

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.

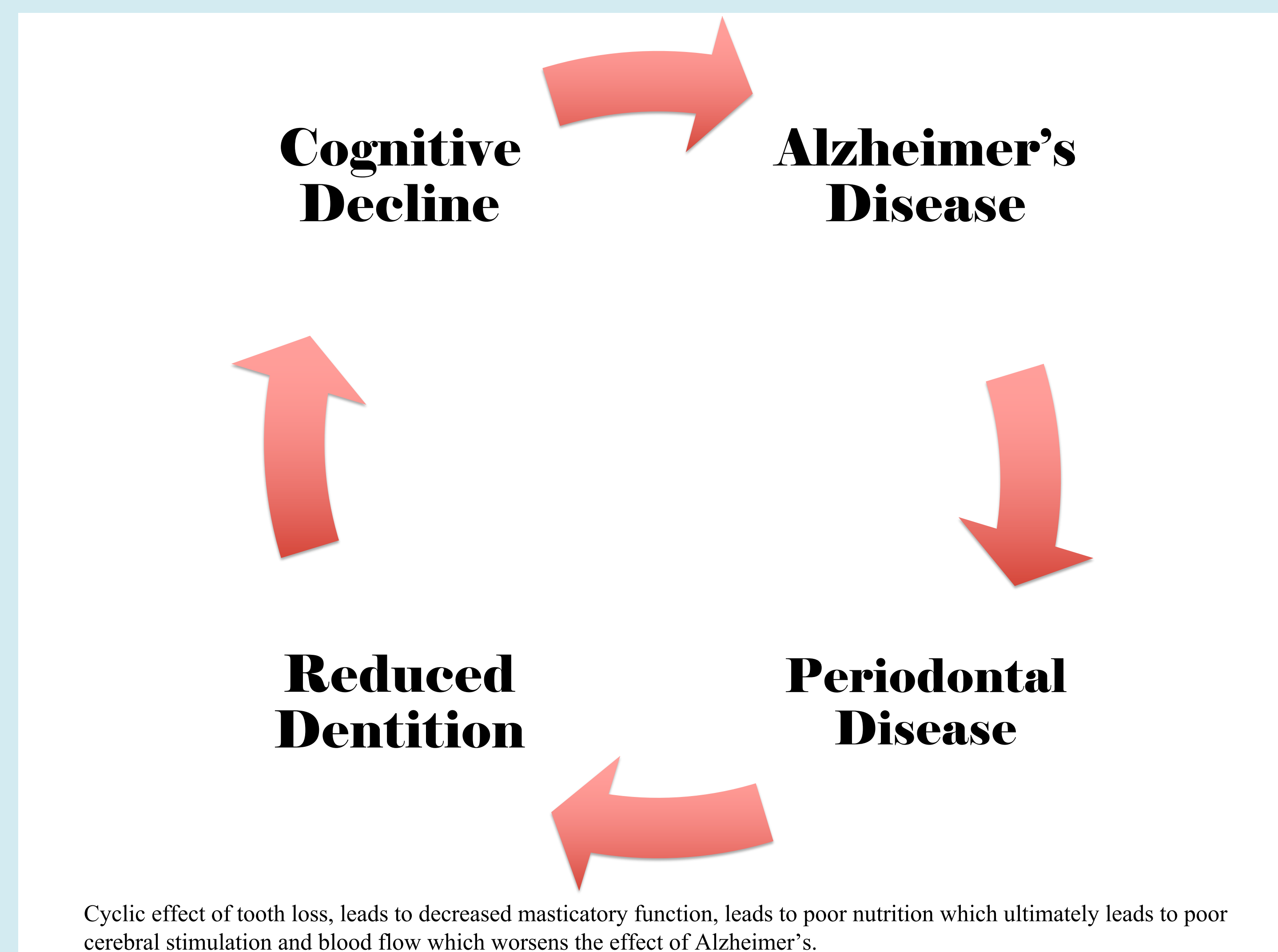
Introduction

- Alzheimer's disease is a brain disorder that slowly destroys memory and the ability to carry out a simple task.¹
- Our periodontium is comprised of four connective tissues: cementum, periodontal ligaments, alveolar bone, gingival tissue.²
- 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.³

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).⁴
- 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.⁵
- neuronal damage stems from the peripheral nerves which triggers CNS inflammation.⁵
- Elderly population are more susceptible for oral pathogens to cross blood-brain barrier, increasing the formation of senile plaques.⁵
- decreased chewing ability affects hippocampal neurons, which are needed for learning.⁶
- pts with Alzheimer's Dementia have less chewing ability.⁶

Figure 1: Alzheimer's & Periodontal Disease Cycle ⁵



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.³
- Decrease in masticatory function directly impacts an individuals nutrition leading to poor cerebral stimulation and blood flow. ⁵
- A study on animals, showed that the lack of posterior teeth/crowns had a negative impact on learning ability and cognitive function.⁶
- BOHSE scores showed that the elderly with cognitive frailty were significantly higher compared to those with non-cognitive frailty.³

Limitations

- There has only been studies on humans already diagnosed with Alzheimer's.
- There has been no research on the elimination of bacteria to show a positive incline in cognitive function

Strength:

- bacteria that is responsible for cognitive decline has been detected.

Conclusion

- Periodontitis leads to tooth loss which leads to difficulty with proper mastication, worsens cognition.
- Cognitive decline is affected by the inflammatory response that comes with periodontitis. ³
- Inflammation is a result of increase in white blood cells, leading to inflammation. ³
- Patients should get a form of prophy every three months to help arrest the periodontitis.
- While under treatment, patients should undergo a memory test to track their cognitive ability. As their periodontium improves clinicians would be able to track data and see if there is improvement in cognitive ability.

References

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