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Review Article

Dental considerations in cardiovascular patients: A practical perspective

Swantika Chaudhry^{a,*}, Ritika Jaiswal^a, Surender Sachdeva^b^a Senior Lecturer, Department of Periodontology and Oral Implantology, MMCD, Mullana, Ambala, India^b Professor and Head, Department of Periodontology and Oral Implantology, MMCD, Mullana, Ambala, India

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ABSTRACT

Cardiovascular disease trends, complications, and associated therapeutics impact the dental health and treatment. Such patients require special consideration with regard to when and which dental treatment is appropriate and what precautions are required. Alertness to potential oral adverse drug reactions enables referral of patient's to his physician or cardiologist. Cardiovascular drugs are also known to have mild to potentially fatal drug interactions. Dental professionals may be the first line of defense in the detection and referral of a patient suspected of having cardiovascular disease, an uncontrolled disease status, or oral adverse drug reactions, and they have a key role to play in oral and systemic disease prevention and treatment, in partnership with the patient and his physician.

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1. Introduction

Cardiovascular diseases (CVD) comprise of a group of diseases of the heart and vascular system affecting majority of individuals worldwide. Ischemic heart disease, Hypertension, Dysrhythmias, and Infective Endocarditis are some of the cardiovascular conditions most commonly seen among the population. Co-existent cardiovascular disease is the most frequently cited medical condition for patient referral from general dental practitioners to hospital departments, which reflects widespread concern over potential problems during treatment. Dentists must be able to identify medical emergencies and adopt the opportune measures to avoid them or treat them quickly and effectively. A comprehensive treatment plan should be constructed keeping in view all the pros and cons related to the patient's medical condition.¹ Thus, the present review throws some light on various cardiovascular

conditions commonly seen in dental practice and a systematic approach toward their management.

2. Relationship of cardiovascular disease and periodontitis

Periodontitis has been proposed as having an etiological or modulating role in cardiovascular and cerebrovascular disease, diabetes, respiratory disease, and adverse pregnancy outcome and several mechanisms have been proposed to explain or support such theories and oral lesions are indicators of disease progression and oral cavity can be a window to overall health and body systems. One of these is based around the potential for the inflammatory phenomenon of periodontitis to have effects by the systemic dissemination of locally produced mediators such as C-reactive proteins (CRP), interleukin-1 β (1L-1 β) and interleukin-6 (1L-6), and TNF- α .²

* Corresponding author.

E-mail addresses: swantikachaudhry@gmail.com (S. Chaudhry), ritikajas@gmail.com (R. Jaiswal), drsksporio@gmail.com (S. Sachdeva).
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Another indirect effect of periodontal infection that may explain the association between periodontal disease and heart disease is that periodontal organisms contain proteins which cross-react with the heart. The heat-shock protein-60, which is produced by *Tannerella forsythia* and *Porphyromonas gingivalis*, has about 60% homology with the mammalian heat-shock protein. It is known that antibodies to the heat-shock protein are found in patients with periodontal disease. These antibodies to heat-shock proteins of periodontal bacteria are cross-reactive with the heat-shock protein that is exposed in an injured endothelium or atheromatous plaque. This could set in motion autoimmune phenomena and contribute to atheroma formation. There also may be common genetic mechanisms which provide the link between periodontal disease and cardiovascular disease.³

3. Prevalence

CVD is the leading cause of death in India, and its contribution to mortality is rising. It is estimated that approximately 46.9% patients with CVD in India are affected. According to the World Health Report of 2002, deaths due to coronary heart disease (CHD) in India rose from 1.17 million in 1991 to 1.59 million in 2000 and 2.03 million in 2010. In a survey conducted in 45 rural villages in India, 32% of all deaths were due to CVD. The mortality from common CVD is about 1.2 million ischemic heart disease and about 0.8 million stroke cases every year. Compared with all other countries, India suffers the highest loss due to deaths from CVD in people aged 35–64 years. The prevalence of CVD is reported to be 2–3 times higher in the urban population as compared to the rural population.⁴

4. Treatment objectives

- 1) Important goal of treatment to manage patients with cardiovascular diseases is to deal with all the identified risk factors involved.
- 2) Pre-medication should be considered to alleviate anxiety and effective analgesia is important to reduce stress.
- 3) Early and short morning appointments are advised for all such patients.
- 4) All the patients are allowed to attain a comfortable position in a dental chair.
- 5) Every effort should be made to keep procedure time down to a minimum, and treatment should be terminated early if the patient becomes overly anxious.
- 6) Current medications which the patients are taking and allergies to any drugs and also any potential drug interactions and side effects are noted.⁵

5. Dental management of hypertensive patients

The sequential treatment plan for hypertensive patients generally starts with consulting the physician regarding the

current medical status, medication, and patient management during periodontal therapy. Dentist must inform the physician regarding the estimated degree of stress, length of procedures, and complexity of the individualized treatment plan.

Following are the stages in management of hypertensive patients undergoing dental treatment.

Initial evaluation of each patient with hypertension should include detailed family history of cardiovascular disease, history of hypertension, medications, duration and antihypertensive treatment history, severity of disease, and its complications. Before starting dental treatment, dentist has to assess the presence of hypertension and accordingly the treatment changes needed. Patients with hypertension are at increased risk of developing adverse effects in a dental office. Therefore, measuring blood pressure (BP) will be done in the dental office to every new patient for each visit. In patients with chronic systemic diseases, BP measurement will be carried out during more complicated dental interventions as oral surgical procedures, restorative treatment complicated with longer sessions, placing dental implants, and periodontal surgery. Routine measurement of BP may reduce the risk of cardiovascular events and acute complications during dental treatment, especially when conscious sedation or general anesthesia is required. Whenever a dentist meets a patient with hypertensive crisis, the dental procedure should be postponed and the patient should be immediately sent to a hospital.⁶

6. Dental management of angina pectoris patients

Coronary heart disease is very common in the general population, and it is therefore likely that a dentist will meet such a patient in clinical practice. Treatment sequence should start with taking complete medical history followed by short morning appointments, premedication with anxiolytics or prophylactic nitroglycerin, nitrous oxide-oxygen sedation, and slow delivery of an anesthetic with epinephrine (1:1,00,000) coupled with aspiration.

Angina pain is often felt in the mandible, with secondary radiation to the neck and throat. Therefore, the patient may initially suspect the pain to be of dental origin. The dental environment increases the likelihood of an angina attack because of fear, anxiety, and pain. A patient who has an angina episode in the dental chair should receive the following emergency dental treatment:

Dental procedure is discontinued and Patient is allowed to attain a comfortable position. Patient is reassured and restrictive garments are loosened. Patient is encouraged to have his own NTG spray 1 or 2 metered sprays depending on his usual requirement (up to 3 doses of NTG spray can be given in 15 min). If angina signs and symptoms do not resolve with this treatment within 2–3 min, administer another dose of nitroglycerin, monitor the patient's vital signs, call his or her physician, and be ready to accompany the patient to emergency department. Oxygen is administered 4–6 lit/min. Dental procedure may be restarted if it is the usual type of experience for the patient. If no improvement within

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