

## **Epidemiology of Hypertension in Abuja Metropolis. Federal Capital Territory, Nigeria**

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### **Acronyms**

NCD – Non Communicable Disease  
CAD – Coronary Artery Disease  
WHO – World Health Organization  
SBP – Systolic blood pressure  
DBP – Diastolic Blood Pressure  
MAP – Mean Arterial Pressure  
BP – Blood Pressure  
CO – Cardiac Output  
SVR – Systemic Vascular Resistance  
MI – Myocardial Infarction  
TIA – Transient Ischaemic Attack  
BMI – Body mass index

### **Background**

Hypertension is a major public health problem. It is one of the commonest noncommunicable diseases (NCD) and it affects all races, though the prevalence of occurrence varies.

It is a chronic medical condition defined as a sustained elevation of blood pressure to 140/90 mmHg or more. It can be primary or secondary. Most known cases of hypertension are primary; about 90 – 95% while about 5 – 10% is secondary. In primary, there is no underlying cause while in secondary; there is an underlying medical condition.

Hypertension increases the risk of cardiovascular diseases such as coronary artery disease (CAD), heart failure and stroke. It also increases the risk of renal disease such as chronic kidney disease.

According to a study done by Kearney PM et al, on Global burden of hypertension, about 1 billion people is estimated to have hypertension in the world and an increase of up to 1.56 billion is estimated to occur by 2025.

According to World Health Organization (WHO), report ( 2001) , NCD's accounted for 22% of total deaths in Africa in the year 2000 with cardiovascular diseases accounting for 9.2% of the total deaths.

In Accra, Ghana, a study by Wiredu et al showed that between 1994 and 1998, 11% of deaths in adults over 20 years of age were due to stroke and hypertension was the major cause of these strokes.

In Nigeria, according to a national survey conducted over a decade ago, the prevalence of hypertension was between 10 and 14%. According to a research by the University of Edinburgh in Britain, one in four Nigerians is at risk of being diagnosed with hypertension. The burden of hypertension is seriously underestimated due to lack of data therefore, it is not yet considered as a problem in Nigeria.

If the disease tide is not arrested, the disease may lead to a serious economic and health challenge in Nigeria.

Objective of the study:

- 1) To determine the prevalence of hypertension in Abuja metropolis, Nigeria.

- 2) Epidemiological data on hypertension in Nigeria is necessary to guide policy and develop effective intervention.

## **Introduction**

### **Physiology of blood pressure**

Normal systolic blood pressure (SBP) is between 100 and 140mmHg while normal diastolic blood pressure (DBP) is between 60 to 100mmHg. Pulse pressure (PP) is the difference between the systolic and diastolic pressure and it falls in the range of 40 and 50mmHg.

Mean arterial pressure (MAP) is the average arterial pressure during a single cardiac cycle. It is the perfusion pressure seen by organs in the body. The normal value is between 70 and 110mmHg

A MAP that is lower than the normal value for a prolonged period of time leads to decreased oxygen supply to vital organs. It is represented as  $MAP = SBP + 2 (DBP) / 3$ .

Blood pressure (BP) is the force which causes blood to flow through arteries to the capillaries then back to the heart via the veins. It is measured indirectly by the use of a sphygmomanometer. It is a result of interaction between cardiac output (CO), systemic vascular resistance (SVR) and blood viscosity.

Represented as  $BP = CO \times SVR$ .

### **Pathophysiology**

Hypertension can be primary (essential) or secondary. In essential hypertension, there is usually no specific underlying medical cause and it is seen in about 90 – 95% of patients presenting with hypertension

In secondary hypertension, there is an underlying medical condition giving rise to the elevated blood pressure such as tumors of the kidneys and adrenal glands.

Hypertension has been linked to genetic factors as research has shown similarities in blood pressure within families indicating a form of inheritance

Early in hypertension, no pathological change is seen but when it persists over a long period of time, it leads to damage of target organs like the heart, blood vessels, brain and kidneys thereby increasing the risk of CAD, myocardial infarction (MI), heart failure, renal failure, stroke and even death.

In primary hypertension, there is inappropriate increase in peripheral vascular resistance relative to the cardiac output. There is also thickening of arterial wall and narrowing of arterial lumen. Whether this is a consequence of hypertension or a cause remains unclear.

The renin- angiotensin- aldosterone system also plays an unclear role in development of essential hypertension but drugs which inhibit the system have been shown to be effective in its management.

The autonomic nervous system has also been shown to play an important role in maintaining a normal blood pressure. Increased stimulation of the sympathetic nervous system is known to increase blood pressure.

### **Risk factors for hypertension**

There are many risk factors for hypertension, they include

- 1) Age – the risk of hypertension increases with age. It is usually more common in men from 45 years and above and in women from 65 years and above.
- 2) Race – hypertension and its complications is seen more commonly in blacks.
- 3) Family history – it has been shown to have genetic predisposition. Therefore, a positive family history is a risk factor.
- 4) Overweight and obesity – the rate of hypertension appears to be higher in obese people and overweight than in those with normal weight. A study carried out by Hayashi et al among Japanese Americans demonstrated that there is a link between hypertension and intra – abdominal fat.

- 5) Physical inactivity – apart from inactivity being a risk factor for overweight, it is also associated with increased heart rate. This increased heart rate leads to increased workload on the heart and in turn to increased force of blood flow to the arteries.
- 6) Tobacco use – chemicals in tobacco have been known to damage arterial wall lining leading to atherosclerosis (narrowing of arterial lumen leading to increased blood pressure).
- 7) Excess dietary sodium – this can lead to fluid retention in the body giving rise to increased blood pressure.
- 8) Lack of dietary potassium – potassium deficiency usually leads to sodium retention in the blood which will in turn lead to increased blood pressure by fluid retention.
- 9) Stress – may give rise to temporary increase in blood pressure.
- 10) Alcohol intake – this has been associated with increased blood pressure.

### **Complications of hypertension**

When high blood pressure is not controlled effectively, it can lead to the following complications;

- 1) Artherosclerosis – this is the thickening of the arterial wall and narrowing of the arterial lumen. It occurs as a result of damage of the cells of the vascular wall by high blood pressure. This can lead to decreased blood flow to target organs causing the following:
  - a) Heart – heart attack, heart failure, and angina.
  - b) Kidney – kidney failure
  - c) Brain – stroke, transient ischaemic attack (TIA), dementia.
  - d) Eyes – retinopathy
  - e) Reproductive organ – erectile dysfunction due to decreased blood flow to the penis.
- 2) Aneurysm – this is the bulging out of a section of the arterial wall due to movement of blood through a weakened blood vessel. Rupture of this aneurysm leads to internal bleeding which can be life threatening.

### **Management of hypertension**

Management involves making lifestyle and use of medications. The lifestyle changes for the management of hypertension includes

- Dietary modification – reduction in consumption of high sodium foods, limiting daily salt intake to 2300mg, increase intake of whole grains, fruits and vegetables.
- Exercise – 30 minutes of moderate exercise about three times per week to boost heart health. It also helps to reduce body weight.
- Cessation of smoking and reduction of alcohol consumption.

Drug therapy – Effective antihypertensive therapy can greatly reduce the risk of cardiovascular disease in hypertensive patients. This rapid reduction in cardiovascular risk by BP reduction has been demonstrated by randomized trials .

### **Methodology**

This is a retrospective study which reviewed the case folders of patients who presented at three different primary health institutions at Abuja metropolis, Nigeria within the period January 2012 to December 2012.

Case notes of those diagnosed of hypertension within the study period was selected and reviewed for the purpose of the study.

Hypertension was defined as blood pressure greater than 140/90 mmHg.

The health institutions were primary health centers at different parts of Abuja, Nigeria. The location of these health centers is sub-urban.

Information extracted from the records included, demographics, lifestyle (exercise, smoking and alcohol consumption), indicators for cardiovascular diseases and drug treatment.

## Results

A sum total of 1107 patients presented at the health facilities within the study period. Out of this 150 (13.5%) were being managed for hypertension. 92 (61.3%) of the hypertensive patients were females while 58 (38.7) were males. This gives a male to female ratio of 1: 1.6. 52 (34.7) of these patients were over 60 years of age. The age range of the patients was from 32 years to 89 years. 96 (64%) of the patients were employed while 54 (36%) were unemployed. The most common co –morbid ailment found among the hypertensive patients was diabetes mellitus. It accounted for 51 (34%), obesity 38 (25.3%), congestive cardiac failure 12 (8%), hyperlipidaemia 7 (4.7%), renal diseases 5 (3.3%), others 37 (24.7%). All were on appropriate therapy for their co –morbid conditions.

Blood pressure control was achieved in 83 (55.3%) of the patients while it was not attained in 67 (44.7%) of the patients. About 103 (68.7%) of the patients were reported to have been regular on their antihypertensives. Majority of the study population were in the middle age with a strong female preponderance (61.3%).

48 (32%) of the patients were recorded to be smokers, 37 (24.7%) had past history of smoking while 65 (43.3%) was unrecorded. 25 (16.7%) of the patients were recorded to have alcohol drinking habits, 56 (37.3%) had a past history of alcohol intake while 69 (46%) were unrecorded. History of exercise was recorded in 28 (18.7%) of the patients, 75 (50%) did not have any exercise habit while 47 (31.3%) was not recorded.

## Tables

**Table 1-** Age distribution of hypertensive patients managed during the study period

AGE	FREQUENCY	PERCENTAGE (%)
30 -39	9	6
40 – 49	55	36.7
50 – 59	34	22.7
60 -69	24	16
70 – 79	17	11.3
80 – 89	11	7.3
TOTAL	150	100

**Table 2** Distribution of patients according to smoking habits and hypertension prevalence

SMOKING HABITS	FREQUENCY	PERCENTAGE(%)
CURRENT SMOKERS	48	32
PAST SMOKING HISTORY	37	24.7
UNRECORDED	65	43.3
TOTAL	150	100

**Table 3** Distribution of patients according to alcohol drinking habit and prevalence of hypertension

DRINKING HABIT	FREQUENCY	PERCENTAGE (%)
CURRENTLY DRINKING	48	32
PAST HISTORY	37	24.7
UNRECORDED	65	43.3
TOTAL	150	100

**Table 4** Co- morbid conditions recorded among the hypertensive patients

CO-MORBID CONDITIONS	FREQUENCY	PERCENTAGE (%)
DIABETES MELLITUS	51	34
OBESITY	38	25.3
CONGESTIVE CARDIAC FAILURE	12	8
HYPERLIPIDAEMIA	7	4.7

RENAL DISEASE	5	3.3
OTHERS	37	24.7
Total	150	100

## Discussions

This study presents the prevalence estimate of hypertension in Abuja, the Federal capital of Nigeria. From the study, prevalence of hypertension appeared to be higher among the middle aged than in the older population and also in women. This is in keeping with a study done in Eastern Sudan by Hussain et al. 1999 which showed hypertension being more among females in the middle age bracket. The cluster of hypertensive patients among the middle aged and women may be due to increased health seeking behavior among this group of individuals. A study done in Ghana by Cappucio FB et al reported a consistent increase of blood pressure with age in both men and women. Another study in Kogi state Nigeria also showed an increased blood pressure with age and BMI (Body mass index). In this study, relationship between blood pressure and BMI could not be ascertained as BMI was recorded in only few patients.

The study also showed that blood pressure control was achieved in more than half of the patients (55.3%) but there was no record of drug compliance to ascertain the lack of control in the remaining population.

Lack of adequate record keeping was a major barrier in this study. Record of patient's lifestyle was very inadequate. Among smokers and those who indulge in alcohol there was no history of duration of smoking or alcohol intake. No history of the quantity of cigarette smoked or alcohol intake, this is important in determining their association with hypertension.

The burden of hypertension might be underestimated in Nigeria as there is a serious lapse in record keeping.

## Conclusion

Reduction of hypertension prevalence in Nigeria would go a long way in decreasing mortality and morbidity among middle aged and older population thereby improving quality of life. However, in Nigeria, lack of data has hampered implementation of approaches and programmes that would aim at reducing hypertension prevalence.

## Recommendations

There is need for comprehensive evaluation of hypertension in Nigeria. Cost effective strategies should be implemented in controlling hypertension in Nigeria. At health care level, there is need for complete evaluation of patients as most cases of hypertension are silent.

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