

*Original Research***Prevalence of Hypertension in Patients Visiting for Dental Treatment: A Cross Sectional Study.**

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Abstract: Objective: Hypertension is one of the cardiovascular diseases which have been reported as one of the common cause of death. Hypertension could alter the course of oral disease; modify dental treatment and response to such treatment. This was to determine the prevalence of hypertension among dental patients and their common oral complaint. **Material & Method:** Measurement of the blood pressure of all the patients aged 18-70years who were attending the dental clinic was carried out using sphygmomanometer and stethoscope. **Results:** Out of 2000 patients reported to the dental OPD 611(30.55%) were detected of hypertension. Out of these diagnosed case of hypertension 256(41.8%) were aware of the hypertension problem and 355(58.1%) were detected of hypertension during dental examination in the dental OPD. Dental examination revealed various dental problems in these hypertensive patients, with highest prevalence of apical periodontitis in 28.64% patients followed by chronic marginal gingivitis in 24.54% and tooth mobility in 22.2%. **Conclusion:** Some dental patients were unaware of their blood pressure levels. It is important for all the dental patients to be screened for hypertension to avoid the complications.

Keywords: Hypertension, Glomerulonephritis, Diagnosis, Periodontitis

INTRODUCTION

People now have a longer expectancy, due to the improvements in health science. With increasing age, people tend to develop more systemic diseases and oral health problems. Patients visiting dental clinics may have systemic medical conditions and are on medication or without medication.¹ Hypertension is one of the cardiovascular diseases which has been reported as one of the common cause of death worldwide.¹ Hypertension is defined as abnormally high blood pressure (more than 120/80mm Hg) in the arteries.²

Hypertension is divided into two types:²

1. Primary hypertension (Essential hypertension)
2. Secondary hypertension (Non-essential hypertension)

1. Primary Hypertension: It results when arterial blood pressure is increased due to increased peripheral resistance. It is further divided in to two types namely: benign and malignant hypertension:-

- **Benign hypertension:** There is a moderate increase in blood pressure with systolic pressure of 200 mm Hg and the diastolic pressure of above 100 mm Hg. However, in resting condition and sleep, the blood pressure returns to normal level. Later, if there is increase in blood pressure

it will not come back to normal level in resting conditions.²

- **Malignant hypertension:** The blood pressure elevated to a great extends of about 250 mm Hg of systolic pressure and 150 mm Hg of diastolic pressure. It produces severe symptoms like renal disease, retinal disease, and being a fatal disease, it causes death within few years. Some of the characteristics of primary or essential hypertension are:²

- a) The mean arterial pressure is increased 40-60 %.
- b) The renal blood flow in the later stages is decreased about one half of normal.
- c) The resistance to blood flow through the kidney is increased 2-4 fold.
- d) The kidneys will not excrete adequate amounts of salt and water unless the arterial pressure is high.

2. Secondary Hypertension: The different forms of secondary hypertension are:-²

- **Cardiovascular hypertension** is produced due to:
 - a) Atherosclerosis- hardening and narrowing of blood vessels.
 - b) Co-arctation of aorta- narrowing of aorta.
- **Renal hypertension** is produced due to:
 - a) Stenosis renal arteries- narrowing of one or both renal arteries, so that the renal function is impaired.

b) Glomerulonephritis- nephritis with inflammation of the capillary loops in the renal glomeruli.

- **Endocrine hypertension** occurs due to:

a) Pheochromocytoma- tumor in adrenal medulla.

b) Hyperaldosteronism- excess secretion of aldosterone from adrenal cortex Conn's syndrome. c) Cushing's syndrome- excess secretion of cortisone.

d) Gigantism or Acromegaly- excess secretion of growth hormone.

- **Neurogenic hypertension** can be caused by strong stimulation of the sympathetic nervous system:

a) Section of the baroreceptors nerves.

b) Lesions in tractus solitarius.

c) Increased intracranial pressure.

Hypertension can be diagnosed by measuring a patient's blood pressure and once detected, treatment methods have reduced the risk of cardiovascular diseases and fatality to a reasonable level.³ Since many patients do not routinely take their own blood pressure readings, hypertension often goes unnoticed and some of the hypertensive patients on dental treatment may not be controlled.³ Adult patients with pre-hypertensive and are at increased risk of progression to hypertension have been reported. This therefore makes the measurement and monitoring blood pressure for these patients mandatory. Some medical conditions including hypertension could alter the course of oral diseases.³ Since some of the dental patients may be unaware of their blood pressure levels and the fact that a dental setting is viewed as a stressful environment, makes it more important for all dental patients to be screened for hypertension. The stress of a dental visit may artificially raise the blood pressure induced by the anticipation and actual dental treatment.^{3,4} This study became necessary because of the increasing number of hypertensive patients detected at the dental clinic. The study objective was to determine the prevalence of hypertension among dental patients and their common presenting oral complaints.

MATERIAL & METHODS

This study was carried out at the Rama University, Faculty of Dental Sciences. Patient with age of 18-80years that came to Dept of Oral Medicine and Radiology department during July 2014 to Jan 2016 were included. The aim of the study was to find prevalence of hypertension in patients reporting to the dental OPD and thereby help in imparting awareness of hypertension among the patients. Hospital's ethical committee provided the ethical approval for the study. The study criteria were explained to the patients and only those who agreed were allowed to participate with signed consent form. Determination of blood pressure levels was carried out using sphygmomanometer and stethoscope with the patient in a comfortable sitting position.

The blood pressure measurement was carried out on the patient's first visit. All known hypertensive were noted, their blood pressures were measured, and recorded. Blood pressure measurements were repeated when the patient was less anxious so as to minimize the contribution of fear/anxiety of dental treatment to the increase of blood pressure. Examination of dental structures was carried out on the Dental chair using the Dental examination set and standard Dental lighting. Diagnosis of the patient's Dental condition was made and patients were referred to specialized departments for treatments. Patient's whose blood pressure levels remained above 120/80 mm of Hg was considered hypertensive while those whose levels were below 120/80 but above 110/70 were recorded as normal. Analysis of all stored and collected data was done using simple frequencies and percentage.

RESULTS

A total of 2000 patients were examined in dental OPD and were included as the study group for the present study. Out of these 2000 patients 1200 (60%) were males and 800(40%) were females as depicted in Table 2. The study group was further categorized according to the age into 18-30; 31-40; 41-50; 51-60 and 61-80years and is represented in Table 3. Out of the total dental patients in the study group 611 were diagnosed of hypertension and they form the study (case) group and remaining 1389 that were non hypertensive formed the control group and is

depicted in Table 1. On recording the medical history of the 611 diagnosed cases of hypertension, 256(41.8%) were aware of the hypertension problem and 355(58.1%) were detected of hypertension during dental examination in the dental OPD.

Table 1: Incidence of Normotensive vs Hypertensive patients.

| Study groups | Total subjects n(%) |
|------------------------|---------------------|
| Normal (Control group) | 1389 (69.45%) |
| Hypertensive group | 611 (30.55%) |
| Total | 2000 (100%) |

According to the gender 495(81%) males and 116(18.9%) females were diagnosed of hypertension as shown in Table 2. Depending upon the age 295(48.2%) patients was in the age range of 41-50years followed by 120 (19.6%) in the age group of 51-60years and 116 (18.9%) in the age range of 61-80. The least were reported in the age range of 18-30 years (4%) followed by 31-40years (9%) as shown in Table 3.

Table 2: Gender based distribution of Hypertension in patients.

| Sex | Total subjects n(%) | Control group n(%) | Hypertensive group n(%) |
|--------------|---------------------|--------------------|-------------------------|
| Male | 1200 (60%) | 705 (50.7%) | 495 (81.01%) |
| Female | 800 (40%) | 684 (49.3%) | 116 (18.99%) |
| Total | 2000 (100%) | 1389 (100%) | 611 (100%) |

Table 3: Age based distribution of Hypertensive patients.

| Age (years) | Control group n(%) | Hypertensive group n(%) |
|--------------|--------------------|-------------------------|
| 18-30 | 515(37%) | 25 (4.09%) |
| 31-40 | 104(7.4%) | 55 (9.00%) |
| 41-50 | 170(12.2%) | 295 (48.29%) |
| 51-60 | 300(21.5%) | 120 (19.63%) |
| 61-80 | 300(21.5%) | 116 (18.98%) |
| Total | 1389 (100%) | 611 (100%) |

Various oral and dental problems were detected in the study group and are presented in Table 4, with the highest prevalence of apical periodontitis 28.64% followed by chronic marginal gingivitis 24.54%, tooth mobility 22.2%, dental caries 23.7% and lastly pericoronitis in 0.8%.

Table 4: Clinical presentation of hypertensive patients.

| Oral disease | Total subjects n(%) | Control group n(%) | Hypertensive patients n(%) |
|-----------------------------|---------------------|--------------------|----------------------------|
| Chronic Marginal Gingivitis | 625 (31.25%) | 475 (34.1%) | 150 (24.54%) |
| Pericoronitis | 15 (0.75%) | 10 (0.71%) | 05 (0.80%) |
| Apical Periodontitis | 425 (21.25%) | 250 (17.9%) | 175 (28.64%) |
| Tooth Mobility | 375 (18.75%) | 233 (16.7%) | 136 (22.25%) |
| Caries | 560 (28%) | 415 (29.8%) | 145 (23.73%) |
| Total | 2000 (100%) | 1389 (100%) | 611 (100%) |

DISCUSSION

The study was conducted because of the number of individuals who suffer from hypertension and the fact that the dental setting is viewed as a stressful environment for some individuals. The combination of high blood pressure and a stressful environment may have harmful, even fatal consequences for patients.^{2,4,5} The prevalence of hypertension among the 2000 dental patient reporting to the dental OPD was 611(30.55%) and remaining 1389(69.45%) were normotensive. Out of these diagnosed case of hypertension 256(41.8%) were aware of the hypertension problem and 355(58.1%) were detected of hypertension during dental examination in the dental OPD.

Many studies show that females are affected more with hypertension as compare to males^{4,5} but in the present study out of 2000 patients 495 (81.01%) were hypertensive male and 116(18.99%) were female hypertensive. This suggest that males are equally at risk of hypertension as of females.^{3,5,6}

Patient aged in the range of 41-80 years were affected most with hypertension. Many studies have reported that blood pressure tend to increase with age of patients.^{3,7} Elderly patients had a tendency to combine hypertension and with hypertension related diseases.^{6,8} Patients who are hypertensive are at risk each time they are treated without thorough examination, medical history and current blood pressure levels.³

In the present study 23.73% (145) were suffering with caries while 28.64% (175) of the patients were diagnosed to have apical periodontitis and tooth mobility 22.25% (136) as a common clinical presentation. Apical periodontitis on its own can be stressful and there for make a patient susceptible to an increase of an already elevated blood pressure with its attendant complications.³

It is important for oral health care provider to be aware of the actions, interactions and adverse effects of the drugs the patients are on for the treatment of hypertension because of the dental considerations of these drugs.^{3,8,9,10}

CONCLUSION: The practice of medicine and dentistry has been changing and will continue to change in the future. Dentists are increasingly treating more medically complex patients who require complex services with more challenging dental treatment planning. It appears that hypertension is currently under-diagnosed in the Indian population and inadequately treated in many of those detected. Some dental patients who were hypertensive were unaware of their blood pressure levels at the time of presentation to the dental clinic. Levels of detection of hypertension need to be improved since early detection and treatment would help to avoid the complications that may arise from dental treatments of these patients. The prevalence of hypertension, often undiagnosed or uncontrolled justifies routine blood pressure screening of dental patients as well as to educate dental patients about anxiety control.

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