



DENTAL CONSIDERATIONS IN PATIENTS WITH CARDIOVASCULAR DISEASES

Khaled Taib Ageely^{1*}, Abdullah Abdu Khormi¹, Amr Omair Alotaibi², Khalid Saad Alhuwayzi³, Ali Salem Alharthi⁴, Abdulhadi Abdulelah Alanazi⁵, Ziad Abdullah Alsaghir⁶, Abdulkader Abdulelah Abulhamayel⁷, Abdulaziz Fareed Alsulaimani⁸, Ahmed Oudah Abughandar⁹, Abdulmajeed Ali Assiri¹⁰, Ali Salem Alfaer¹¹, Razin Hassan Subahi¹²

Abstract

Managing patients with heart conditions in clinical settings involves a complex process that necessitates teamwork. Key aspects of patient care encompass treating gum disease, managing bleeding risks, and being cautious about potential medication interactions. Prioritizing patients' psychological needs by addressing stress and anxiety can significantly enhance their overall healthcare experience. Strict adherence to infection control measures further boosts safety. Furthermore, the research underscores the critical role of regular cardiovascular assessments and collaboration between dental and medical teams in optimizing care for patients with heart conditions. As healthcare practices evolve, these insights offer valuable guidance for ensuring safe and effective dental care for individuals with heart conditions, ultimately enhancing their holistic health experience. Therefore, this study aims to review the dental Considerations in Patients with Cardiovascular Diseases.

Keyword: Antibiotic prophylaxis, Bidirectional relationship, Cardiovascular diseases, Clinical management, Periodontal therapy

¹*Ministry of Health, Jazan, Saudi Arabia

²Ministry of Health, Jeddah, Saudi Arabia

³Abha Specialized Dental Center, Abha, Saudi Arabia

⁴Muhayil Specialized Dental Center, 32 Dental Clinic, Abha, Saudi Arabia

⁵Ministry of Health, Tabuk, Saudi Arabia

⁶Al Bukayriah General Hospital, Al Bukayriah, Saudi Arabia

⁷Dental Department, Khulais General Hospital, Khulais, Saudi Arabia

⁸Dental Department, Al Thager General Hospital, Jeddah, Saudi Arabia

⁹Al-Jabriya Primary Healthcare Center, Ministry of Health, Yanbu, Saudi Arabia

¹⁰Department of Restorative Dentistry, Al Thager Hospital, Jeddah, Saudi Arabia

¹¹Department of Prosthodontic, Rabigh General Hospital, Rabigh, Saudi Arabia

¹²Department of Prosthodontics, Al Thager Hospital, Jeddah, Saudi Arabia

***Corresponding author:** Khaled Taib Ageely

*Ministry of Health, Jazan, Saudi Arabia. Email: khaledageely1991@gmail.com

DOI: 10.53555/ecb/2023.12.5.527

Introduction

Cardiovascular diseases, which include conditions affecting the heart and blood vessels, are a global health issue. The relationship between care and cardiovascular health is a factor that dental professionals need to consider. One key link connecting health to diseases is the impact of periodontal disease (1-3). This chronic inflammatory condition that affects the support structures of teeth has been linked to an increased risk of developing heart-related disorders. The connection stems from the interactions among agents, endothelial function, and the potential spread of oral bacteria into the bloodstream. Research consistently shows a link between bacteria and the advancement of atherosclerosis, a feature in many heart conditions. Notably, *Porphyromonas gingivalis*, a bacterium in gum disease, has been associated with the formation of plaques (4, 5). This connection highlights how oral health can have effects on health and stresses the importance of managing gum health carefully in patients with heart issues. Moreover, the shared inflammation mechanisms between gum disease and cardiovascular conditions underscore the need for an approach to care (6, 7). Inflammatory markers like C-reactive protein (CRP) are present in both heart-related contexts, showing how inflammation affects the body. Understanding this link, dentists need to work with doctors to improve treatment results, taking into account the inflammation levels in individuals with heart conditions (8, 9). When it comes to procedures dealing with disease, medications bring in extra factors to consider. Patients receiving treatment often prescribed for heart disease face challenges when undergoing dental procedures. Balancing the need to minimize bleeding risks while ensuring stability requires coordination between dental and medical professionals. Additionally potential interactions between medications and those used in dentistry thorough evaluation to guarantee patient safety and treatment effectiveness. In addition to these aspects, the emotional impact of procedures on heart health is significant. Individuals with heart conditions may experience increased anxiety or stress related to treatments, which could potentially worsen their heart health (10, 11). Dental professionals should take a patient-centered approach by incorporating anxiety-reducing techniques and effective communication to address these aspects. Collaborating with health experts may be necessary to address the psychological dimensions of dental care for this population. Therefore, managing the relationship between care and heart disease requires a comprehensive approach to patient well-being. Factors such as

gum health, inflammation processes, medication management, and psychological well-being all play roles in maintaining oral and cardiovascular health. Dental practitioners must stay attentive in understanding these complexities. Collaborate closely with colleagues to ensure optimal outcomes for patients. This study aims to explore the considerations surrounding care for individuals with heart disease.

Method

Our investigation, based on studies conducted in English from 2008 onwards, concentrated on dental considerations in patients with cardiovascular diseases, utilizing the PubMed and Scopus databases. The analysis aimed to highlight assessment methodologies and early warning systems relevant to the intersection of oral health and cardiovascular health. Keywords such as "cardiovascular diseases and dentistry," "oral health in heart patients," and "dental considerations in cardiovascular diseases" directed our literature search.

Discussion

Managing patients with heart conditions in a setting requires a teamwork-oriented strategy. The strong connection between gum disease and heart issues stresses the significance of detection and specific treatments. Gum therapy, such as cleaning, plays a role in reducing bacteria in the mouth and promoting oral health (12). Balancing the risks of bleeding for patients taking blood thinners calls for coordination between dental and medical experts. Considering potential interactions between medications further underscores the importance of care to ensure patient safety and well-being (13, 14). Additionally, emphasizing patient-focused care addresses the stress and worry linked to procedures. Open communication, a soothing atmosphere, and cooperation with health professionals all contribute to creating a dental experience for individuals with heart conditions. Implementing infection control measures, like use, when necessary, enhances the clinical management approach.

Mechanism

The connection between health and cardiovascular diseases involves processes that highlight the importance of recognizing their interrelated nature. One crucial factor is the body's response. In individuals with conditions, persistent inflammation is a factor, and this inflammatory state can influence oral health as well. Periodontal disease, which involves inflammation and bacterial infection in the tissues supporting the teeth, acts as

a source of inflammation. The release of substances in gum tissues may contribute to a pro-inflammatory state that impacts heart health. Additionally, oral bacteria and their products entering the bloodstream during activities like eating or dental treatments can potentially travel to areas such as the cardiovascular system. This movement of microbes could trigger a reaction and play a role in forming artery-clogging plaques or worsening existing heart issues. Recognizing the connections between heart health is crucial for healthcare providers to develop preventive measures and treatment strategies that address both aspects holistically. It underscores the importance of collaboration between cardiovascular professionals to improve care and lessen the effects of these linked health conditions.

Clinical Manifestation

Cardiovascular diseases (CVD) and their complex relationship with health present a clinical scenario that dental professionals need to navigate. One significant clinical aspect involves the two-way connection between disease and cardiovascular issues. Inflammation in the tissues that support teeth, known as disease, has been recognized as a contributing factor to disease. The inflammatory substances associated with periodontitis, such as cytokines and prostaglandins, can add to the load in the body, contributing to the development and advancement of atherosclerosis, a crucial element in many cardiovascular conditions (15, 16). Additionally, certain specific oral pathogens linked to disease have been associated with the formation of plaques. These oral pathogens can trigger a response throughout the body, further establishing a link between gum health and cardiovascular results. Recognizing and understanding the indicators of disease in individuals with cardiovascular conditions is essential for effectively managing their overall health (17, 18). Clinical signs may include redness or swelling of gums, bleeding during probing pockets forming around teeth, and, in some instances, loosening of teeth. The connection extends to increased levels of markers like C reactive protein (CRP), which are found in both heart-related situations. Elevated CRP levels act as an indicator linking health to risks by highlighting how inflammation plays a role across both conditions. Dentists need to evaluate and keep an eye on these indicators, taking into account how they could affect heart health. Handling medications, for conditions is another aspect that dentists need to consider. Using blood thinners, which are often given for heart disease, can be tricky when performing procedures that are more invasive. The delicate balance between

preventing blood clotting issues and avoiding bleeding requires cooperation between dental and medical professionals. Practically, this involves an evaluation of bleeding risks and personalized treatment plans. Potentially adjusting blood thinning medications around the time of dental procedures to ensure patient safety. Moreover, the possible interactions between medications used for heart conditions and those prescribed in dentistry need attention. The use of vasoconstrictors in anesthesia, which are common in dental practice, may raise concerns for patients with high blood pressure or heart disease. If a patient shows signs of blood pressure or irregular heartbeat during treatments, it is important to understand their medication regimen and work closely with cardiologists for safe dental care (19, 20). Apart from these aspects, the impact of factors on patients with heart conditions seeking dental treatment is significant. Anxiety and stress related to procedures can potentially worsen heart conditions. Dental professionals should focus on patient-centered approaches by using communication and strategies to reduce anxiety. Identifying signs of anxiety like increased heart rate or high blood pressure is crucial in customizing the experience to minimize stress and its potential effects on heart health. So, recognizing how dental considerations interact with diseases highlights the importance of a holistic approach to patient care. Periodontal issues, inflammation indicators, medication strategies, and emotional aspects all play a role in the scenario. Dentists and doctors need to work to address these issues and improve the overall oral and heart health of their patients.

Management

The dental care of patients with heart diseases in an office involves a team effort that considers both health and heart wellness. A key part of care revolves around the link between gum disease and heart issues. Dentists have a role in spotting and dealing with signs of gum disease as it can affect heart health. The first step is to assess the patient's gum health, looking for signs like inflamed gums bleeding when probed pockets around teeth and loose teeth. Measuring gum pocket depths and using X-rays help determine the extent of gum disease. Once gum disease is confirmed, a treatment plan can be created. Scaling and root planning are surgical treatments to manage patients with both gum disease and heart conditions by reducing bacteria, controlling inflammation, and promoting healthy gums (21). Dentists need to be careful during these procedures to minimize the risk of bacteria entering the bloodstream, which could harm patients with heart issues on blood

thinners. Coordinating the care involves a partnership between medical experts in deciding how to handle anticoagulant medications before surgery. Temporary changes to blood thinning treatment might be taken into account, and the scheduling of procedures could be coordinated with the patient's heart specialist to enhance both heart health results. It's crucial for healthcare providers to pay attention to interactions between medications and those used in dental care. The use of vasoconstrictors in anesthesia could be problematic for individuals with blood pressure or coronary artery disease. Dental professionals need to be mindful of side effects and work closely with cardiologists to ensure dental treatments. Educating patients about managing their medications and potential drug interactions is an aspect of care. Besides focusing on health concerns, managing patients with heart conditions involves addressing inflammatory markers in the body. C-reactive protein (CRP), a marker linked to gum disease and heart risk, reflects the level of inflammation in a person's body. Monitoring CRP levels and collaborating with professionals to manage inflammation through comprehensive care contribute positively to the patient's overall health. Providing patient-centered care is essential when treating individuals with heart conditions who are seeking help. Anxiety and stress related to procedures can impact heart health, so it's important for dental professionals to implement strategies, like communication, creating a calming atmosphere, and considering medication options when needed. Recognizing and effectively addressing the signs of stress is crucial in providing a dental visit while maintaining cardiovascular health (22, 23). When it comes to surgery or invasive dental procedures, managing patients with heart conditions involves focusing on infection control. Some patients may need antibiotics to avoid endocarditis, especially if they have heart issues. The decision to use therapy is based on a patient's risk factors and medical history. For people with heart problems, regular dental visits are essential for monitoring their health, catching problems early, and providing timely care. This proactive approach helps in managing both heart health. Therefore, treating patients with heart conditions in a setting requires a thorough approach. Dealing with the connection between gum disease and heart disorders, handling bleeding risks from blood thinners, understanding medication interactions, and recognizing signs of inflammation are all aspects. Providing patient-centered care that includes addressing stress, infection control measures, and ongoing monitoring plays a role in improving the oral and

cardiovascular health of those with cardiovascular diseases. Dentists, working closely with healthcare providers, have a role in providing comprehensive and efficient care for these individuals.

Conclusion

In conclusion, managing patients with heart conditions in a setting is an ever-changing process. The relationship between gum disease and heart health needs monitoring and care. Dentists and doctors working together focusing on medication control bleeding risks and preventing infections play a role in improving patient outcomes. By prioritizing patient needs and considering their well-being, we can take an approach to looking after both their dental and heart health. As the field progresses, this all-encompassing approach to care is crucial for providing safe dental treatment for those with heart issues.

Reference

1. Dhadse P, Gattani D, Mishra R. The link between periodontal disease and cardiovascular disease: How far we have come in last two decades ? J Indian Soc Periodontol. 2010;14(3):148-54.
2. Shetty B, Fazal I, Khan SF, Nambiar M, D KI, Prasad R, Raj A. Association between cardiovascular diseases and periodontal disease: more than what meets the eye. Drug Target Insights. 2023;17:31-8.
3. Herrera D, Sanz M, Shapira L, Brotons C, Chapple I, Frese T, et al. Association between periodontal diseases and cardiovascular diseases, diabetes and respiratory diseases: Consensus report of the Joint Workshop by the European Federation of Periodontology (EFP) and the European arm of the World Organization of Family Doctors (WONCA Europe). Journal of Clinical Periodontology. 2023;50(6):819-41.
4. Mei F, Xie M, Huang X, Long Y, Lu X, Wang X, Chen L. Porphyromonas gingivalis and Its Systemic Impact: Current Status. Pathogens. 2020;9(11).
5. Zhang J, Xie M, Huang X, Chen G, Yin Y, Lu X, et al. The Effects of Porphyromonas gingivalis on Atherosclerosis-Related Cells. Front Immunol. 2021;12:766560.
6. Makkar H, Reynolds MA, Wadhawan A, Dagdag A, Merchant AT, Postolache TT. Periodontal, metabolic, and cardiovascular disease: Exploring the role of inflammation and mental health. Pteridines. 2018;29(1):124-63.
7. Febbraio M, Roy CB, Levin L. Is There a Causal Link Between Periodontitis and Cardiovascular

- Disease? A Concise Review of Recent Findings. *Int Dent J.* 2022;72(1):37-51.
8. Sproston NR, Ashworth JJ. Role of C-Reactive Protein at Sites of Inflammation and Infection. *Front Immunol.* 2018;9:754.
 9. Medina-Leyte DJ, Zepeda-García O, Domínguez-Pérez M, González-Garrido A, Villarreal-Molina T, Jacobo-Albavera L. Endothelial Dysfunction, Inflammation and Coronary Artery Disease: Potential Biomarkers and Promising Therapeutical Approaches. *International Journal of Molecular Sciences.* 2021;22(8):3850.
 10. Khayyam-Nekouei Z, Neshatdoost H, Yousefi A, Sadeghi M, Manshaee G. Psychological factors and coronary heart disease. *ARYA Atheroscler.* 2013;9(1):102-11.
 11. Vlachakis C, Dragoumani K, Raftopoulou S, Mantaïou M, Papageorgiou L, Champeris Tsaniras S, et al. Human Emotions on the Onset of Cardiovascular and Small Vessel Related Diseases. *In Vivo.* 2018;32(4):859-70.
 12. Liu W, Cao Y, Dong L, Zhu Y, Wu Y, Lv Z, et al. Periodontal therapy for primary or secondary prevention of cardiovascular disease in people with periodontitis. *Cochrane Database Syst Rev.* 2019;12(12):Cd009197.
 13. Motta RHL, Bergamaschi CC, de Andrade NK, Guimaraes CC, Ramacciato JC, Araújo JO, Lopes LC. Bleeding risk in patients using oral anticoagulants submitted to surgical procedures in dentistry: a systematic review protocol. *BMJ Open.* 2017;7(12):e019161.
 14. de Andrade NK, Motta RHL, Bergamaschi CC, Oliveira LB, Guimarães CC, Araújo JO, Lopes LC. Bleeding Risk in Patients Using Oral Anticoagulants Undergoing Surgical Procedures in Dentistry: A Systematic Review and Meta-Analysis. *Front Pharmacol.* 2019;10:866.
 15. Zardawi F, Gul S, Abdulkareem A, Sha A, Yates J. Association Between Periodontal Disease and Atherosclerotic Cardiovascular Diseases: Revisited. *Frontiers in Cardiovascular Medicine.* 2021;7.
 16. Visentin D, Gobin I, Maglica Ž. Periodontal Pathogens and Their Links to Neuroinflammation and Neurodegeneration. *Microorganisms.* 2023;11(7):1832.
 17. Francula-Zaninovic S, Nola IA. Management of Measurable Variable Cardiovascular Disease' Risk Factors. *Curr Cardiol Rev.* 2018;14(3):153-63.
 18. Schwalm JD, McKee M, Huffman MD, Yusuf S. Resource Effective Strategies to Prevent and Treat Cardiovascular Disease. *Circulation.* 2016;133(8):742-55.
 19. Chaudhry S, Jaiswal R, Sachdeva S. Dental considerations in cardiovascular patients: A practical perspective. *Indian Heart J.* 2016;68(4):572-5.
 20. Lambrecht JT, Filippi A, Arrigoni J. Cardiovascular monitoring and its consequences in oral surgery. *Ann Maxillofac Surg.* 2011;1(2):102-6.
 21. Roshna T, Nandakumar K. Generalized aggressive periodontitis and its treatment options: case reports and review of the literature. *Case Rep Med.* 2012;2012:535321.
 22. Appukuttan DP. Strategies to manage patients with dental anxiety and dental phobia: literature review. *Clin Cosmet Investig Dent.* 2016;8:35-50.
 23. Hoffmann B, Erwood K, Ncomanzi S, Fischer V, O'Brien D, Lee A. Management strategies for adult patients with dental anxiety in the dental clinic: a systematic review. *Aust Dent J.* 2022;67 Suppl 1(Suppl 1):S3-s13.