



## COEXISTENCE OF HYPERTENSION AND OTHER VARIABLES IN ORAL AND MAXILLOFACIAL CLINIC

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### ABSTRACT

**Background:** Hypertension is quite important in oral and maxillofacial settings as it may present as an emergency during treatment or may necessitate a modification in the patient's management

**Objective:** To determine the importance of routine blood pressure measurement and determine the relationship of hypertension with specific maxillofacial disease conditions.

**Subjects and methods:** This was a prospective survey of patients who attended oral and maxillofacial clinic in University of Uyo Teaching hospital Uyo. A total of 116 patients who were found to have elevated blood pressure were assessed. An equal number of patients without elevated blood pressure was also assessed for comparison.

**Results:** In those with hypertension, the age ranged between 18 and 77 years with a mean age of  $40 \pm 11.0$  years. Females represented 38.79% (n = 45) and males 61.21% (n = 71) of the total study group. Prehypertension was present in 23.28% (n=27), while Stage 1 hypertension was present in 45.14% (n=57), and Stage 2 in 27.59% (n=32) of the patients. Odontalgia was recorded as the condition with the highest frequency of hypertension with 29.31% (34) closely followed by trigeminal neuralgia with 24.14% (28).

**Conclusion:** The high prevalence of hypertension observed in this study without prior knowledge of the patients is worrisome considering the potential consequence during procedures. Also, some of the disease conditions particularly odontalgia and trigeminal neuralgic pains may have direct association with hypertension, although the one that preceded the other could not be determined from this study.

**Keywords:** Hypertension, Pain, Blood pressure, Systolic, Diastolic.

### INTRODUCTION

High Blood Pressure (HBP) also referred to as hypertension is a major risk factor associated with cardiovascular diseases. It is often called the 'silent killer' because of this risk.<sup>1,2</sup> Many hypertensive individuals are unaware of their condition because they do not routinely take their BP readings.<sup>1</sup> Studies carried out on the general population have

reported the prevalence of hypertension to be high, ranging from 12.4 to 34.8% in Nigeria.<sup>3</sup> This high prevalence and the fact that it is largely undiagnosed in many individuals may have serious implications in patients, such as myocardial infarctions or stroke in the clinic due to fluctuations in their BP.<sup>4</sup> Ojehanon et al, found a prevalence of hypertension among dental patients to be 19.7%, while 10.3% of patients seen were found to have elevated BP previously undiagnosed with hypertension in Nigeria.<sup>5</sup>

The role of maxillofacial surgeons in diagnosing and assessing risk factors for important and life-threatening medical conditions such as head and

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neck cancers and hypertension is essential and should be considered to be a part of standard care. Unfortunately, this situation is not always the case. Most practitioners do not make a habit of taking blood pressure reading, even though many possess the necessary equipment and expertise.<sup>6</sup>

The incidence of hypertension among dental patients has been reported to be as high as 32%.<sup>7</sup> The adult dental health survey in 1998 reported that 59% of the population attend for a regular dental check-up and would thus be available for screening.<sup>8</sup> Patients visiting maxillofacial care facilities may present with different comorbidities, which sometimes may be unknown to them or they may be on a complex range of medications for their medical conditions. The goal of treatment is to deliver safe and effective treatment without causing any medical emergency.

There seem to be paucity of documented information on the prevalence of undiagnosed hypertension in relation to specific oral and maxillofacial conditions. The objective of this study therefore was to determine the relevance of routine BP measurement and determine the correlation of hypertension with specific maxillofacial disease conditions as possible risk factors in adult patients attending oral and maxillofacial clinic.

## SUBJECTS AND METHODS

This was a prospective study conducted in patients who visited oral and maxillofacial clinic of university of Uyo teaching hospital from August 2015- August July 2017. Inclusion criteria were all consecutive patients who did not have previous knowledge of their hypertensive status. Patients already on hypertensive management or already diagnosed were excluded.

The variables collected were age, gender, systolic and diastolic blood pressure which were recorded during two visits and the average value taken. The blood pressure (BP) was measured using a digital sphygmomanometer. Detail histories of the patients were documented. Different oral and maxillofacial related problems revealed in the history were broadly categorised and documented under odontogenic tumors, cysts, facial space infections, odontalgia, trigeminal neuralgic pains and trauma.

Classification of blood pressure of respondents was done based on the Chobanian et al, 2003

recommendations.<sup>9</sup> Hypertension was diagnosed when either the Systolic BP or diastolic BP of patients was in the stage 1 or 2 hypertension level of the classification. Thus, normal BP is < 120/80, for prehypertension: BP is 120/80 to 139/89. Stage 1 hypertension: BP is 140/90 to 159/99 mm Hg. Stage 2 hypertension: BP is >160/100

Data analysis was done using the Statistical Package for Social Sciences, SPSS® for Windows, version 21.0 (SPSS Inc, Chicago, IL) statistical software package. Paired-sample t test was used to analyse the variation in parameters within the groups while independent-sample t test was used to compare the means of the two groups. To compare the frequency between the groups, a chi-square test was used. The critical level of significance was set at  $p < 0.05$ .

## RESULTS

The total number of patients with hypertension assessed in this study was 116. Their age ranged between 18 and 77 years with a mean age of  $40 \pm 11.0$  years. Females represented 38.79% ( $n = 45$ ) and males 61.21% ( $n = 71$ ) of the total study group. Prehypertension was present in 23.28% ( $n=27$ ) of the patients (Table 4) while Stage 1 hypertension was present in 45.14% ( $n=57$ ), and Stage 2 in 27.59% ( $n=32$ ) of the patients. Mean systolic BP in the study population was  $145.5 \pm 10.3$  mm Hg, while the mean diastolic BP was  $100 \pm 10.5$  mm Hg. The prevalence of hypertension among the patients by age shows the highest frequency to be 42 (36.20%) in the age range 48-57 years with the least recorded to be age range 18-27 years as shown in table 3. Table 3 also shows that the prevalence of hypertension increased significantly with increasing age group ( $p = 0.001$ ). Table 4 shows the distribution of BP for the different stages of hypertension. Both male and female have highest prevalence of stage 1 hypertension and for both systolic and diastolic BP for each gender group and age group. Odontalgia was recorded as the condition with the highest frequency of hypertension with 29.31% (34) closely followed by trigeminal neuralgic pains with 24.14% (28) as shown in table 5. As shown in table 6, there is almost even distribution of the disease conditions in those without hypertension.

TABLE 1: DISTRIBUTION OF HYPERTENSION

Systolic Blood Pressure	Frequency	Percentage
Pre-hypertension	11	9.48%
Stage 1 hypertension	33	24.45%
Stage 2 hypertension	17	14.66%
<b>Diastolic Blood Pressure</b>		
Pre-hypertension	16	13.79%
Stage 1 hypertension	24	20.69%
Stage 2 hypertension	15	12.93%
<b>Total</b>	<b>116</b>	<b>100%</b>

TABLE 2: PREVALENCE OF HIGH BLOOD PRESSURE BY AGE GROUP

Age (years)	Frequency (n)	%
18-27	3	2.59
28-37	8	6.90
38-47	19	16.38
48-57	42	36.20
58-67	38	32.76
68-77	6	5.17
Total	116	100

p = 0.001

TABLE 3: GENDER PREVALENCE OF HYPERTENSION

Gender	Frequency (n)	Percentage (%)
Male	45	38.79
Female	71	61.21
<b>Total</b>	<b>116</b>	<b>100</b>

TABLE 4: GENDER DISTRIBUTION OF HYPERTENSION STAGES

Gender	Prehypertension	Stage 1 hypertension	Stage 11 hypertension
Male	11	25	9
Female	16	32	23
<b>Total</b>	<b>27</b>	<b>57</b>	<b>32</b>

**TABLE 5: PREVALENCE OF HIGH BLOOD PRESSURE BY DISEASE DISTRIBUTION**

Disease	Frequency	Percentage(%)
Oro-facial Infections	16	13.79
Odontogenic Tumors	19	16.38
Oro-facial Cysts	5	4.31
Odontalgia	34	29.31
Trigeminal neuralgia	28	24.14
Trauma	14	12.07
<b>Total</b>	<b>116</b>	<b>100</b>

**TABLE 6: PREVALENCE OF DISEASE DISTRIBUTION WITHOUT HYPERTENSION**

Disease	Frequency	Percentage (%)
Oro-facial Infections	20	17.24
Odontogenic Tumors	22	18.97
Oro-facial Cysts	21	18.10
Odontalgia	18	15.52
Trigeminal neuralgia	16	13.79
Trauma	19	16.38
<b>Total</b>	<b>116</b>	<b>100</b>

**TABLE 7: STAGES OF BLOOD PRESSURE BY AGE GROUP**

Age group (years)	Prehypertension n (%)	Stage 1 n(%)	Stage 2 n(%)
18-27	1 (33.33)	1 (33.33)	1 (33.34)
28-37	1 (14.29)	6 (71.42)	1 (14.29)
38-47	10 (52.63)	6 (31.59)	3 (15.78)
48-57	7 (16.67)	24 (57.14)	11 (26.19)
58-67	7 (18.42)	19 (50)	12 (31.58)
68-77	1 (16.67)	1(16.67)	4 (66.66)

p = 0.001

**DISCUSSION**

The prevalence of hypertension was lowest in age group 18- 27 years and got to a maximum at 48-57 years. The rise in prevalence of hypertension with increasing age in both male and female in our study

is also supported by a previous study.<sup>10</sup> This is consistent with the global trend in the prevalence of hypertension. cases associated with age. Hypertension is an age related condition. Although from the study, the prevalence of hypertension

decreased with further increase in the age group of 68-77 years.

The prevalence of hypertension in this study tends to increase with the age of respondents, which is in agreement with previous studies.<sup>11</sup> Females had overall higher blood pressure levels than males in this study. When compared within different age groups in the patients with hypertension, this difference was significant. There was also higher prevalence of hypertension in female. This association between hypertension and sex was statistically significant ( $P < 0.001$ ). This is in contrast with the study by Srivastava AK et al. who found more cases of hypertension in males than females.<sup>12</sup>

Patients with odontalgia had the highest cases of hypertension followed by those with trigeminal neuralgia. Both cases are often associated with severe and chronic pain. Trigeminal neuralgia has been reported to occur more frequently in patients with hypertension.<sup>13</sup> It has been suggested that hypertension could be a predisposing factor for arterial tortuosity. It may increase the arterial tortuosity at the brainstem and also increase the chance of developing neurovascular compression, which in turn, contributes to a higher risk for trigeminal neuralgia.<sup>14</sup> Hypertension and trigeminal neuralgia may appear together, at the same time periods.<sup>13</sup> Patients with trauma are among the lowest prevalence. This may be due to the fact that trauma patients present after bleeding or with bleeding thereby reducing the blood pressure.

It was observed that there was relatively even distribution of the disease conditions in the patients without hypertension. This is an indication that certain oral and maxillofacial disease conditions and hypertension may occur in 'cause – and – effect' relationship, although the one that predated the other was not determined from this study.

Stage 1 hypertension was the most prevalent stage of hypertension. This may be because of most of the patients seen have not started experiencing obvious complications of hypertension which is normally observed in stage III hypertension.

Increase in blood pressure can cause harmful effects on the heart and increase the risk of unfavorable events during dental treatment, representative of an alarming sign of permanent hypertensive stage<sup>15</sup>. Measuring blood pressure in maxillofacial clinics

settings is highly recommended and should be part of a routine examination to reduce the number of cases that go undiagnosed which may reverse the treatment protocol depending on patient's medication and disease status.<sup>16</sup> Hence, this will then help to decrease the number of incidents of serious life-threatening diseases and complications such cardiovascular diseases and strokes during or after treatment.

The percentage of those who wrongly presumed that their blood pressure was normal in this study was 50% of the study population. This discrepancy in patients' opinion of their blood pressure and objective finding is of important clinical significance. It is necessary that patients should have their blood pressures checked at initial registration, before and after a major procedure is carried out.

## CONCLUSION

The high prevalence of hypertension observed in this study without prior knowledge of the patients is worrisome considering the potential consequence during procedures. Also, some of the disease conditions particularly odontalgia and trigeminal neuralgic pains may have direct association with hypertension, although the one that preceded the other could not be determined from this study.

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