

Prevalence of Hypertension among Diabetic Patients in Sokoto Northwestern Nigeria: A Study of Associated Factors

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Abstract

Original Research Article

According to the World Health Organization (WHO), the prevalence of hypertension is highest in the African Region at 46% of adults aged 25 years and above, while the lowest was found in the American region. The purpose of this study was to identify the prevalence of hypertension among diabetic patients in metabolic clinic of Chemical Pathology Department and Endocrinology clinic of Usman Danfodiyo University Teaching Hospital, Sokoto Nigeria. Also, it aimed to study the subjects' characteristics, anthropometric, and clinical variables contributing to this prevalence. This was a cross-sectional study carried out on adult of both sexes attending metabolic clinic of Chemical-Pathology Department and Endocrinology clinic of Usman Danfodiyo University Teaching Hospital, Sokoto Nigeria, from 1st January 2018 to 31st December, 2018. The inclusion criterion for enrolment in the present study was all diabetic patients attending the clinic at time of the study. Data were extracted from the chemical pathology register, other clinical parameters extracted from the patients case folder, entry and validation was done using Microsoft excel version 13. The data were exported into SPSS version 23.0 (Chicago IL) for windows; for statistical analysis. Numerical data were summarized using measures of central tendency with their respective measures of dispersions. Frequency and percentages were used to summarize categorical data. A total of 182 diabetic patients participated in this study, 63.7% (116) were females, 41.8% were aged between 50-64 years old. More than half of sample (81.%) had been suffering from overt diabetes on average for a period of 4 months, 23.6% (43) have overweight and 57.7% (105) were obese. The prevalence rate of hypertension was 45.1%. We present the socio-demographic characteristics of study population according to hypertension status. The prevalence among women (72%) was higher than men (28%). Furthermore, this findings indicated that there is statistically significant association between gender and hypertension among diabetic patients ($p < 0.05$). DM care providers must prescribe appropriate antihypertensive therapy to control hypertension in persons with DM. Focus must be on patients and family education, counseling and behavioral interventions designed to modify lifestyle such as increasing physical activity and adopting recommended dietary changes, as well as compliance with medications

Keywords: Sokoto Northwestern Nigeria, diabetes, hypertension, prevalence.

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INTRODUCTION

Hypertension is a major risk factor for cardiovascular diseases morbidity and mortality [1, 2].

Hypertension in diabetes is generally attributed to hyperinsulinaemia with resultant increases in renal sodium retention and / or sympathetic nervous system activity. Hyperinsulinaemia induces hypertension through increased insulin resistance, renal tubular reabsorption of Na⁺ and water, increased sympathetic nervous system activity, proliferation of vascular smooth muscle cells and alteration of transmembrane cation transport [3].

Hypertension is the most common non-communicable disease in Nigeria [4]. Globally, elevated BP is the leading risk factor for mortality and morbidity, accounting for 7% [CI 95%, 6.2–7.7] of global disability adjusted life years and 9.4% [CI 95%, 8.6–10.1] million deaths in 2010 [5]. The number of individuals with uncontrolled hypertension (defined as SBP \geq 140 mmHg or DBP \geq 90 mm Hg) increased from 605 to 978 million because of population growth and aging [5]. The number of adults with hypertension in 2025 was predicted to increase by about 60% to a total of 1.56 billion globally [6-8]. According to the World Health Organization (WHO), the prevalence of hypertension is highest in the African Region at 46% of

adults aged 25 years and above, while the lowest was found in the American region [9, 10].

Data from several epidemiologic studies have shown that the prevalence of hypertension in patients with diabetes mellitus is approximately 1.5-2 times greater than in an approximately matched non-diabetic cohort [11, 12].

A number of factors increase BP, including obesity, insulin resistance, high alcohol intake, high salt, intake (in salt-sensitive patients), aging and perhaps sedentary lifestyle, stress, low potassium intake, and low calcium intake [13, 14]. Recognition of the hypertensinogenic factors may allow non-pharmacological prevention, treatment, or cure of hypertension. Hypertensinogenic factors such as obesity, insulin resistance, or high alcohol intake also have an important genetic component [2]. The genetic alterations responsible for inherited "essential" hypertension remain largely unknown [15]. Results from family studies suggest several possible intermediary phenotypes (genetic traits) that may be related to inherited high BP, such as high sodium-lithium counter transport, low urinary kallikrein excretion, high fasting plasma insulin concentrations, high-density LDL sub-fractions, fat pattern index, and body mass index (BMI) [16].

In this setting, the study organized to explore the prevalence, pattern of hypertension in diabetes mellitus patients and also provide some possible recommendation to the findings in-order to reduce the rate of prevalence of hypertension among diabetic's patients.

MATERIAL AND METHOD

This was a cross-sectional study carried out on adult of both sexes attending Department of Chemical-Pathology of Usman Danfodiyo University Teaching Hospital, Sokoto Nigeria, from 1st January 2018 to 31st December, 2018. The inclusion criterion for enrolment in the present study was all diabetic patients attending the clinic at time of the study. Data were extracted from the chemical pathology register, other clinical parameters extracted from the patient case folder, entry

and validation was done using Microsoft excel version 13. The data were exported into SPSS version 23.0 (Chicago IL) for windows; for statistical analysis. Numerical data were summarized using measures of central tendency with their respective measures of dispersions. Frequency and percentages were used to summarize categorical data.

RESULT

A total of 182 diabetic participants were studied, 63.7% (116) were females, while 36.3 % (66) males,

The overall mean age of diabetic's patients was (53.2 ±16) and the age range of (21-87 years) respectively. The peak age incidence occurred within the age range of 50-64 years which accounted for 41.8% (76) followed by <50 years 33% (60), and less age category affected was 65 ≥years 25.3% (46). Predominant of the study participants were obese based on the WHO recommendation ≥ 30kg BMI which accounted for 57.7 % (105), while 25-29.9kg/m² overweight accounted for 23.6 % (43), 18.5-24.9kg/m² normal weight accounted for 17.6 % (32), only 1.1 % (2) were under Weight, there is significant association between gender and hypertension ($X^2=4.357$, $P= 0.03$) Table-1. Result shows that out 182 diabetic's patients 45.1% (82) were hypertensive among these preponderance were females which accounted for 72% (59), while males accounted for 28% (23), the result continues to throw more light on the ages of the of the hypertensive patients where 50-64 jeopardized to risk of high prevalence of hypertension 48.8% (40), followed by age category of >65 years account for (39%, $n= 32$), and the less age category were < 50 year of ages account for (12.2%, $n=10$), the result shows that there is significant association between the age and hypertension ($X^2=32.458$, $P=0.01$). The finding also explore the association between the BMI and the hypertension, where patients with obese 67.1% (55), overweight 18.3% (15) trend was higher compared to normal weight 13.4% (11) or underweight 1.2%(1), however the result indicated that there is no significant relationship between the BMI and the hypertension ($X^2=5.568$, $P=0.135$) Table-2.

Table-1: Socio-demographic characteristics of study population

Characteristics	No of patients	Percent
Gender		
Male	66	36.3
Female	116	63.7
Total	182	100
Age		
<50	60	33
50-64	76	41.8
65≥	46	25.3
Total	182	100
BMI		
<18.5kg/m2	2	1.1
18.5-24.9kg/m2	32	17.6
25-29.9kg/m2	43	23.6
≥30kg/m2	105	57.7
Total	182	100
Duration since diagnosed with obesity		
≤2	46	25.3
3-5	91	50
6-10	37	20.3
11+	8	4.4
Total	182	100

Table-2: Association between presence of risk factors and hypertension

Variables	Hypertension		Total	x ² Value	P-value
	No	Yes			
Gender					
Male	43(43%)	23(28%)	66(36.3%)	4.357	0.03
Female	57(57%)	59(72%)	116(63.7)		
Total	100(100%)	82(100%)	182(100%)		
Age					
<50	50(50%)	10(12.2%)	60(33%)	32.458	0.01
50-64	36(36%)	40(48.8%)	76(41.8%)		
65	14(14%)	32(39%)	46(29%)		
Total	100(100%)	82(100%)	182(100%)		
Duration since diagnosed					
≤2	21(21%)	25(30.5%)	46(25.3%)	3.747	0.29
3-5	55(55%)	36(43.9%)	91(50%)		
6-10	21(21%)	16(19.5%)	37(20.3%)		
11+	3(3%)	5(6.1%)	8(4.4%)		
Total	100(100%)	82(100%)	182(100%)		
BMI					
<18.5kg/m2	1(1%)	1(1.2%)	2(2%)	5.568	0.135
18.5-24.9kg/m2	21(21%)	11(13.4)	32(17.6%)		
25-29.9kg/m2	28(28%)	15(18.3%)	43(23.6%)		
≥30kg/m2	50(50%)	55(67.1%)	105(57.7)		
Total	100(100%)	82(100%)	182(100%)		

Table-3: Binary Logistic Regression of Demographical characterizes among hypertensive patients

Categories	P-value	OR	95% C.I.	
			Lower	Upper
SEX	0.413	1.348	0.659	2.757
Age	0.000	3.201	2.017	5.08
BMI	0.320	1.245	0.808	1.919

DISCUSSION

Based on these findings a total of 182 adults diabetic patients aged 21–87 years, the overall

prevalence of hypertension was 45.1%. This is not the same with other finding from southern of Nigerian, where the prevalence was lower in proportion compared

to our findings [17-19]. The mean age of hypertensive patients was found to be 61.3 ± 13.9 years. This was not corresponded to 38.02 ± 13.3 years found in a survey of hypertension and its awareness amongst traders and artisans in Ogbete Market, Enugu State [20]. In our study, prevalence of hypertension increased with age. Prevalence increased from 12.2% in < 50 years age -group to 48.8% in the 50-64 year age -group. This was in harmony with the findings other studies conducted in Nigeria [19-21]. Furthermore, Age factor was significantly associated with hypertension ($P>0.05$). This was consistent with the result of a survey of hypertension among adult residents of Ajegunle community, Lagos State, Nigeria [18]. Multivariate analysis indicated that age was a predictor of hypertension. Compared to hypertensive patients in <30 years age-group, the odds of developing hypertension was 3 times more in those 50-64 years.

This study shows that more females (72%) had hypertension compared to males (28%). This was consistent with the other findings, prevalence of hypertension was higher among females (79.6%) compared to males (74.4%) in a survey of hypertension in an older adult population in South Africa [22]. Meanwhile result is not consistent with several community-based studies: Survey of hypertension among residents of a rural community in South-East Nigeria, where it was (50.2%) male and (44.8%) female [23], a survey of hypertension in a rural community in Eastern Nigeria: Male (49.3%), female (42.3%) [24], in a survey of hypertension amongst herdsmen living in Tibet, China: Male (66.1%), female (48.3%) [25].

In this study, BMI categorization into four groups showed that 1.2%, 13.4%, 18.3%, and 67.1% were underweight, normal, overweight and obese, respectively. Further categorization into two groups showed that 14.6% and 85.4% were underweight/normal and overweight/obese, respectively. Our finding revealed that there is now significant association between BMI and hypertension, this was not consistent with numerous studies that established the association between BMI and hypertension [24, 26, 27]. Obese respondents had the highest prevalence of hypertension. This agreed with the other findings [17, 28]. Multivariate analysis revealed that being overweight or obese was a predictor of hypertension. Compared to those with BMI in the normal category, the odds of developing hypertension were 2 times more among those in the overweight/obese category.

CONCLUSION

In conclusion generate reliable data that will inform decision-making at the appropriate levels of government. Prevalence rate is an important tool for assessing the magnitude and burden of a health event. Determining the prevalence of hypertension will help

estimate its magnitude in the community. DM care providers must prescribe appropriate antihypertensive therapy to control hypertension in persons with DM.

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