocampal neurons, which are needed for learning.
• Pts with Alzheimer’s Dementia have less chewing ability.

Discussion

• Direct link between periodontal disease and cognitive decline.
• Neuronal damage is caused by a breach in the blood-brain barrier, which leads to activation of microglial cells.
• Decrease in masticatory function directly impacts an individual’s nutrition leading to poor cerebral stimulation and blood flow.
• A study on animals, showed that the lack of posterior teeth/crowns had a negative impact on learning ability and cognitive function.
• BOHSE scores showed that the elderly with cognitive frailty were significantly higher compared to those with non-cognitive frailty.

Figure 1: Alzheimer’s & Periodontal Disease Cycle

Cyclic effect of tooth loss, leads to decreased masticatory function, leads to poor nutrition which ultimately leads to poor cerebral stimulation and blood flow which worsens the effect of Alzheimer’s.

References


