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Volume 9:3, 2020
DOI: 10.37421/jhoa.2020.9.266

Journal of
Hypertension: Open Access

ISSN: 2167-1095 Open Access

Hypertension and Dentistry

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Abstract

Hypertension has become a common word in day to day life .In today's world 1.13 billion people have hypertension (2/3 living in low and middle income countries).Being a dentist it is important to have thorough knowledge about HBP to avoid complication, during dental treatment and post operatively.

Keywords: Hypetension • Dentistry

Introduction

What is Hypertension (HBP)?

- High Blood pressureis the serious medical condition in which the force of the blood against the artery wall is too high that significantly increases the risk of heart ,kidney, brain diseases. In definition we can say that it is persistently raised blood pressure resulting from raised peripheral arteriolar resistance. Blood pressure withSystolic >140 mm Hg & diastolic >90 mm Hg is called a hypertensive patient.
- High blood pressure that is not due to another condition or disease is called **Primary or Essential hypertension**. Secondary hypertension is caused by specific diseases also we can say it is a complication of other medical condition. In 90% cases it is Primary hypertension, 10% cases are of secondary hypertension in nature lead by Diabetes ,Renal diseases, Pregnancy, Endocrine disorders.
- The AHA 2017 guidelines define the following ranges of blood pressure (Table 1)

Sign and Symptoms

It would right to call it as "THE SILENT KILLER". Because person with hypertension may not experience any symptoms and it silently affect the vital organs with long course of time but in some there is Early morning headache, Sweating, Anxiety, Nosebleed, Irregular heart rhythm, Buzzing in ears, Vision changes.

General management

It includes minimizing the risk factors associated with HBP

Table 1: Summary of the Different types of Hypertension.

	Systolic (mmHg)	Diastolic (mmHg)
Normal blood pressure	Less than 120	Less than 80
Elevated	Between 120 and 129	Less than 80
Stage 1 hypertension	Between 130 and 139	Between 80 and 89
Stage 2 hypertension	At least 140	At least 90
Hypertensive crisis	Over 180	Over 120

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Received 29 June 2020; **Accepted** 01 August 2020; **Published** 03 August 2020

Table 2: Different type of Drugs.

Targeting renin–angiotensin system	
Angiotensin-converting enzyme inhibitors	Captopril, lisinopril, ramipril
Angiotensin receptor antagonists	Candesartan, losartan, valsartan
Direct renin antagonists	Aliskiren
Adrenoceptor antagonists	
β-Blockers	Atenolol, metoprolol, propranolol
α-Blockers	Doxazosin, labetalol (also a β-blocker), phentolamine, phenoxybenzamine
Calcium channel blockers	
Phenylalkamines	Verapamil
Dihydropyridines	Amlodipine, nifedipine, nimodipine
Benzothiazepines	Diltiazem
Diuretics	
Thiazides	Bendroflumethiazide, hydrochlorothiazide
Loop	Furosemide, bumetanide
Potassium sparing/aldosterone antagonist	Amiloride, spironolactone
Vasodilators	Hydralazine, minoxidil
Centrally acting agents	Clonidine, methyldopa
Ganglion block	Trimetaphan

- Stress relief by taking good sleep and rest with healthy life approach
- Weight and diet control
- Stopping of smoking and alcohol
- Exercise
- Specific antihypertensive therapy

Significance of Hypertension in Dentistry

- Most of the time dentist plays a significant role to diagnose undetected hypertension in dental clinics during their diagnosis and treatment planning
- Because of high prevalence of this disease and no. of medication used in the treatment, dentist should have thorough knowledge of hypertensive drugs interaction and it's effect on oral and general health of the patient.
- One adverse effect of significance of hypertension seen in dental clinic is postural hypotension seen with patients taking prazocin or terazocin(alpha receptor blockers), thiazides and furosemide, monitoring of the patients getting out of the dental chair, therefore becomes essentials. Raise pateints slowly from supine, raising suddenly may result in postural hypotention/loss of consciousness.

- Patients on ACE inhibitors shows problems of dry cough during the dental treatment which affect the dental treatment success. (dry cough possibly the result of accumulation of bradykinin,in the bronchial mucous) it is not dose related and more frequently in women than in men. once ACE Inhibitors are stopped, the cough disappears usually within a week.
- Dental surgery without taking consideration of hypertension management could end to medical emergency and fatality.

Oral Manifestation of Side/Adverse Effect Of Hypertensive Drugs

Gingival hyperplasia

It is an overgrowth of gum tissue around the teeth. It is a symptoms of poor oral hygiene and /or side effects of certain drugs . it can be localized or generalized . Drug induced GH generally onset within 3 months ,there is change in the gingival contour leading to modification of gingival size.In a research among the gingival hyperplasia patients using antihypertensive drugs 71.1% were taking calcium channel blocker, 21.5% were taking ACE Inhibitors, and 7.4% were taking beta-blockers.

Xerostomia means dryness of oropharyngealmucosa due to decreased salivary secretion and is manifested as subjective sensation of dry mouth. Certain diseases like tuberculosis, Sjogren'ssyndrome, Diabetes, Cancer chemotherapy and Radiation therapy, certain drugs like Tricyclic antidepressant ,antihistamines, antipsychotis drugs, antiparkinsonian drugs, antihypertensive drugs like clonidine, other factors including old age, smoking, mouth breathing.

Antihypertensive drugs causing xerostomia are clonidine, α-methyldopa and prazocin.

Dry Cough

Patients on ACE inhibitors show problem of dry cough during the dental treatment which affect the dental treatment success. A dry cough possibly the result of accumulation of bradykinin in the bronchial mucosa. It is not dose related and occur more frequently in women then in men. once ACE inhibitors are stopped the cough disappears usually within the week.

Lichenoid reaction

Lichen plants is a skin rash triggered by the immune system. Sometimes in reaction to a medication and called a lichenoid drug eruption, or drug-induced lichen plants. If the reaction occurs inside your mouth, it's called oral lichenoid drug eruption Oral lichen plants and oral lichenoid drug reactions have similar clinical and histologic findings. The onset of oral lichenoid drug reactions appears to correspond to the administration of medications, especially antihypertensive drugs, oral hypoglycemic drugs, antimalarial drugs, gold salts, penicillamine and others. The oral manifestation showed radiated white lines with erythematous and erosive areas. The patient experienced pain and a burning sensation when eating spicy food. A tissue biopsy was carried out and revealed the characteristics of lichen plants. The patient was treated with 0.1% fluocinoloneacetonide in an orabase as well as the replacement of the oral hypoglycemic and antihypertensive agents. The lesions improved and the burning sensation disappeared in two weeks after treatment.

Medications commonly reported to trigger a lichenoid drug eruption. Antihypertensives–ACE inhibitors, Beta-blockers, Nifedipine, Methyldopa. Diuretics –hydrochlorothiazide, Frusemide, Spironolactone [1].

Taste alteration

Angiotensin-converting enzyme inhibitors (notably captopril Capoten) are among the medications most commonly associated with taste disturbances, including decreased sense of taste (hypogeusia) and a strongly metallic, bitter or sweet taste.

Because diuretics prompt the kidneys to remove water from the body, they can make the mouth dry. The potassium-sparing diuretic amiloride can cause a persistent bitter taste. Fortunately, changes in taste are not as common with the most frequently used diuretics, hydrochlorothiazide and chlorthalidone [2].

Antihypertensive drug interaction during dental treatment

NSAID (Aspirin and Indomethacin in particular) reduce the anti hypertensive effects of ACE inhibitors by blocking bradykinin mediated vasodilatation.

NSAID inhibit the diuretic effects of Thiazides and loop Diuretics and Antagonize the antihypertensive effect of β-Blockers.

Use of guanethidine (An adrenergic neuron blocker and an antihypertensive drug) on long term basis produces the sensitivity to an exogenously administered epinephrine as present in local anaesthetic injection results in hypertension and cardiac arrhythmias

Non selective β-Blockers (propranolol) or mixed αand αBlockers may rather enhance the pressure response to vasoconstrictor epinephrine resulting in hypertension [3].

Avoid giving cephalosporin in dental infection cases to the patients on loop diuretics as it may increase the risk of renal toxicity of the cephalosporin secreted through kidneys.

Dental management

- First and most important step is to take patient complete medical history,family background (tells us about Hereditary diseases), and work status(to know about work stress and socioeconomic status). Diagnosis and treatment planning is the first and most important step towards dental treatment to ensure successful treatment.
- Try to comfort the patient and avoid anxiety & pain because endogenous epinephrine release may induce dysrhythmias
- Fix the appointment in afternoon as patients best treated in afternoon when endogenous epinephrine peak is less.
- Raise the patient slowly from supine, raising suddenly may result in postural Hypotention/loss of consciousness if patient is on Thiazides, Furosemide.
- Adequate analgesia to be provided to ensure painless treatment
- Aspirating syringe to be used to give LA to avoid injection in blood vessel and aspirate before depositing the anesthesia locally.
- Epinephrine can be used in combination with LA unless systolic BP is over 200 mmHg and/ diastolic over 110 mmHg.
- Conscious sedation may be advisable.
- Epinephrine containing LA not to be given in high doses in patients on beta blockers to avoid drug interaction & induction of hypertension and cardiac complication
- Always measure the blood pressure 2 -3 times with three to five minute time interval to ensure accuracy as there is a condition called white coat hypertension in which there is high reading of blood pressure when measured in medical and/or dental environment because of anxiety of patient.

Preoperative management

It is rightly says "Prevention is better than cure "so to prevent any complication during the treatment it is advisable to follow the protocol to ensure patient safety.

Take blood pressure reading 2-3 times with three to five minute time interval before dental treatment.

- Check for potassium deficiency preoperatively. Chronic

administration of diuretics (furosemide) lead to potassium deficiency. which may result in dysrhythmia.

- Diuretics should be stopped 1 day before the surgery.
- Administration of lignocaine without epinephrine. Ensure aspiration before depositing LA locally.

Postoperative management

- Ensure adequate BP to maintain tissue perfusion.
- In chronically hypertensive patients tissues become adapted to raised blood pressure & fall in BP would be fatal.
- Avoid excess IV Fluids.

Summary

High blood pressure is a body response to our change in healthy life style,our disease and drug status and our habits which not only affect medically but has direct and indirect manifestation on oral health. As a dentist we generally encounter these patients in our dental clinic and thorough knowledge of hypertension is the only tool to ensure patient well being and success of dental treatment. Being a dentist it is our responsibility to know hypertensive patient management with thorough knowledge of drugs interaction and to manage hypertension crisis

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How to cite this article: Dr. Bindu Bisht. "Hypertension and Dentistry". *J Hypertens (Los Angel)* 9 (2020) doi: 10.37421/jhoa.2020.9.266