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Mini Review

Can a mouth wash prevent atherosclerosis and ischemic stroke?

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Abstract

Can a mouth wash prevent atherosclerosis and ischemic stroke? Is it a joke/dream/possibility in future? The mini review points to the possibility of controlling atherosclerosis and ischemic stroke through proper oral hygiene, regular dental check-up, removing tooth decay, preventing dental plaque and gum diseases. A systematic and detailed survey/study of oral health conditions among the neuro/cardio patients may be useful in improving their health recovery. Maintaining good oral health with regular brushing, flossing, and dental check-ups are crucial for preventing gum diseases. Moreover, mouthwash can be a helpful component of oral hygiene. Daily use of proven natural materials such as 0.1% turmeric mouthwash or coconut oil can reduce the chance of gum diseases.

Introduction

Poor oral health, particularly gum disease, has been linked to an increased risk of atherosclerosis and ischemic stroke. The theory behind this connection is that the bacteria involved in gum disease can enter the bloodstream and contribute to inflammation in the arteries, potentially promoting the development of atherosclerosis. Recent reports [1-6] and evidence suggests that atherosclerotic cardiovascular disease (ASCVD) is highly dependent on poor oral health. As we know, ASCVD is one of the leading cause of disability and death. Though, attempts to reduce the morbidity and mortality from ASCVD by the modification of established ASCVD risk factors is in good progress, other prevention strategies such as good oral health and prevention of periodontal disease (PD) may also contribute to reduce the cardiovascular risk and improvements in the overall wellbeing. PD leads to the irreversible destruction of the tooth and bone. Ohki *et al.* [1] reported the presence of periodontal bacteria in thrombi from patients with acute myocardial infarction. Reyes *et al.* [2] reported the presence of periodontal bacteria in atheromatous aortic plaques. Stoll and team reported [3] the possibility and evidence of periodontal bacteria to penetrate human vascular endothelium and cause endothelial dysfunction. Eugenia *et al.* [4] reviewed the growing evidence linking PD to ASCVD and concluded that PD was a significant risk factor for developing peripheral arterial diseases and an increased risk for ischemic stroke. Moreover, they reported that improvements in markers of systemic inflammation (hsCRP, IL-6, and MCP-1) were observed with proper dental hygiene. Maciej *et al.* [5] reported the presence of periodontal pathogens in atherosclerotic plaques, vascular endothelium, activation and aggregation of platelets as directly increase the progression of atherosclerosis at all its stages.

According to Harvard Medical school report [6] chronic, low-grade inflammation can turn into a silent killer that contributes to conditions like type 2 diabetes, cardiovascular disease, cancer and many other complications. Moreover, the risk of having stroke, heart attack, or other serious cardiovascular conditions is two to three times for those who is suffering from periodontal disease (PD), as PD increases inflammation and long-term inflammation is contributing significantly to diseased conditions such as atherosclerosis. According to the report, study by Hasturk and her colleagues by

treating experimental rabbits with a topical liquid agent contained resolvins which acts as oral mouth wash, could be able to prevent not only periodontal disease in the infected rabbits, but also lower inflammation and atherosclerosis. Resolvins are molecules derived from omega-3 fatty acids [6].

Kuptniratsaikul *et al.* [7] reported curcumin supplementation significantly decreases serum concentrations of pro-inflammatory cytokines in subjects with Metabolic syndrome (MetS). Amitha *et al.* [8] reported that 0.1% turmeric mouthwash have shown comparable properties for the prevention of plaque and gingivitis with 0.2% chlorhexidine gluconate, which is considered as the gold standard in dentistry as an anti-plaque, anti-inflammatory, and anti-microbial material. They concluded the study by evaluating the effect on plaque, gingival inflammation and on microbial load. Lalitha *et al.* [9] reported that, curcumin based mouthwash, was found to be comparable in plaque reduction as that of chlorhexidine and better in reducing gingival inflammation as evident clinically. Reduction of reactive oxidative metabolites (ROM) is reported.

Pussinen and co-workers reported [10] the relationship between childhood caries and waist circumference in adulthood. Individual with childhood caries reported to have large waist circumference [10]. In addition to this, caries leads to local glycemia, acid production and cariogenic biofilm formation. Childhood periodontitis leads to systemic hyperglycemia and oxidative stress trigger advanced glycation. These conditions finally ending to inflammation increased diastolic and systolic blood pressure in adulthood, development of hypertension and metabolic dysfunction. Their study results emphasized the importance of childhood oral care for prevention of hypertension, metabolic dysfunction and with metabolic syndrome (MetS) in adults. According to the study, the number of cardiovascular disease risk factors is higher in adolescents with dental caries and gingival inflammation compared to those have good oral health. Periodontitis has been associated [10] with reduction of HDL functionality and HDL cholesterol and with elevation of low-density lipoprotein cholesterol and triglyceride concentrations in adults.

Initial symptoms of inflammation of the gingival is called gingivitis, which is reversible with the removal of plaque [11]. However, chances of recurrent plaque formation are very high in susceptible individual, which can lead to periodontitis. Therefore, regular maintenance of oral hygiene is essential to prevent gum diseases. Maintaining good oral health with regular brushing, flossing, and dental check-ups are crucial for preventing gum diseases. Unfortunately, oral hygiene habits, oral health, visits to dentist, treatments, or use of fluoride have been related to the poverty, education, financial status, family support and many more. As a natural product, turmeric (curcumin) is nontoxic [12] in low concentrations, easily available, used as an ingredient in many food recipes, ayurvedic medical formulations and has diversified effects in various oral diseases. The simple use of the golden yellow spice as a mouthwash may be helpful in prevention of gum diseases initially and other complicated life style diseases in their later life.

Conclusion

Poor oral health, particularly gum disease, has been linked to an increased risk of cardiovascular diseases like atherosclerosis and ischemic stroke. The theory behind this connection is that the bacteria involved in gum disease can enter the bloodstream and contribute to inflammation in the arteries, potentially promoting the development of atherosclerosis. Simple tips to fight inflammation will be useful to prevent atherosclerosis, ischemic stroke and stay healthy. In short, even though, mouthwash is not a stand-alone solution for preventing atherosclerosis or ischemic stroke, using mouthwash as a part of a comprehensive oral hygiene routine can help reduce the risk of gum disease and may indirectly contribute to better cardiovascular health.

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References

1. Ohki T, Itabashi Y, Kohno T, Yoshizawa A, Nishikubo S, Watanabe S, et al. Detection of periodontal bacteria in thrombi of patients with acute myocardial infarction by polymerase chain reaction. American Heart Journal. 2012 Feb 1;163(2):164-7.
2. Reyes L, Herrera D, Kozarov E, Roldán S, Progulske-Fox A. Periodontal bacterial invasion and infection: contribution to atherosclerotic pathology. Journal of Clinical Periodontology. 2013 Apr;40:S30-50.
3. Stoll LL, Denning GM, Weintraub NL. Potential role of endotoxin as a proinflammatory mediator of atherosclerosis. Arteriosclerosis, Thrombosis, and Vascular Biology. 2004 Dec 1;24(12):2227-36.
4. Gianos E, Jackson EA, Tejpal A, Aspry K, O'Keefe J, Aggarwal M, et al. Oral health and atherosclerotic cardiovascular disease: A review. American Journal of Preventive Cardiology. 2021 Sep 1;7:100179.
5. Czerniuk MR, Surma S, Romańczyk M, Nowak JM, Wojtowicz A, Filipiak KJ. Unexpected relationships: Periodontal diseases: Atherosclerosis–plaque destabilization? From the teeth to a Coronary Event. Biology. 2022 Feb 9;11(2):272.
6. Gum disease and heart disease: The common thread How plaque on your teeth may be connected to plaque in your arteries. Harvard Heart Letter. Published: February 15, 2021.
7. Kuptniratsaikul V, Dajpratham P, Taechaarpornkul W, Buntragulpoontawee M, Lukkanapichonchut P, Chootip C, et al. Efficacy and safety of Curcuma domestica extracts compared with ibuprofen in patients with knee osteoarthritis: a multicenter study. Clinical Interventions in Aging. 2014 Mar 20:451-8.
8. Mali AM, Behal R, Gilda SS. Comparative evaluation of 0.1% turmeric mouthwash with 0.2% chlorhexidine gluconate in prevention of plaque and gingivitis: A clinical and microbiological study. Journal of Indian Society of Periodontology. 2012 Jul 1;16(3):386-91.
9. Arunachalam LT, Sudhakar U, Vasanth J, Khumukchum S, Selvam VV. Comparison of anti-plaque and anti-gingivitis effect of curcumin and chlorhexidine mouth rinse in the treatment of gingivitis: A clinical and biochemical study. Journal of Indian Society of Periodontology. 2017 Nov 1;21(6):478-83.
10. Pussinen PJ, Paju S, Viikari J, Salminen A, Taittonen L, Laitinen T, et al. Childhood oral infections associate with adulthood metabolic syndrome: A longitudinal cohort study. Journal of Dental Research. 2020 Sep;99(10):1165-73.
11. Nagpal M, Sood S. Role of curcumin in systemic and oral health: An overview. Journal of Natural Science, Biology, and Medicine. 2013 Jan;4(1):3-7.
12. Lizymol PP. Periodontitis Challenges and Possibilities. Trends in Biomaterials and Artificial Organs. 2021 Oct 1;35(4):397-9.