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Hypertension and Prosthodontic Care

Dr. Ganaraj Shetty^{a*}, Dr. Kiran Kumar S.^b

^a A B Shetty Memorial Institute Of Dental Sciences ,Nitte University, Deralakatte Mangalore 575018

^b Madhu Hospital ,Magadi Main Road, Agrahara, dasarahalli, Bangalore, 560079, India

^aEmail: drganaraj@yahoo.co.in

^bEmail: kirankishan.s@gmail.com

Abstract

Hypertensive patients form a considerable portion of prosthodontic consultation. Inadequate precautions and poor management of such complications hinder patient compliance and effective outcome of the procedure. When equipped with thorough knowledge about hypertension, its complications and effects on prosthodontic procedures, one can successfully treat and hope for better prognosis. Seldom attention has been given in literature regarding effective management of such patients.

Keywords: Hypertension; Management; Prosthodontic Care;

1. Introduction

Hypertension is a highly prevalent cardiovascular disease worldwide [1]. Arterial hypertension (AHT) is an important health issue due to its high incidence and prevalence in the general population and the associated increase in risk of suffering cardiovascular disease in the form of angina, myocardial infarction and cerebrovascular events (e.g., stroke). With substantial number of people being elderly; the greying of the world's population is predicted to produce millions of individuals with systemic medical conditions that can affect oral health and dental treatment.

* Corresponding author.

E-mail address: drganaraj@yahoo.co.in.

The dental management of these hypertensive patients can be problematic in terms of oral complications, dental therapy and emergency care. One third of people with clinical hypertension are undiagnosed. Although more than 70% of hypertensive patients are aware of the disease, only 23–49% are treated and fewer (20%) achieving control [1]. It is important that the dentist be aware that a significant portion of their patients may have undiagnosed or poorly controlled hypertension.

Periodontitis is one of the most chronic infectious diseases. The oral cavity is an ideal breeding area for bacteria and those affected by periodontal disease are at an increased risk for potentially fatal bacteria entering the bloodstream via infected oral tissue. Hypertensive patients are at a higher risk of developing septicaemia following prosthodontic treatments [2,5].

The risk for a significant cardiovascular event is compounded by procedural stress or epinephrine exposure from local anaesthetic or other exogenous sources. Complications usually occur in the post-prosthodontic therapy period. Hence such procedures in hypertensive patients mandate thorough health check-up, necessary investigations and utmost precautions. Planning for dental treatment in the medically compromised patient primarily involves having an understanding of the nature of the patient's disease and how it can impact their physiology, his/her response to dental management and post dental treatment healing.

2. Discussion

Prosthodontic treatment approach in a hypertensive patient should be planned meticulously. History should cover specific aspects like the duration of hypertension, medication and patient compliance with regard to antihypertensives, other associated co-morbid conditions, current oral disease, past dental treatment including its outcome, complications during treatment and post-treatment medication. Accurate measurement of blood pressure is mandatory. Detection of hypertension in the office requires blood pressure measuring equipment that is functioning adequately and ideally validated. Additionally, the user must be regularly trained in a standardized measurement technique to ensure accuracy and consistency. The most preferred method is auscultation, with the patient seated calmly for at least 5-10 minutes with arm at the level of the heart, and feet on the floor and rather than lying down on a table. Activities like exercise, smoking and caffeine should be avoided at least 30 minutes prior to measuring of blood pressure, to avoid artificially high readings. It is important to have a proper sized BP cuff by ensuring at least 80% of the cuff bladder encircles the patient's arm. Two measurements should be recorded and the average of two should be taken. The initial step is manual palpation of the radial artery and inflation of the cuff pressure until the radial pulse cannot be palpated. The blood pressure cuff later deflated in slow 2 mmHg increments and the pressure at which palpation of the radial pulse is resumed, is the approximate systolic blood pressure. The stethoscope should be placed in the antecubital fossa, the cuff pressure is increased 20-30 mmHg mercury above the level of the estimated systolic blood pressure and again decreased at a rate of 2 mmHg while listening for the beginning and ending of the Korotkoff sounds which signify the systolic and diastolic blood pressure, respectively. In patients who present with problems identified at examination that have not previously been reported to a health care practitioner the dentist can be instrumental in defining potential pathology and making the appropriate referral for additional medical examination and evaluation. Such patients have to be referred for medical assessment prior to dental

treatment. In patients who are newly diagnosed with hypertension, dental treatment should be commenced only after consultation with the physician. Particular attention should be given for accurate measurement of blood pressure in pregnant women, since pregnancy may alter the patient BP values with more than 10% of pregnant women having clinically relevant hypertension. BP monitoring is also necessary in diabetic patients, patients with autonomous dysfunction, and elderly patients in whom orthostatic hypotension is a huge problem [3,6,9,10].

Prosthodontists should be aware of the oral manifestations caused by the adverse effects of antihypertensive drugs for successful outcome of the treatment. Many antihypertensive drugs like ACEIs, thiazide diuretics, loop diuretics, calcium channel blockers and clonidine are associated with xerostomia. Hyposalivation was also found as one of the clinical manifestations in hypertensive patients. This hyposalivation was related to the sustained increase in both systolic as well as diastolic blood pressure and also in patients who were under antihypertensive medication especially with diuretics. The unstipulated salivary flow will be reduced. Xerostomia has many consequences like decay, difficulty in chewing, swallowing and speaking, candidiasis and oral burning syndrome [4,10].

Lichen planus like lesions or lichenoid reactions are white lesions characterized by linear striations occurring on the buccal mucosa [8]. They are seen bilaterally and usually posteriorly. These are sometimes seen in hypertensives as a manifestation secondary to the use of the medication. The drugs commonly causing this side effect are the ACE inhibitor drugs especially the captopril. Such lesions are characterized by acanthosis, basal cell degeneration, hyperparakeratosis, numerous chronic inflammatory cell infiltrates throughout the connective tissue especially the plasma cells and histiocytes [10].

Gingival hyperplasia is also one of the most common clinical findings in patients with hypertension taking anti-hypertensive medication especially calcium channel blockers like nifedipine. Gingival hyperplasia manifests as pain, gingival bleeding, and difficulty in mastication. By changing antihypertensive medication hyperplasia can be reversed. Gingival bleeding was one of the common clinical features seen in hypertensive patients and Mailboridin and his colleagues studied the micro lymphohemocirculatory bed and leucocytogram of gingival tissue by the light microscopy in patients with chronic periodontitis having normal and high arterial blood pressure. In majority of the cases of arterial hypertension the gingival mucous was characterized by widening of lymphatic vessels and interstitial spaces [10]. In cases of arterial hypertension combination with inflammatory reaction the tendency for widening of lymphatic vessels and interstitial spaces persisted compared to the normotensives. It testifies to the high probability of lymphogenic generalization of inflammation. Besides, in cases of inflammatory gingival pathology in arterial hypertension the absolute neutrophil number was significantly higher showing far more acute inflammatory processes and greater volume of tissue involvement. Thus, concluding that the increased periodontitis in hypertensives could be probably attributed as one of the manifestations of hypertension [4].

Maxillofacial region is a powerful reflexogenic zone and needs adequate anesthesia supplement. Pain dramatically increases the complications in hypertensive patients. It is preferable for the visits to be brief and in the morning. The prescription of anxiolytic agents may prove necessary in particularly anxious patients (5-10

mg of diazepam the night before and 1-2 hours before the appointment) before dental treatment. A good local anaesthetic technique should be performed, taking utmost care to avoid intravascular injection and using a maximum of two anaesthetic carpules with vasoconstrictor. If more anaesthesia is needed, it should be provided without vasoconstrictor. Absorbable sutures are to be avoided with adrenaline [3]. Extra care should be taken about the drug interactions between antihypertensives and drugs used in dentistry. Most antihypertensive drugs have drug interactions with LA (local anaesthetic) and analgesics. LA toxicity may be increased by interaction of LA with nonselective beta-blockers. The cardiovascular effects of epinephrine used during dental procedures may be potentiated by the use of medications such as nonselective beta-blockers (propranolol and nadolol). Guidelines recommend decreasing the dose and increasing the time interval between epinephrine injections. LA with vasoconstrictor should be avoided or used in low doses in patients taking nonselective beta-blockers or in patients with uncontrolled hypertension [3,5,6].

The antihypertensive effect of diuretics, beta-blockers, alpha blockers, vasodilators, ACE inhibitors may be antagonized by the long-term use of NSAID [4]. Certain nonsteroidal anti inflammatory drugs, such as ibuprofen, indomethacin or naproxen, can interact with antihypertensive drugs (beta-blockers, diuretics, ACEI), thereby lowering their antihypertensive action [3,7].

Due to higher concentrations of epinephrine (almost 12 standard cartridges) in gingival retraction cords used for prosthetics impressions and its rapid uptake in circulation, the use of epinephrine for gingival eviction in patients with cardiovascular disease is contraindicated. Hypertensive patients are at an increased risk of developing complications like bleeding and delayed post operative wound healing. Certain precautions can avoid such complications and promote successful outcome of the procedures [13].

Fabricating a complete denture demands utmost care to avoid causing soft tissue abrasion. Certain antihypertensive drugs are associated with xerostomia which in turn hamper the retention and stability of the complete dentures [6]. For denture wearers, denture adhesives and artificial saliva may aid in the retention of the prostheses. In such patients artificial salivary lubricants should compensate the effect of xerostomia for better post-therapy results [8,12].

The sharp edges of the removable partial dentures should be trimmed off. Removable partial denture should be polished well and preferably should be fabricated with flexible material [11].

The risk of bleeding secondary to accidental pulp exposure is observed to be absent in patients undergoing root canal therapy prior to tooth preparation. To minimize gingival bleeding, the margins of the preparation should be kept supragingival. During treatment, sudden changes in the body position should be avoided, as they can cause orthostatic hypotension as a side effect of the antihypertensives [4,7]. Prolonged presence of xerostomia is conducive to greater carious activity and is therefore extremely hostile to the margins of cast metal or ceramic restorations. It is mandatory to educate the patients about good oral hygiene and also to maintain the prosthesis clean [4].

3. Conclusion

While providing prosthodontic care to the patients with hypertension, understanding the disease, its treatment and its impact on the patient's ability to undergo and respond to dental care is mandatory. It is highly recommended to choose dental treatment alternatives as conservative and as minimally invasive as possible to reduce the risks along the entire dental treatment. With an increase in awareness of the availability of various prosthodontic treatments, the number of patients seeking consultation has tremendously increased. Hypertensive patients no longer form a negligible portion of the consultation. When equipped with thorough knowledge about hypertension, the drug interactions, the expected complications, the probable causes of treatment failure and the mandatory precautions to be taken during such treatment, prosthodontists can hope for better results. Cautious approach and appropriate precautions when taken by the prosthodontists in hypertensive patients can go a long way in providing quality dental care.

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