Abstract

Hypertension is one of the most frequently encountered systemic diseases in patients visiting the dental clinics, due to its high prevalence worldwide. It has been attributed to approximately 7.1 million deaths per year, having a prevalence of approximately 1 billion. While managing a hypertensive patient in the dental office, the dentist must take efforts to perform the dental procedures with optimum pain control, stress and anxiety reduction. Administration of dental local anaesthesia with epinephrine in these patients is considered risky. This article highlights the precautions to be taken during management of a hypertensive patient in the dental office. Furthermore, it is cardinal that the dentist should master the protocols of treatment and management of complications in hypertensive patients.

INTRODUCTION

Hypertension, defined as a systolic blood pressure (SBP) ≥ 140 mm Hg, diastolic blood pressure (DBP) ≥ 90 mm Hg requiring antihypertensive medication, [1] is a worldwide concern, responsible for approximately 7.1 million deaths per year, with a prevalence of approximately 1 billion cases. [2] It is one of the most frequently encountered systemic diseases in patients visiting the dental clinic, due to its high prevalence worldwide. [3] A high blood pressure is a proven risk factor for cardiovascular, heart failure, stroke, and renal (kidney) diseases. [4]

DIAGNOSIS OF HYPERTENSION

Hypertension can be diagnosed by measuring patient’s blood pressure, which may considerably minimise the risk of cardiovascular diseases to a fair level. [5] The changes in hypertension prevalence have been reflected in the decreased morbidity and mortality associated with hypertension. The dental procedures for hypertensive patients are not much affected if the respective disease is under control. Dentistry must be pertained about the adult patients with hypertension. Determination of blood pressure for dental and dental hygiene patients is an essential step in the assessment phase of care. According to the Seventh Report of the Joint National Committee on the Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC7), patients are considered hypertensive if their systolic pressure is equal to or exceeds 140 mmHg, if their diastolic pressure is greater or equal to 90 mmHg, or if they are taking antihypertensive medication.

The first step in the dental hygiene process of care is assessment, which includes gathering of pertinent information - such as vital signs (blood pressure, pulse, and tobacco use) – extra- and intra-oral tissue examinations, and performing of dental and periodontal chartings). [6] Detection of hypertension in the office requires the utilization of inspected and ideally validated blood pressure measuring equipments. The blood pressure of patients with documented hypertension is assessed at each dental visit, because failure to detect severe elevations of blood pressure can result in stroke or myocardial infarction during complex dental procedures.

GUIDELINES FOR THE DENTAL PRACTITIONER

Reduction of stress and anxiety

While managing a hypertensive patient in the dental office, the dentist must take efforts to perform the dental procedures with optimum pain...
control, reduced stress and anxiety. Effective control of operative and postoperative pain after surgical, periodontal, or other dental procedures is one of the most important things the dentist can do to minimize blood pressure elevation in the patient with hypertension. [7] Stress and anxiety can further raise blood pressure. The reduction of stress and anxiety possibly involved in dental treatments is another vital area for the dentist in managing a hypertensive patient. The initial step in stress and anxiety reduction is building an ancillary relationship with the patient. Also, the patient should be motivated to ask questions. He should be made aware of the treatment plan and execution during his first visit. It is the duty of the dentist to respond to patients query in an honest and humble manner.

If the patient is to experience some discomfort during the dental procedure, the dentist has to intimate at what point this will occur. If not, this may result in increased anxiety and discomfort for both operator and patient.

Very anxious patients can be given a small dose of diazepam (5 mg) or shorter-acting benzodiazepines, such as oxazepam (30 mg) the night before and 1 hour before the dental appointment. [7]

**Precautions before administration of local anaesthesia**

Administration of dental local anaesthesia with epinephrine in these patients is considered risky because of the beta-1 effects of epinephrine on the heart, and of the beta-2 effect on skeletal muscle blood vessels - which might result in increased blood pressure and pulse rate. [8] Literature reveals that the use of dental local anaesthesia containing epinephrine in hypertensive patients - two 1.8 ml cartridges of lignocaine containing 1:100,000 epinephrine (0.036 mg) - assures a safe control in patients with hypertension and stage 1 hypertension (HTN-1) (BP 159/99) (Table 1). [9] Researchers evoke that in stage 2 hypertension (HTN-2) patients (BP > 160/100mmHg), (Table 1), the local anaesthesia containing epinephrine can be administered with appropriate precautions and care. [8]

To perform a safe dental extraction, the dentist has to adhere to the following guidelines. The appointments can be minimized and preferably planned in the morning. Blood pressure should be monitored before and after the administration of local anaesthesia. Nitrous oxide may be beneficial in controlling anxiety, however rebound hypotension may result if inadequate oxygenation (hypoxia) occurs. [7] Preoperative reassurance with the use of effective local anaesthesia (with or without epinephrine) may help in alleviating the related anxiety and thus reduce the chances of increased blood pressure. Use of oral sedatives the night before or during the procedure (pharmacosedation) is also considered as effective. About 40% of the hypertensive patients do have raised levels of circulating catecholamines, leading to an abnormal sympathetic activity. [10] Consequently, the use of local anesthesia with vasoconstrictor to 0.036 - 0.054 mg of epinephrine (2-3 cartridges of 2% lidocaine with 1:100,000 epinephrine) per visit in risk patients should be minimised. The risky patients should be advised to seek medical attention, during the dental treatment.

**Life Style Modifications**

Other factors that may precipitate hypertension include high salt diet, obesity, and excessive alcohol intake. Life style modifications do actively influence the treatment of hypertension. These modifications include increased physical activity, reduced salt intake to less than 6 g per day, and limited alcohol intake. Studies showed that a low sodium diet had a 25% risk reduction in future cardiovascular events. [11] Patients with HTN are considered as highly risky groups when administering dental local anaesthesia containing a vasoconstrictor, because of the potential to undergo sudden, epinephrine-induced dramatic increase in blood pressure, leading to life-threatening hypertensive crises. [9] It is widely recommended that epinephrine-containing local anesthetics should be limited to one to three cartridges of 2% lidocaine with 1:100,000 epinephrine, safely administered to hypertensive patients. [7]
CONCLUSIONS

Dentistry has played a cardinal role in the detection of patients with hypertension. Patients suspected to have high blood pressure should be referred to medical diagnosis. In the dental office, medical emergencies do occur, but the dental practitioner needs to be aware and permanently informed on the treatment and management of complications. The dentist has to be prepared to overcome the medical emergencies, until the patients recover. However, with a well-established initial diagnosis and an appropriate treatment, hypertension can be treated. Still, as dentists, we should also incorporate active interest in patients’ general health and improve their standard of well being. Therefore, it is mandatory that complete medical and dental history should be known by the dentist before the execution of any dental procedure. An early detection of hypertension by the dentist can lead to a prompt treatment in the dental office.

Table 1 Classification of blood pressure findings

<table>
<thead>
<tr>
<th>Category</th>
<th>SBP (mm HG)</th>
<th>DBP (mm HG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimal</td>
<td>&lt;120 and</td>
<td>&lt;80</td>
</tr>
<tr>
<td>Normal</td>
<td>&lt;130 and</td>
<td>&lt;85</td>
</tr>
<tr>
<td>High-normal</td>
<td>130-139 or</td>
<td>85-89</td>
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<tr>
<td>Hypertension</td>
<td></td>
<td></td>
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<tr>
<td>Stage 1</td>
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<td>90-99</td>
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<td>Stage 2</td>
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<td>100-109</td>
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<tr>
<td>Stage 3</td>
<td>≥ 180 or</td>
<td>&gt; 110</td>
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References