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A Review Article in:

Oral diseases related to cardiovascular disease

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بسم الله الرحمن الرحيم

فَتَعَالَى اللَّهُ الْمَلِكُ الْحَقُّ وَلَا تَعْجَلْ بِالْقُرْآنِ مِنْ قَبْلِ أَنْ يُقْضَىٰ إِلَيْكَ وَحْيُهُ وَقُلْ رَبِّ زِدْنِي عِلْمًا ﴿١١٤﴾

صدق الله العلي العظيم

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Dedication To

I dedicate this small project to the most precious and my first teachers my parents may Allah bless them.

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I owe a great many thanks to the great people who helped and supported me to complete this project**.**

My deepest thanks to (**Dr. Ali Hakiem**) my teacher and supervisor for guiding me in the article by correcting the mistakes and giving his valuable opinions in many aspect in both scientific facts and literature ones. I hope all the best and successes to him in his career and future.

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Abstract

We aimed to explore associations of oral health problems with cardiovascular disease (CVD), Oral health comprised tooth loss, periodontal disease, dry mouth, and self-rated oral health. Regression was performed for all-cause mortality, competing risks for CVD mortality, tooth loss, dry mouth, and having ≥ 3 oral problems were associated with all-cause mortality; periodontal disease was associated with increased CVD mortality

Findings suggest that poor oral health is associated with mortality.

Results highlight the importance of improving oral health to lengthen survival in older age.

We discussed in this short review the most common oral health issues associated with heart disease and how to deal with them.

Keywords: oral health, hygiene, heart disease

Introduction

In the last decade, the importance of oral health with heart disease has garnered the attention of policymakers, foundations, agencies, and health care providers who serve patient with heart disease. The U.S. Surgeon General, World Health Organization, and American College of cardiology have all recognized that oral health is an integral part of preventive health care for people with heart disease (1).

Cardiac disease involves complex physical changes that have a significant impact on almost every organ system, including the oral cavity imposing on health professionals the need for a differentiated approach. oral health is often disregarded during cardiac disease by professionals who perform care and even by dentists (2).

Maintaining good oral health has the potential to improve the health and well being of and overall health later in life. The link between oral diseases and tooth loss, cardiovascular disease, and diabetes cannot be ignored. Realization and acceptance of the importance of oral health among our patient population is critical if we are to continue to provide quality care to the patient of this country (3).

In this review article, we will demonstrate the most common oral health issues during cardiovascular disease and how to treat and prevent them and their possible complications.

Patient with cardiovascular disease are particularly susceptible to gingival and periodontal disease. In this context, different oral lesions are reported to be common during cardiovascular disease. In effect, an increased prevalence of dental alterations have also been documented, including particularly caries and erosions. (4).

There is high quality evidence to support an association between cardiovascular disease and oral health. This evidence mainly is related to the association between chronic periodontitis and atherosclerotic heart disease and is independent of confounding factors as drawn from epidemiological observational studies. Notably, no causal relationship has been established between cardiovascular disease and periodontal disease and the results suggest associations of varied strength between other oral diseases such as caries and oral facial pain and cardiovascular disease. (5).

Cardiovascular disease and caries / endodontic disease

A systematic review by Dai et al. found that patients with stroke have significantly higher caries prevalence (DMFT) scores than healthy controls. An earlier systematic review of moderate quality evaluated the potential association between apical periodontitis/endodontic disease and CVD, but found scarce evidence to support this link

In summary, there is some evidence that dental caries and disease associated with infections from dental caries or periodontal tissues are associated with incidence of cardiovascular disease. (6).

Periodontal diseases

Periodontal disease is a wide-affecting infectious disease consisting of various forms. Based on its severity, periodontal disease can be broadly classified into two stages: gingivitis, a mild and reversible form characterized by inflammation without tissue damage; and periodontitis, a more advanced and severe form characterized by attachment and bone loss. The potential connection between periodontal disease and other systemic conditions, such as, cardiovascular disease, diabetes and preterm birth, has attracted much research attention in recent decades (7).

Stroke and oral health promotion

Two systematic reviews, of which one was a Cochrane review, show that use of oral health promotion could improve oral health of stroke patients. This includes, periodontal therapy or prophylactic extractions and particularly healthcare training on oral health promotion

In summary, for patients who have suffered a stroke, oral health promotion can have a significant impact on their oral health. (8).

Cardiovascular disease and periodontal treatment

Periodontal treatment has been shown to have the following effects on surrogate markers implicated in cardiovascular disease: reduction in levels of C reactive protein, improvement in endothelial function, and reduction in carotid intima-medial thickness (c-IMT). D'Aiuto et al. (2013) reported moderate evidence of a negligible effect of periodontal therapy in reducing interleukin6 and lipid levels, and limited evidence on the effects on the following surrogates: arterial blood pressure, leucocyte counts, fibrinogen, tissue necrosis factorα, sE-selectin, von Willebrand factors, D-dimers, matrix metalloproteinase, oxidative stress and CVD events. There was no evidence on the effects of periodontal therapy on subclinical atherosclerosis, serum levels of CD40 ligand, serum amyloid A and monocyte chemo attractant protein. (9)

Atherosclerotic cardiovascular disease and tooth loss

suggest that tooth loss is associated with an increased risk of cardiovascular disease, in particular the risk of coronary heart disease and stroke, as outlined below.

Coronary heart disease and tooth loss

Humphrey et al. (2008)15 pooled estimates, demonstrating that individuals with 0–10 teeth had a relative risk of coronary heart disease and coronary death of 1.34 (95% CI 1.10–1.63) compared to patients with 25–32 teeth (P = 0.02). A later meta-analysis by Helfand et al. in 2009 likewise demonstrated a 1.34 relative risk (CI, 1.10–1.63) of general cardiovascular disease for persons with 0–10 teeth compared to those with >10 teeth. (10)

Cerebrovascular disease stroke and tooth loss

A meta-analysis by Lafon *et al*. (2014) indicated a pooled risk estimate of 1.39 (1.13, 1.65) when ischemic and both ischemic and hemorrhagic strokes were considered together for edentulous patients compared with dentate patients.

A meta-analysis by Lafon et al. (2014) indicated a pooled risk estimate of 1.39 (1.13, 1.65) when ischemic and both ischemic and hemorrhagic strokes were considered together for edentulous patients compared with dentate patients. (11)

Circulatory mortality and tooth loss

Polzer et al. (2012) reported that 12 out of 15 studies showed an increased risk of all-cause mortality among individuals with high numbers of missing teeth; seven out of nine studies demonstrated increased circulatory mortality (defined as a primary cardiac cause) in this group.

In summary, although the cause of tooth loss is unclear, the evidence suggests that patients with fewer teeth are more likely to suffer cardiovascular disease and cardiovascular-related death. (12)

Stroke and oral health related quality of life

The systematic review by Dai et al. (2015) highlights that stroke patients have poorer oral health-related quality of life and oral function. It is unclear whether this represents disease association or simply a manifestation of reduced dexterity.

In summary, oral health-related quality of life of stroke patients is significantly worse than those who have not suffered stroke.

Quality of life of patients who have suffered stroke is significantly altered and the implication of changes in dexterity and oral muscular function can cause further challenges. A daily regime of care should be instituted to maintain oral health, and activities to support careers in this role will also be helpful. (8)

Dental Care

Screening

Every patient with heart disease should be assessed for dental hygiene habits, access to fluoridated water, oral problems (e.g., caries, gingivitis), and access to dental care. Oral examination should include the teeth, gums, tongue, palate, and mucosa. Patients should be counseled to perform routine brushing and flossing, to avoid excessive amounts of sugary snacks and drinks, and to consult a dentist. Status of and plans for oral health should be documented. Many dentists are reported to be reluctant to treat patient with heart disease. Physicians and dentists can overcome this situation through education, clear communication, and the development of ongoing collaborative relationships. Physicians can share information on the safety of dental treatment in heart disease with dental colleagues and provide clear referral recommendations (13).

How to improve the oral health?

health care providers, including dentists, need more knowledge and clarification about the safety of dental treatments in patient with heart disease. Dental care, and there are appropriate guidelines for the treatment of patients. Dental visits can take place during any trimester and, if urgent, should never be delayed. The risk of radiation exposure is extremely low when lead aprons are used during dental x-ray imaging. The most common medications and anesthetics prescribed by dentists are in U.S. Food and Drug Administration Category B and these drugs have not been found to be a risk (14).

Prevention of oral diseases

Although a number of non-invasive preventive interventions, traditional health education is considered as the gold standard for imparting knowledge and encouraging parents on preventive interventions. "Traditional health education" is a means of conducting counselling sessions by health care providers and/or the dissemination of information by means of pamphlets, posters and media campaigns (15). known and accepted anti-caries agent available, and chlorhexidine is the most widely used plaque-inhibitory compound. The mechanism of action of these two agents is completely different, and their combined administration produces a synergistic effect on *streptococcus mutans* (16).

Conclusion

There is high quality evidence to support an association between cardiovascular disease and oral health. This evidence is mainly related to the association between chronic periodontitis and atherosclerotic heart disease, and is independent of confounding factors as drawn from epidemiological observational studies.

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