Blood Pressure Correlates in Orthopaedic and Plastic Patients at a Regional Orthopaedic Hospital in Nigeria

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ABSTRACT

BACKGROUND: Raised blood pressure is a significant surgical risk factor. Post operative complications are worse in both orthopaedic and plastic patients when there is associated hypertension. There has not been any known study on blood pressure variables in patients presenting at the National Orthopaedic Hospital Enugu, Nigeria. This informed the need for the authors to evaluate the blood pressure correlates in patients presenting at this hospital.

METHODS: Patients attending the outpatient clinics of the hospital, between June 2003 and September 2004, were recruited into the study. Their biodata, demographic and clinical characteristics were recorded under standard conditions. Their blood pressure awareness indices, lifestyle habits and co-morbid conditions were evaluated. Structured questionnaires were used with self administered screening done.

RESULTS: Two hundred and eighteen patients with mean age 41.4 (±17.2) years, were screened. Fifty three percent of them were hypertensive, with 87% of these presenting as orthopaedic cases. While 68% irregularly or never checked their blood pressure, those who took alcohol had 54.5% among them, with hypertension.

CONCLUSIONS: This study has shown a high prevalence of hypertension among patients presenting at the study centre. There is also a high degree of association between the lifestyle habits and level of blood pressure. The implications of this for surgical outcome are highlighted.

KEY WORDS: Blood pressure, orthopaedic hospital, Nigeria.

INTRODUCTION

Hypertension has been documented as a significant surgical risk factor[1]. Post-operative complications are worse in both orthopaedic and plastic surgery patients when there is associated hyeprtension[2].

The prevalence of hypertension is on the increase. In Nigeria, the prevalence is around 20 25%[3], while over 30 million people are hypertensive in Sub-Saharan Africa, where hypertension is the commonest cardiovascular cause of morbidity and mortality[4]. More than 800 million people are hypertensive worldwide, with an estimated 1.5 billion people expected to be affected by the year 2025[5].

This scenario is especially worsened by the fact that most people do not routinely check their blood pressure. It has been demonstrated that lifestyle measures affect the blood pressure[6], and reduce/increase the incidence of hypertension[7]. They equally have effect on cardiovascular risk factors and outcome[8].

It was with these in mind that the authors determined to evaluate the blood pressure correlates among orthopaedic and plastic patients presenting at the National Orthopaedic Hospital (NOH), Enugu.

MATERIALS AND METHODS

Design: This was a longitudinal hospital-based study.

Study Area: This study was carried out at the National Orthopaedic Hospital, Enugu, in South East Nigeria. The NOH was established in 1974 and has 180-bed capacity. The hospital is one of three regional specialist hospitals in the country, designated towards orthopaedic and plastic/burns cases. The hospital draws patients from 11 states of the entire South East, South South and Kogi, Benue, Nasarawa and Taraba states of the North central region of the country, thus having a catchment population of about 70 million out of the 150 million national population.

Subjects: Recruitment of patients for the study was done from June 2003 to September 2004. All subjects attending the out patient clinics of the NOH, both new and old, who were willing to participate in the study after an explanation of the purpose of the study, were consecutively recruited on each day of the study. Patients who had already been enlisted for the study, on subsequent attendance to the clinics, were not recruited again, maintaining their initial data, to avoid double or multiple-entry.

Informed consent was obtained from each patient before recruitment. Consent was also obtained from the doctors/consultants who took care of the patients, before administering the questionnaires.

Survey: The data were collected using structured interviewer-administered questionnaires, with both forced response and open-ended questions. The survey was administered by four medical doctors and four medical students specially trained for the survey. They

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conducted the interviews and carried out the measurements. Each session of survey with a participant lasted about 10 15 minutes.

The questionnaire: This contained questions on biodata, family history, co-morbid conditions, in open-ended protocol format. History of hypertension, its duration, antihypertensive treatment and frequency of checking the blood pressure, as well as the adoption of the lifestyle factors had forced-response questions. The lifestyle habits asked for, included alcohol usage, tobacco usage, extra table salt intake, and exercise.

Measurements: Anthropometric measurements of height (in centimetres) and weight (in kilogrammes) were done. The World Health Organization (WHO) criteria for measuring blood pressure, and diagnosing hypertension[9,10], were used. The pulse rate was recorded, using the radial artery.

Statistical analysis: Data was analyzed using SPSS for Windows version 11.0 package[11]. Data were expressed as mean (standard deviation), frequencies and percentages. Pearson correlation was used. Statistically significant level was set at $p = 0.05$.

Ethical Approval: The study protocol conformed to the ethical guidelines of the 1975 Declaration of Helsinki as reflected in a priori approval by the authority of the hospital.

RESULTS

A total of 218 patients were recruited for the study, 120 males and 98 females, giving a male: female ratio of 1.2:1. They comprised of 184 orthopaedic, and 34 plastic patients, respectively. Their ages ranged from 8 to 90 years, with mean age of 41.4 (±17.2) years.

The mean pulse rate was 76(±12) and mean diastolic blood pressure was 93mmHg (orthopaedic) and 88mmHg (plastic). The mean systolic blood pressure was 138mmHg (orthopaedic) and 129mmHg (plastic). The duration of hypertension among the hypertensives ranged between 7 months and 25 years.

Table 1 is a frequency table by age and gender. The 21 30 year age group recorded the highest number of patients (50; 24.8%), while a male presented at 90 years of age.

Students recorded the highest occupational representation (52; 23.9%), most of whom (50; 96.2%) were 30 years or less. These were followed by businessmen (40; 18.4%) **(Table II)**.

Figure 1 shows that as many as 84 (38.5%) of the subjects had up to tertiary education. Sixteen of the respondents had no formal education.

Only 37(17%) respondents checked their blood pressure monthly or more frequently. About 68% (148) of the patients never or irregularly checked their blood pressure **(Table III)**.

There were 115 hypertensives documented in the study one hundred of these were orthopaedic patients (63 males, 37 females) and 15 of them plastic **(Figure 2)**. **Table IV** reveals that 60 of the patients had a family history of hypertension, among whom 57 were hypertensive. Fifty five (54.5%) of the 101 patients who took alcohol were hypertensive while 11 (55%) of the 20 patients who used tobacco, were hypertensive.

Table I: Age and Gender Distribution of Patients

AGE (YEARS)	GENDER		TOTAL
	MALE	FEMALE	
8 - 20	14	11	25
21 - 30	33	21	54
31 - 40	12	12	24
41 - 50	18	20	38
51 - 60	22	24	46
61 - 70	17	6	23
71 - 80	3	4	7
81 - 90	1	-	1
Total	**120**	**98**	**218**

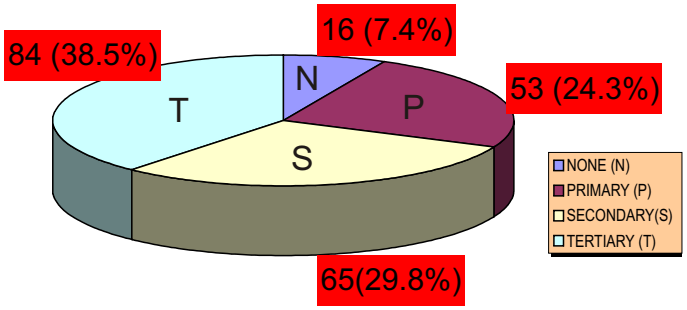

Fig. 1: Educational Levels of the Patients

Table II: Age and Occupational Distribution

Age Range	Students	Business	Civil Servants	Retirees	Artisans	Teachers	Farmers	Professionals	House-wives	Job Applicants /Not specified	Total
8 - 20	20	-	-	-	2	-	-	-	-	3	25
21 - 30	30	9	3	-	4	1	-	2	-	5	54
31 - 40	1	8	2	-	4	1	3	3	-	2	24
41 - 50	1	10	12	-	2	5	-	3	1	4	38
51 - 60	-	8	8	6	7	8	4	1	1	3	46
61 - 70	-	3	-	13	1	2	3	-	-	1	23
71 - 80	-	2	-	3	1	-	1	-	-	-	7
81 - 90	-	-	-	1	-	-	-	-	-	-	1
Total	**52**	**40**	**25**	**23**	**21**	**17**	**11**	**9**	**2**	**18**	**218**

Table III: Frequency of Blood Pressure Check

Frequency	Number	(%)
Never	46	(21.1)
Irregularly	102	(46.8)
6 monthly	12	(5.5)
3 monthly	21	(9.6)
Monthly	10	(4.6)
Weekly	16	(7.3)
Daily	11	(5.1)
Total	**218**	**(100.0)**

Fig. 2: Age and Specialty Distribution of Hypertensives

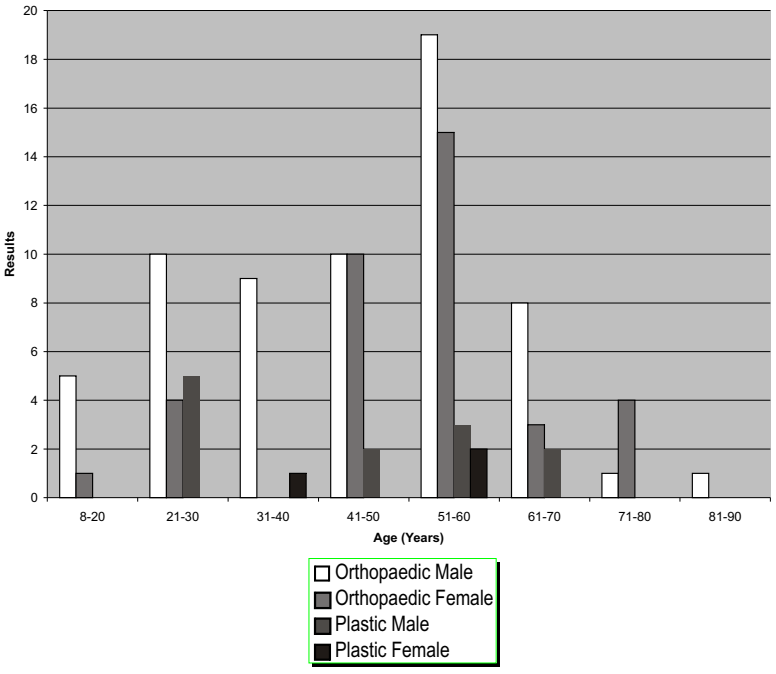

Table IV: Lifestyle Habits by Gender, Occupational, Specialty and BP Distribution

Lifestyle Parameter/Co-morbidity	Students M F	Business M F	Civil Servant M F	Retiree M F	Artisan M F	Teaching M F	Farmers M F	Professional M F	Housewife	Job Applicants/NS	Specialty		Total	Number Hypertensive
											Orthopaedic	Plastic		
Has family hx of Htn	8 6	4 3	4 6	8 4	3 -	2 4	- 1	4 2	1	3	46	11	**60**	57
Known hypertensive	- -	5 2	6 1	6 2	- -	2 2	- 2	1 2	1	-	28	4	**32**	-
Tobacco	3 -	2 1	1 -	2 -	8 -	1 -	1 -	- 1	-	-	14	6	**20**	11
Alcohol	18 6	18 7	6 9	8 1	11 -	2 3	1 7	1 3	-	5	82	14	**101**	55
Extra table salt	6 14	7 5	4 2	4 1	4 -	- 4	- 2	2 2	2	`	52	6	**59**	32
Exercise	18 8	6 4	4 3	4 -	8 -	1 3	- 3	3 3	1	4	57	8	**69**	42
Diabetes	-	1 -	2 -	2 -	- -	- -	- -	- -		-	4	1	**5**	2
Stroke	1 -	1 -	- -	1 1	- -	- -	- -	- -	-	-	4	-	**4**	2

DISCUSSION

This study has shown a high prevalence of hypertension, at 53% (54% for orthopaedic and 44% for plastic patients). This is higher than what obtains in the general population[3,12], and in other hospital-based studies in the region[13,14]. It however, compares in the same range with the prevalence of 55.4% in a population study among black Afro-Caribbeans[15].

The study equally shows a high prevalence of prehypertenison/high normal blood pressure, of 31%. This compares with those of studies done in Israel[16] and United States of America[17]. The cumulative implication of these prevalence rates is that up to 84% of all the patients in this study are at significant surgical and post-operative risks associated with high normal and hypertensive blood pressure values.

More than 20% of the hypertensives was recorded among those less than 30 years of age a group not usually associated with hypertension. This may suggest that their underlying clinical conditions: burns, significant trauma (especially of the spinal column), chronic pain of osteoarthritis, stress ulcers with release of endorphins and the adrenergic hormones may have significant bearing with this high prevalence of hypertension and prehypertension[18]. The attendant effect on surgery, with post-operative complications, such as MODYS, intractable bleeding, shock, acute renal failure, especially with aesthetic/cosmetic surgery, is well documented[19,20].

The study also shows that a significant proportion of those hypertensive (34%) are found in the 51 60 years age group, with the trend of increasing prevalence with age. From this study, 50% of those with hypertension have family history of hypertension, with 25% of known hypertensives not aware if there is any family history of hypertension. These are all in keeping with previous studies, with documented physiological basis[12,13,21,22].

The fact that all the 32 known hypertensives, as revealed by the study, were on treatment, is a positive trend that contrasts with other studies on hypertensives in this, and other, regions of the world. For instance, 33% of these on treatment, in the Nigerian non-communicable disease study[12]; and of the 33% aware of their status in the hypertensions hospital-based study, only 25% are on treatment[14]. Of the 37.5% aware of their hypertensive status in Egypt, only 24% are on treatment[23], while only 28.2% of the 44.7% hypertensives aware of their status in China, are on treatment[21].

The study has also shown the need to actively address the lifestyle habits of these index patients, and particular target groups in the society. Alcohol was the lifestyle habit with significant highest association with hypertension 55% of the 101 patients on alcohol; with the highest consumption rate among the students. Fifty four percent of the patients who took extra table salt were hypertensive and only 32% of the patients exercised regularly. The implication of the effect of

these lifestyle habits on the level of blood pressure and the severity of hypertension, as well as the attendant cardiovascular risk burden, need to be vigorously highlighted to ensure a positive behavioural change.

CONCLUSION

The prevalence of hypertension among patients presenting at this study centre is high.

There is also a high degree of association between the lifestyle habits and level of blood pressure among patients in this study.

The implications of these for surgical outcome, and measures to address these lifestyle variables, are highlighted.

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