IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 19, Issue 6 Ser.18 (June. 2020), PP 47-52
www.iosrjournals.org

Relationship between Knowledge of Hypertension and 10-Year Cardiovascular Risk among Patients with Hypertension at a Primary Care Clinic in Nigeria.

Ilori HT[1], Adebusoye LA[2], Daramola OO[2],Ajetunmobi OA[3]
[1]*(Family Medicine, Jericho Specialist Hospital, Ibadan, Oyo State, Nigeria)*
[2]*(Family Medicine Department, University College Hospital, Ibadan, Oyo State, Nigeria)*
[3]*(Family Medicine Department, Federal Teaching Hospital, Ido-Ekiti, Ekiti State, Nigeria)*

Abstract:
Background*:Good knowledge of the risk factors, course and consequences of high blood pressure by patients with hypertension can influence their lifestyle, drug adherence and the risk of subsequent development of cardiovascular disease. We aimed at determining the relationship between the knowledge of hypertension and 10-year cardiovascular risk among patients with hypertension.*
Materials and Methods*: It was a cross-sectional survey of 345 hypertensive patients attending the general outpatient clinic of the University College Hospital. Knowledge of hypertension and 10-year cardiovascular risk were estimated using hypertension fact questionnaire and Framingham General cardiovascular risk score respectively. Chi-square and t-test statistics were used for bivariate analysis with a p-value set at 0.05.*
Results*: The age range of the respondents was 35-82 years. Coexistence of other cardiovascular risk factors such as physical inactivity, diabetes mellitus and obesity were found in 66.1%, 35.4 % and 71.3% participants respectively. Less than half (44.3%) of the participants had adequate knowledge about hypertension. There was a significant association between hypertension knowledge and 10-year cardiovascular risk (χ^2= 14.70, p=.001). Also, a significant difference was found in the mean of systolic and diastolic blood pressure, hypertension knowledge score, total cardiovascular risk and physical activity between respondents with adequate and inadequate hypertension knowledge.*
Conclusion: *Given the high inadequate hypertension knowledge and its significant association with 10-year cardiovascular risk. Comprehensive health education on hypertension and its complications should be given to patients to promote their cardiovascular health.*
Key Words*: Hypertension,hypertension knowledge, 10-year cardiovascular risk, cardiovascular disease, primary care clinic.*

Date of Submission: 16-06-2020 Date of Acceptance: 02-07-2020

I. Introduction

Hypertension is a global preventable risk factor for premature death and disability.[1,2] It is of worldwide public health importance because of its high prevalence, poor detection, poor control and the severity of its complications, especially in developing countries.[1,2] There is a 90% lifetime risk of developing hypertension in patients who are normotensive at the age of 55 years.[1] The risk of cardiovascular disease (CVD) doubled with each increment of 20 mmHg in systolic or 10 mmHg in diastolic blood pressure.[1] People with untreated or uncontrolled hypertension are often at risk of developing complications directly associated with the disease. The case fatality rate of hypertension with its related complications was 42.9% in a study in Nigeria.[3] Knowledge of hypertension and cardiovascular risk factors are important for an individual to implement behavioural changes and adhere to medication which will eventually reduce the risk of CVD. However, studies have shown inadequate knowledge of hypertension in various aspects (risk factors, symptoms, treatments and complications) in patients with hypertension. [4-6] In a North Carolina Family Medicine research network, it was found that 22% of patients with hypertension had overall lower knowledge of various aspects of hypertension.[5] Among Nigerians, there is inadequate knowledge of hypertension, its complications and awareness of the lifestyle modification.[4,6,7]In a study among patients with hypertension at Semi urban community in South East Nigeria, majority still have a poor knowledge of their disease.[6]It was found that only 23.4% knew the consequences of poor blood pressure control, 68.7% showed low adherence to medication and 64% were expecting a cure from treatment even though the cause of hypertension was unknown.[6]
In this study, we set out to determine the relationship between knowledge of hypertension and 10-year risk of developing cardiovascular disease. Hypertension is a major risk factor for CVD which has impact on

individual`s health, life expectancy, family structure, function and finance.[1,3] Good knowledge of the risk factors, course and consequences of high blood pressure can influence lifestyle, adherence and subsequently blood pressure control.[4] The information obtained will serve as objective basis for preventing the development of CVDs through efforts aimed at increasing hypertension knowledge, healthy lifestyle and health promoting behaviour among patients with hypertension

II. Material And Methods

Study Design: The study was adescriptivecross-sectional survey of 345 patients with hypertension

Study Location: This study was conducted at the General Outpatients' (GOP) clinic of the University College Hospital (UCH), Ibadan, the capital city of Oyo state, Nigeria. UCH is the oldest teaching hospital in Nigeria. It was established in 1957 and is located in Ibadan North, Local Government area of Oyo State. It is a 1000-bedded tertiary hospital with in-patient and out-patient services. It provides tertiary care for multitudes from a large catchment area of the neighbouring states and other towns in Nigeria as well as secondary care and primary care to patients from suburban and rural areas of the state. Most patients seen at UCH are managed at the GOP Clinic which serves as first contact and primary care clinic within a tertiary hospital setting. It is run by consultant Family Physicians and postgraduate Resident doctors in Family Medicine. Patients who require tertiary care are referred to specialty units within UCH.

Study Population

The study included 345 consenting male and female patients with hypertension aged 30years and above who had been receiving treatment for at least three months at the GOP clinic.Patients presenting as medical emergencies, those with clinical history suggestive of cardiovascular diseases such as stroke and heart failure were excluded.

Sample size& selection method:Participants consistedof 345 patients with hypertension. Simple random sampling technique was used by means of a computer-generated table of random numbers to recruit respondents who met the inclusion criteria every morning over a three-month period.

Ethical approval for the study was obtained from the joint University of Ibadan–UCH Ethical Review. Informed consent was obtained from each participant.

Procedure methodology

A semi-structured questionnaire pretested at the General Outpatient clinic of the Jericho Specialist hospital, Nigeria for validation was used to obtain information on their socio-demography (e.g age, sex), lifestyle (e.g smoking status, alcohol consumption, exercise), medical history (medication usage, diabetes status, family history of CVD). Information on hypertension knowledge was obtained using Hypertension Fact Questionnaire (HFQ). HFQ is a 15-item questionnaire designed to measure the knowledge of participants about its risk factors, treatment and complication. The questionnaire was developed by a research team after extensive literature survey. It was found to have good reliability and the Cronbach alpha was 0.7.[8]The questionnaire was pretested among patients with hypertension at Jericho Specialist Hospital, Ibadan, Nigeria to ensure content-related validity and its appropriateness. Items were statements responded to as yes', 'no' or 'do not know'.

Hypertension knowledge was categorized into two; adequate and inadequate hypertension knowledge, based on the participants' hypertension knowledge scores. A participant was categorized as having adequate knowledge if he/she had a score of 13 or more on a scale of 0 to 15 and inadequate hypertension knowledge if he/she had a score of 0-12.

The respondent's weight was measured to the first decimal kilogram (kg) using a weighing scale(HANA[R] Mechanical bathroom scale, model BR9011 made in China). The zero mark was checked after every reading for accuracy. Standing height was measured to the nearest centimetre, using a Seca model stadiometer. The body mass index was calculated using the formula, Body mass index (BMI) = Weight (Kg)/Height ^{2}(m^2). According to WHO global database on body mass index,[10] study respondent's BMI was classified into four groups namely underweight with BMI less than 18.50kg/m2, normal weight with BMI between 18.5kg/m^2 and 24.99kg/m^2, overweight with BMI greater than or equal to 25kg/m^2 and obesity with a BMI greater than or equal to 30kg/m^2.Blood pressure was measured after the participants were seated for a rest period of 30 minutes. Blood pressure was taken in a sitting position and repeated after a minute interval with the validated Dekamet MK3 sphygmomanometer made by Accoson[R] in England. The appropriate cuff sizes were used according to the circumference of the upper arm. Participants had to fast for 8-14hours before blood collection for investigation. A blood sample was obtained from the cubital fossa according to standard operating procedures. Blood glucose was estimated with a glucometer (Accu-Chek Advantage, Roche Diagnostics, Mannheim, Germany). HDL-cholesterol and total cholesterol were measured using spectrophotometric methods. Laboratory kit reagents (Lot number 2121CH) from Randox Laboratories Limited, United Kingdom were used for all biochemical analysis.Framingham General cardiovascular risk score for use in primary care (Appendix1) was used to estimate the 10-year CVD risk of an individual according to age, total cholesterol, high-density lipoprotein (HDL) cholesterol, systolic blood pressure, antihypertensive medication use, current smoking, and diabetes status.[9] A high actual CVD risk is a 10-year score >20%, intermediate 10%-20% and low actual CVD risk is a 10-year score <10%.

Statistical analysis

The questionnaires were cross-checked and coded serially. Statistical Package for Social Sciences version 17 was used for data entry, cleaning and analysis. Descriptive statistics included frequency for categorical variables, mean and standard deviation for continuous variables. Bivariate association between knowledge of hypertension and 10-year cardiovascular risk was performed using Pearson chi-square. To test for differences in cardiovascular risk factors between adequate and inadequate hypertension knowledge score, independent sample t-test was used for continuous variables and chi-square for categorical variable with a p-value set at .05.

III. Result

The characteristics of the study participants are shown in table 1. The mean age of the respondents was 57 years (9.7), range 35–82 years. Among the participants 24.3% were male, 5.5% reported that they had ever smoked cigarette but none was smoking currently. However, 2.9% consumed alcohol currently. Majority (66.1%) of the participants were physically inactive, 10.1% had family history of cardiovascular disease and 35.4% had comorbid diabetes mellitus. All of the participants were on antihypertensive treatment. Majority (71.3%) of the respondents were obese or overweight and 55.7% of the participants had inadequate knowledge about hypertension from their responses to the hypertension fact questionnaire. One hundred and forty-six (42.3%) of the respondentshad high risk of developing CVD in the next 10years from the point of assessmentwhile 106 (30.7%) hadlowcardiovascular (CV) risk.

Table no 1: Respondents Characteristics (N=345**)**

Characteristics	Frequency (%)
Sex	
Male	84 (24.3)
Female	261(75.7)
Smoking status	
Ever smoked	19 (5.5)
Never smoked	326 (94.5)
Current alcohol intake	
Yes	10 (2.9)
No	335 (97.1)
Physically active	
Yes	117 (33.9)
No	228 (66.1)
Family history of CVD	
Yes	35 (10.1)
No	310 (89.9)
Diabetic	
Yes	122 (35.4)
NO	223 (64.6)
Obese or overweight (BMI>25Kg/m^2)	
Yes	246 (71.3)
No	99 (28.7)
Knowledge of hypertension	
Adequate	153 (44.3)
Inadequate	192 (55.7)
Using antihypertensives	
Yes	345 (100)
No	0 (0)
10-year cardiovascular risk	
High	146 (42.3)
Intermediate	93 (27.0)
Low	106 (30.7)

Table 2 shows the analysis of association between CV risk and hypertension knowledge. There was a significant association between CV risk and hypertension knowledge of the participants. A higher proportion of participants with high CV risk (55.7%) had inadequate hypertension knowledge, compared to those with adequate knowledge (44.3%). Similarly, among participants with intermediate CV risk, a higher proportion also had inadequate hypertension knowledge (56.2%). However, respondents with low CV risk had a higher proportion of those with adequate hypertension knowledge (57.5%) compared to those with inadequate (42.5%) hypertension knowledge. This was statistically significant at χ^2= 14.70, p=.001.

Table no 2: Relationship between Knowledge of hypertension and 10-year Cardiovascular risk of respondents (N=345)

Variable	CV risk Low (%)	Intermediate (%)	High (%)	Total (%)	χ^2	p value
Hypertension knowledge						
Adequate	61 (57.5)	28 (30.1)	64 (43.8)	153 (44.3)	14.70	0.001*
Inadequate	45 (42.5)	65 (69.9)	82 (56.2)	192 (55.7)		

*significant at p=0.05

On comparison of cardiovascular risk factors of participants with inadequate and adequate knowledge of hypertension, there was statistically significant difference in: Mean (SD) Hypertension Fact Questionnaire score 13.78 (0.75) v 10.32 (1.97) [p =.001], Systolic Blood Pressure (mmHg) 140.42 (20.81) v 135.82 (19.06) [p=.04], Diastolic Blood Pressure (mmHg) 82.69 (10.43) v 80.41 (10.79) [p=.04], 10-year Total Cardiovascular Risk 15.68 (5.71) v 14.12 [6.07) [p=.02] and Physical activity 62.1% v 37.9% (χ^2= 10.19, p=.001) as shown in table 3.

Table no 3. Comparison of CV risk factors between participants with inadequate and adequate hypertension knowledge scores (N=345)

Variables	Hypertension knowledge Inadequate (n =192) n (%) or mean (SD)	Adequate (n=153) n (%) or mean (SD)	t /χ^2	p value
Physical activity				
Yes	50 (42.7)	67 (57.3)	10.19	0.001*
No	142 (62.1)	86 (37.9)		
Age	58.02 (10.05)	56.65 (9.30)	1.296	0.20
HFQ score	10.32 (1.97)	13.78 (0.75)	-22.397	0.001*
BMI (Kg/m^2)	27.95 (6.05)	28.83 (5.59)	-1.393	0.20
SBP (mmHg)	140.42 (20.81)	135.82 (19.06)	2.172	0.04*
DBP (mmHg)	82.69 (10.43)	80.41 (10.79)	1.979	0.04*
Total-C (mg/dl)	160.38 (43.86)	160.84 (39.56)	-0.101	0.92
HDL-c (mg/dl)	41.84 (6.73)	42.44 (7.58)	-0.801	0.42
FBG (mg/dl)	106.51 (26.61)	105.15 (20.84)	0.519	0.60
10-year TCVR	15.68 (5.71)	14.12 (6.07)	2.453	0.02*

*significant at p=0.05

Abbreviations: HFQ=hypertension fact questionnaire, BMI= body mass index, SBP= systolic blood pressure, DBP= diastolic blood pressure, Total-c= total cholesterol, HDL= high density lipoprotein, FBG= fasting blood glucose, TCVR= total cardiovascular risk.

IV. Discussion

The aim of this study was to investigate the relationship between the knowledge of hypertension and 10-year cardiovascular risk among patients with hypertension. In this study, 2.9% were currently taking alcohol and none was a current smoker. This is in contrast to findings in rural sites of Africa.[11]This could be because the present study is hospital-based where there is a regular emphasis on lifestyle modification and smoking cessation.

One-third of the respondents in this study had diabetes mellitus, this is because diabetes mellitus is a common co-morbidity of hypertension and vice versa.[12,13] More than two thirds of the respondents were obese or overweight in this study. This is consistent with the finding reported in Southwest Nigeria in which about two-thirds of the hypertensive patients were obese or overweight.[14]This could be explained by the fact that two third of the respondents in this present study were physically inactive.

Patients with hypertension tend to have a clustering of cardiovascular risk factors as found in this study.[14-17] In Indian, it was found that hypertension occurs in isolation in 2.6 % of the participants while co-existence of hypertension and more than three cardiovascular risk factors was observed in 12.3% participants.[15]In a study among patients attending the outpatient clinic of a Nigerian teaching hospital, 41.2% of the participants had a clustering of at least two co-morbidities, while about a quarter had the three conditions coexisting. One-tenth of the participants in this study had family history of CVD which is an independent risk factor for the development of CVD in people with hypertension.[16]These are risk factors for atherosclerosis and macrovascular pathologies hence, multiplying their overall risk of CVD.[17]

There is a relationship between knowledge of hypertension and 10-year cardiovascular risk in this study. Participants with high cardiovascular risk had a higher proportion of those with inadequate knowledge of hypertension. This finding has clinical implications because it provides evidence that educating patients on risk factors for hypertension, treatment and its complication will help to control their blood pressure and subsequently prevent CVD. A significant difference was found in the mean of systolic and diastolic blood pressure, hypertension knowledge score, total cardiovascular risk and physical activity between participants with adequate and inadequate hypertension knowledge.Adequate knowledge of hypertension is important for an individual to implement behavioural changes. Lifestyle measures such as smoking cessation, restricting the intake of salt, regular physical exercise, healthy eating pattern and losing weight is a non-pharmacological intervention in reducing the risk of developing CVD among patients with hypertension.

This study showed a relationship between knowledge of hypertension and risk of CVD. However, other CVD risk factors such as the family history of premature CVD, obesity and physical inactivity are not incorporated in the Framingham General cardiovascular risk score which may underestimate or overestimate risk.

V. Conclusion

This study showed that knowledge of hypertension is still inadequate in Nigeria even among patients with hypertension and inadequate knowledge of hypertension is associated with high cardiovascular risk. Therefore, knowledge enhancement no matter the reason for encounter is essential for optimal cardiovascular health.

References

[1]. Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. The JNC-7 Report [document on the Internet]. Department of Health and Human Services; 2003.

[2]. Mills KT, Bundi JD,Kelly TN et al. Global Disparities of Hypertension Prevalence and Control. A Systematic Analysis of Population-Based Studies from 90 Countries. Circulation. 2016;134:441–50

[3]. Arodiwe EB, Ike SO, Nwokediuko SC. Case fatality among hypertension-related admissions in Enugu, Nigeria. Niger J ClinPrac. 2009;12(2):153-56.

[4]. Almas A, Godil SS, Lalani S, Samani ZA, Khan AH. Good knowledge about hypertension is linked to better control of hypertension; a multicentre cross sectional study in Karachi, Pakistan. BMC Res Notes.2012;24(5):579.

[5]. Viera AJ, Cohen LW, Mitchell CM, Sloane PD. High blood pressure knowledge among primary care patients with known hypertension: A North Carolina Family medicine research network (NC-FM-RN) study. J Am Board Fam Med. 2008;21(4):300-8.

[6]. Okwuonu CG, OjimaduNE,Okeke EI, Akemokwe FM. Patient-related barriers to hypertension control in a Nigerian population. Int. J. General Med.2014;7:345-53.

[7]. Busari OA, Olanrewaju TO, Desalu OO et al.Impact of patients' knowledge, attitude and practices on hypertension on compliance with antihypertensive drugs in a resource-poor setting. TAF Prev Med Bull.2010;9(2):87-92.

[8]. Saleem F, Hassali MA, Shafie AA, AwadAGand Bashir S. Association between knowledge and drug adherence in patients with hypertension in Quetta, Pakistan. Trop J Pharm Res. 2011;10(2):125-32.

[9]. D'Agostino RB, Vasan RS, Pencina MJ et al. General cardiovascular risk profile for use in primary care: the Framingham Heart Study. Circulation. 2008 ;117(6):743-53.

[10]. WHO Global database on body mass index. Body mass index classification. 2004. Available at: http://www.who.int/bmi/index.jsp. Accessed on 9/11/2013.

[11]. Negin J, Cumming R, Stewart de Ramirez S, Abimbola S, Ehrlich Sachs S. Risk factors for non-communicable diseases among older adults in rural Africa. Trop Med Int Health. 2012;16(5):640–46.

[12]. Umoh, VA, Akpa EE, Alphonsus I. Hypertension among Type 2 Diabetic Patients in Uyo, South East Nigeria. J Advances Med Medical Res. 2018; 26(6): 1-6

[13]. Chahoud J, Mrad J, Semaan A, Asmar R. Prevalence of diabetes mellitus among patients with essential arterial hypertension. J Med Lib. 2015;63(2): 74-80.

[14]. Akintunde AA, Akinwusi PO, Adebayo RA, Ogunyemi S, Opadijo OG. Burden of obesity in essential hypertension: pattern and prevalence. Niger J ClinPract. 2010;13(4):399-2.

[15]. Jeemon P, Prabhakaran D, Goenka S, Ramakrishnan L, Padmanabhan S, Huffman M. Impact of comprehensive cardiovascular risk reduction programme on risk factor clustering associated with elevated blood pressure in an Indian industrial population. Indian J Med Res. 2012;135(4):485-93.

[16]. Ogunleye OO, Ogundele SO, Akinyemi JO, Ogbera AO. Clustering of hypertension, diabetes mellitus and dyslipidemia in a Nigerian population: a cross sectional study. Afr J Med MedSci.2012 ;41(2):191-95.

[17]. Martell-Claros N,Galgo-Nafria A. Cardiovascular risk profile of young hypertensive patients: the OPENJOVEN study.Eur J Prev Cardiol.2012;19(3):534-40.

APPENDIX 1: FRAMINGHAM GENERAL CARDIOVASCULAR RISKS SCORE

AGE(YEAR)	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75+
MEN POINT	0	2	5	6	8	10	11	12	14	15
WOMEN POINT	0	2	4	5	7	8	9	10	11	12

TOTAL CHOLESTEROL	MEN	WOMEN
<160	0	0
160-199	1	1
200-239	2	3

240-279	3	4
280+	4	5

DIABETES	MEN	WOMEN
NO	0	0
YES	3	4

HDL	MEN	WOMEN
60+	-2	-2
50-59	-1	-1
45-49	0	0
35-44	1	1
<35	2	2

CURRENT SMOKER	MEN	WOMEN
NO	0	0
YES	4	3

SYSTO-LIC BP	TREATED	UNTREATED	SYSTOLIC BP	TREATED	UNTREATED
MEN			WOMEN		
<120	0	-2	<120	-1	-3
12-129	2	0	120-129	2	0
130-139	3	1	130-139	3	1
140-159	4	2	140-149	5	2
160+	5	3	150-159	6	4
			160+	7	5

MEN: 10- YEAR RISK

TOTAL POINT	< -3	-2	-1	0	1	2	3	4	5	6	7
RISK %	<1	1.1	1.4	1.6	1.9	2.3	2.8	3.3	3.9	4.7	5.6
TOTAL POINT	8	9	10	11	12	13	14	15	16	17	18
RISK%	6.7	7.9	9.4	11.2	13.2	15.6	18.4	21.6	25.3	29.4	>30

WOMEN: 10-YEAR RISK WOMEN: 10-YEAR RISK

TOTAL POINT	< -2	-1	0	1	2	3	4	5	6	7	8	9
RISK %	<1	1.0	1.2	1.5	1.7	2.0	2.4	2.8	3.3	3.9	4.5	5.3
TOTAL POINT	10	11	12	13	14	15	16	17	18	19	20	21+
RISK %	6.3	7.3	8.6	10.0	11.7	13.7	15.9	18.5	21.5	24.8	28.5	>30

Ilori HT, et. al. "Relationship between Knowledge of Hypertension and 10-Year Cardiovascular Risk among Patients with Hypertension at a Primary Care Clinic in Nigeria." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS),* 19(6), 2020, pp. 47-52.