

Original Research Article

Knowledge and control practices of hypertension among diabetic attending LAUTECH teaching hospital Osogbo, Nigeria

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ABSTRACT

Background: Hypertension in diabetes is an added burden and the comorbidity a faster genesis of many cardiovascular diseases that exposes the diabetics to several complications, disabilities and higher mortality rate than the non-diabetics. This study therefore assesses the knowledge and control practice of hypertension among the hypertensive diabetics attending the endocrine clinic of LAUTECH Teaching hospital Osogbo, Osun state.

Methods: A quantitative descriptive survey design was adopted and a total enumeration method was used in recruiting 102 hypertensive diabetics. A structured questionnaire was administered and used to collect data. Descriptive statistics were used to answer the research questions.

Results: The overall knowledge level of hypertension among the hypertensive diabetics was above average with overall mean score of 54.01 (65.9%). The control practice level was fair with overall mean score of 45.1%.

Conclusions: Efforts to increase the knowledge and control practices of hypertension should not focus only on general health education, but individual specific knowledge needs. Practical sections that show case the lifestyle practices that will explain what hypertension self-care maintenance, monitoring and management practices such as exercise sections, diet sections actually means should be incorporated in the clinic routine.

Keywords: Control practice, Endocrine clinic, Hypertensive diabetics, Knowledge

INTRODUCTION

Hypertension in diabetes is an added burden and the comorbidity a faster genesis of many cardiovascular diseases that exposes the diabetics to several complications, disabilities and higher mortality rate than the non-diabetics. Yet, the knowledge and daily application of hypertension control life style practices in the context of diabetes combined with the use of various pharmacological interventions has been confirmed to control and reduce the negative effect of uncontrolled

blood pressure on the general well-being of the diabetics. But, despite this findings, the higher failure in blood pressure control and the increasing number of complications and death rate among the hypertensive diabetics, points to the fact that the knowledge of hypertension and its control practices still needs to be questioned among this high risk group. Blood pressure is the force exerted by blood against the walls of the arteries. Hypertension occurs when this force is too high.¹ Anju et al reinstating the WHO declaration that hypertension affects 1.13 billion people globally, and

there is a 54 percent increase in hypertension prevalence among the diabetics.^{1,2} Tadesse et al also stated that hypertension will increase the mortality rate of the diabetics by 7.2 folds and will kill up to 80 % of them since most diabetics develops hypertension.³ Statistics from Centers for Disease Control and Prevention (CDC) and National Health and Nutritional Examination Survey database show that incidence of Type 2 diabetes mellitus has risen steeply in the last few decades.^{4,5} It is estimated that diabetes affects 30.3 million people in the United States, and 73.6% of individuals aged 18 years or more with diabetes, have hypertension. In Nigeria, Onuoha and Egwin recorded 44% prevalence of hypertension among the diabetics at age 57 and also noted that the value rose to 85.5% by the age of 80 years with lesser percentage of 1% to 24.4%, prevalence rate among the non-diabetic as compared with 18-85.5% prevalence of hypertension among the diabetics.⁶

Hypertension is a strong risk factor for cardiovascular diseases such as heart failure, micro vascular complications and arteriosclerotic cardiovascular diseases which were recorded as the leading cause of disease and death among the diabetics.⁷ Grossman et al further added that the coexistence of hypertension and diabetes also put patients at risk of retinopathy and nephropathy.⁸ The risk of cardiovascular disease is increased by 41% and mortality rate by 44% as compared to 9% and 7% when diabetes exist alone.⁹ If this current trajectory continues, three-fourth of all deaths in Africa will be attributable to hypertension by the year 2020.¹⁰ Barynes defines diabetes has a chronic disorder characterized by a total or partial deficiency of insulin action and insulin resistance which causes metabolic syndrome characterized by hyperglycaemia, glycosuria, polyphagia, polydipsia, polyuria and alterations of lipid and protein metabolisms, a vascular syndrome including macrovascular alterations of all organs, especially the heart, brain and peripheral circulation, kidney and retina.¹¹ A microvascular component involving the microcirculation producing mainly endothelial dysfunction and a peripheral or autonomous neuropathic syndrome that results from vascular dysfunction. Diabetes alone increase the risk for cardiovascular disease by fivefold reducing life expectancy by 15 years with the risk for cardiovascular disease becoming even greater when diabetes co-exist with hypertension.¹² However, the Global Diabetes Community stated that overweight or obesity and unhealthy life styles such as high calorie diet, high carbohydrate or high sugar diets, sedentary life style, long time persistent stress and chronic use of high dose of steroid leads to persistent hyperglycemia or high blood glucose which increases adiposity.¹³ Adiposity is associated with increased insulin resistance.^{14,15} Studies shows that insulin resistance is associated with an increase in vascular adhesion molecule expression, oxidative stress, inflammation, and decreased vascular nitric oxide levels, which in turn promote vascular stiffness resulting in persistent hypertension.¹⁴ According to Anju et al, renal insufficiency in the diabetics might

also impair the ability to excrete water and solute thereby worsening the volume expansion that was initially induced by hyperglycemia and hypernatremia in the diabetics.² Rennin angiotensin aldosterone system is also a main factor of hypertension in diabetes.

Global Diabetes Community stated that lifestyles such as regular exercise, low carbohydrate diets, very low caloric diet, weight loss that helps in glycemic control will go a long way in reducing the body's need for insulin, removes hyperinsulinemia and its hypertension development mechanisms.¹³ In Nigeria, documentations of knowledge and control practices of hypertension among the diabetics is so scarce that the majority of studies on hypertension in diabetics were mainly based on the prevalence, determinants and the control of hypertension in diabetes and not their knowledge. This study was conducted to assess the knowledge and control practice of hypertension among the hypertensive diabetics attending LAUTECH Teaching Hospital Osogbo, Osun State as it outcome may serve as an essential starting point for the control of hypertension among the diabetics.

METHODS

This study adopted a quantitative descriptive survey design in assessing the knowledge and control practices of hypertension among hypertensive diabetics attending LAUTECH Teaching Hospital Osogbo. Total enumeration was adopted to select the 102 respondents for the study.

Instrumentation

Researcher developed questionnaire was used to collect data for this study. The questionnaire was divided into 3 sections: Section A: socio-demographic characteristics of the respondents, Section B: Consist of patient's knowledge of hypertension, Section C comprised of hypertension control practices. The instrument has a reliability Cronbach Alpha coefficient of 0.753.

Method of data analysis

The data was analyzed using Statistical Package for Social Science (SPSS) version 25. The research questions were analyzed using descriptive statistics (frequency counts, percentage distribution and mean).

Ethical consideration

Permission and ethical clearance were taken from the Babcock University Health Research Ethics Committee (BUHREC) to conduct the study while permission to carry out the research was taken from appropriate authorities of LAUTECH Teaching Hospital, Idiseke, Osogbo. And informed consent was taken from the respondents after the objectives and the significance of the study were explained.

RESULTS

Table 1 showed that 74.5% respondents understand what normal blood pressure is, 54.9% of respondents understand being hypertensive when systolic blood pressure is 140 mmHg and above on two separate occasions. Only 35.5% agreed that diastolic blood pressure of 90 mmHg and above on two separate occasions is hypertension. 59.8% respondents agreed that

high blood pressure can present without a sign while 88.2% agreed that high blood pressure can present with headache. 68.6% knows that high blood pressure can present with palpitation while 85.6% knows that it can also present with sleeplessness. 66.7% of the respondents know that diabetes can cause hypertension while 77.5% know that hypertension can be a complication of diabetes.

Table 1: Knowledge of hypertension among hypertensive diabetics.

ITEMS	Yes	No	IDN
Normal blood pressure value is 120/80 mmHg	76 (74.5)	16 (15.7)	10 (9.8)
A person is said to be hypertensive when the systolic blood pressure (top value) is 140 mmHg and above on two separate occasions.	56 (54.9)	21 (20.6)	25 (24.5)
A person is said to be hypertensive when the diastolic blood pressure (lower value) is 90 mmHg and above on two separate occasion.	36 (35.3)	34 (33.3)	32 (31.4)
High blood pressure can present without a sign.	61 (59.8)	30(29.4)	11 (10.8)
High blood pressure can present with headache.	90 (88.2)	8 (7.8)	4 (3.9)
One of the sign of high blood pressure is palpitation.	70 (68.6)	17 (16.7)	15 (14.7)
Sleeplessness is one of the sign of high blood pressure.	87 (85.3)	9 (8.8)	6 (5.9)
Diabetes can cause hypertension.	68 (66.7)	9 (8.8)	25 (24.5)
Hypertension can be a complication of diabetes.	79 (77.5)	6 (5.9)	17 (16.7)
Daily intake of more than 2 bottles of alcohol can cause high blood pressure.	59 (57.8)	24 (23.5)	19 (18.6)
Smoking can prevent blood pressure control.	54 (52.9)	24 (23.5)	24 (23.5)
Lack of 30 min. of daily moderate exercise can prevent blood pressure control.	54 (52.9)	14 (13.7)	34 (33.3)
Sedentary life style can prevent blood pressure control	53 (52.0)	11 (10.8)	38 (37.3)
Overweight can prevent blood pressure control	76 (74.5)	9 (8.8)	17 (16.7)
Consumption of more than 1.500 milligram of salt per day can prevent blood pressure control.	89 (87.3)	9 (8.8)	4 (3.9)
Can stress increases blood pressure?	87 (85.3)	9 (8.8)	6 (5.9)
Blood pressure increases with ageing	82 (80.4)	10 (9.8)	10 (9.8)
Persistently taking fatty diet such as butter can prevent blood pressure control.	62 (60.8)	25 (24.5)	15 (14.7)
High carbohydrate diet can prevent blood pressure control.	46 (45.1)	37 (36.3)	19 (18.6)
Persistent increase in blood sugar level can prevent blood pressure control.	59 (57.8)	19 (18.6)	24 (23.5)
Hypertension can worsen with increasing blood sugar	73 (71.6)	8 (7.8)	21 (20.6)
High blood pressure can cause disorder of the eye.	78 (76.5)	11 (10.9)	13 (12.7)
High blood pressure can cause disorder of the kidney.	76 (74.5)	2 (2.0)	24 (23.5)
High blood pressure can cause the disorder of the heart.	77 (75.5)	6 (5.9)	19 (18.6)
High blood pressure can increases the risk of having incurable wounds.	44 (43.1)	42 (41.2)	16 (15.7)
High blood pressure can cause stroke.	89 (87.3)	11 (10.8)	2 (2.0)
Hypertension increases the rate of diseases	72 (70.6)	15 (14.7)	15 (14.7)
Hypertension increases the rate of death	93 (91.2)	2 (2.0)	7 (6.9)
Consistently maintaining a normal blood sugar level can control blood pressure.	83 (81.4)	5 (4.9)	14 (13.7)
Compliance with antidiabetic drug can help control blood pressure.	83 (81.4)	7 (6.9)	12 (11.8)
Compliance with regimen of anti hypertensive drug help control blood pressure	87 (85.3)	8 (7.8)	7 (6.9)
Antihypertensive drugs should only be used when blood pressure is high	49 (48)	48 (47.1)	5 (4.9)
More than one antihypertensive drug is required to control blood pressure.	64 (62.7)	16 (15.7)	22 (21.6)
Anti hypertensive drugs should be used for life	72 (70.6)	25 (24.5)	5 (4.9)
Herbal mixtures can help control high blood pressure.	41 (40.2)	26 (25.5)	35 (34.3)
The right amount of carbohydrate needed to maintain my blood sugar is the size of my folded palm.	74 (72.5)	18 (17.6)	10 (9.8)
A fasting blood sugar of 4-7mmol/L is normal.	50 (49.0)	44 (43.1)	8 (7.8)
Potassium rich foods such as unripe plantain can help control blood pressure.	72 (70.6)	16 (15.7)	14 (13.7)
Food supplement can help maintain blood pressure within the normal range.	49 (48.0)	30 (29.4)	23 (22.5)
Food rich in fibre such as vegetables can assist in the control of blood pressure	60 (58.8)	30 (29.4)	12 (11.7)
Taking fresh fruits can assist in blood pressure control	46 (45.1)	51 (50.0)	5 (4.9)

Table 2: Summary of knowledge level of hypertension among the hypertensive diabetics.

Categories	Criteria	Frequency	Percentage	Remark
55-82	Above average	50	49.02	Number of the respondents with knowledge of hypertension above average
28-54	Average	30	29.41	Number of the respondents with knowledge of hypertension at average level
1-27	Below average	22	21.57	Number of the respondents with knowledge of hypertension below average

Mean=54.01 (65.9%), SE of Mean = 0.99, Std. dev=18.99

Table 3: Control practices of hypertension among hypertensive diabetics.

Variables	Daily	TWL	TRWL	M	N
I limit the amount of salt in my diet (less 1500mg)	84 (82.4)	10 (9.8)		8 (7.8)	
I substitute one of my meal for fresh fruits	43 (42.2)	27 (26.5)	8 (7.8)	12 (11.8)	12 (11.8)
I eat food rich in fibre such as vegetables	67 (65.7)	26 (25.5)	2 (2.0)	4 (3.9)	3 (2.9)
I limit carbohydrate intake to the size of my folded palm.	74 (72.5)	14 (13.7)	9 (8.8)	2 (2.0)	3 (2.9)
I drink more than two bottles of alcohol	13 (12.7)	9 (8.8)	9 (8.8)		71 (69.6)
I avoid certain food such as heavy starch for the purpose of maintaining my health	56 (54.9)	14 (13.7)	10 (9.8)	14 (13.7)	8 (7.8)
I smoke	8 (7.8)	3 (2.9)	4 (3.9)		89 (85.3)
I perform at least 30min of moderate Exercise.	49 (48.0)	14 (13.7)	15 (14.7)	21 (20.6)	3 (2.9)
I take vitamin C to control my blood pressure.	39 (38.2)	9 (8.8)	5 (4.9)	9 (8.8)	40 (39.2)
I take potassium rich food such as unripe plantain to control my blood pressure.	44 (43.1)	18 (17.6)	24 (23.5)	7 (6.9)	9 (8.8)
I eat fatty foods such as magrin, butter,	11 (10.8)	7 (6.9)	14 (13.7)		70 (68.6)
I use prefer vegetable oil to palm oil in my cooking	25 (24.5)	13 (12.7)	9 (8.8)	5 (4.9)	50 (49.0)
My daily work is stressful.	40 (39.2)	16 (15.7)	8 (7.8)	5 (4.9)	33 (32.4)
I take over the counter drugs when an not fine	5 (4.9)	14 (13.7)	4 (3.9)	79 (77.5)	5 (4.9)
I take my antidiabetic drugs as prescribed by the doctor	94 (92.2)			8 (7.8)	94 (92.2)
I only take my antidiabetic drug when am not fine.	36 (35.3)	16 (15.7)	8 (7.8)	42 (41.2)	36 (35.3)
I take my antihypertensive drugs as prescribed by the doctor.	92 (90.2)		2 (2.0)	8 (7.8)	92 (90.2)
I only take my antihypertensive drug when am not fine	21 (20.6)	21 (20.6)	4 (3.9)	56 (54.9)	21 (20.6)
Once blood Pressure is normal, I stop using anti-hypertensive drugs without contacting the doctor	19 (18.6)	28 (27.5)	18 (17.6)	37 (36.3)	19 (18.6)
I remove some antihypertensive drugs when am fine.	7 (6.9)	12 (11.8)	13 (12.7)	70 (68.6)	7 (6.9)
I use herbal mixture to control my blood pressure.	28 (27.5)	4 (3.9)	55 (53.9)	15 (14.7)	28 (27.5)
I check my blood pressure	30 (29.4)	6 (5.9)	9 (8.8)	48 (47.1)	9 (8.8)
I check my blood sugar	55 (53.9)	17 (16.7)	5 (4.9)	11 (10.8)	14 (13.7)
I record my blood sugar readings.	52 (51)	11 (10.8)	10 (9.8)		29 (28.4)
I record my blood pressure check.	20 (19.6)	12 (11.8)	10 (9.8)	29 (28.4)	31 (30.4)
I adjust meals base on blood sugar reading	50 (49.0)	6 (5.9)	9 (8.8)	28 (27.5)	9 (8.8)
I monitor my weight.	23 (22.5)	9 (8.8)	5 (4.9)	51 (50.0)	14 (13.7)
I record my weight value	18 (17.6)	9 (8.8)	5 (4.9)	51 (50.0)	19 (18.7)
I taste my urine to monitor blood sugar.	32 (31.4)	6 (5.9)	2 (2.0)	12 (11.8)	50 (49.0)
I adjust my meal when I notice high weight gain.	40 (39.2)	10 (9.8)	10 (9.8)	5 (4.9)	37 (36.3)
	Always	Sometimes	Rarely	Never	
I keep clinic appointments.	78 (76.5)	14 (13.7)	7 (6.9)	3 (2.9)	
I come to clinic when my blood pressure is high	19 (18.6)	5 (4.9)	12 (11.8)	66 (64.7)	
I report high blood glucose to the doctor.	65 (63.7)	10 (9.8)	9 (8.8)	18 (17.6)	
I consult the pharmacist when my blood glucose is high.	13 (12.7)	9 (8.8)	5 (4.9)	75 (73.5)	
I report high blood pressure to the doctor.	64 (62.7)	17 (16.7)	8 (7.8)	13 (12.7)	
I report high blood pressure to the pharmacist	65 (63.7)	10 (9.8)	9 (8.8)	18 (17.6)	

Table 2 revealed that 50 (49.02%) respondents had above average knowledge level of hypertension, 30 (29.41%)

had average knowledge level and 22 (21.57%) had below average knowledge of hypertension. The overall mean

score of the knowledge level among hypertensive diabetics was 54.01 and when transformed into percentage it is 65.9%. The knowledge level of the hypertensive diabetics could be said to be above average. Table 3 showed the respondents self-care maintenance practices in which 82.4% respondents daily limit amount of salt in their diets, 42.2% substitute their meal for fresh fruit daily, 65.7% eat fiber rich food daily, 72.5% daily

limit their carbohydrate intake, while 12.7% drink more than 2 bottles of alcohol daily. Also, 7.8% of respondents smoke daily, 48% do have 30 minutes of daily moderate exercise, 38.2% take vitamins C supplement daily, 66.6% take potassium rich food at least thrice weekly, 68.6% daily avoid fatty foods, 24.5% prefer vegetable oil to palm oil in their daily cooking, and 39.2% undergo daily stress.

Table 4: Summary of control practices of hypertension.

Categories	Criteria	Frequency	Percentage	Remark
117-174	Good practices	46	45.1	Number of the respondents with good control practices of hypertension
59-116	Fair practices	25	24.5	Number of the respondents with fair control practices of hypertension
1-58	Poor practices	31	30.4	Number of the respondents with poor control practices of hypertension

Mean=94.18 (54.1%), SE of Mean=1.88, Std. dev=18.99

Table 4 revealed that 46 (45.1%) respondents had good control practices level, 25 (24.5%) had fair practices and 31 (30.4%) had poor practices of hypertension. The overall mean score of the control practices level among hypertensive diabetics was 94.2 and when transformed into percentage it is 54.1%. The control practices level of the hypertensive diabetics could be said to be fair.

DISCUSSION

The overall knowledge level of hypertension among the hypertensive diabetics was above average. The only reason that can be adduced for the knowledge level of hypertension to be above average may be as a result that majority of the respondents have been diabetics for a minimum of 10 years, and have been under the same health education section for both hypertension and diabetes. This might be an added advantage of knowing more about the subject matter. This overall knowledge level is in tandem with the findings of previous researchers like Tahir et al who recorded 71% knowledge score in his study on knowledge, attitude and practices of patients regarding diabetes and hypertension control.¹⁶

Aghoja et al also recorded that the respondents knowledge level was good with majority of patients knowing what a normal blood pressure should be, but still misunderstood the signs and symptoms of hypertension complication for hypertension.¹⁷ But, it contradicts the findings of Gnanaselvam et al who reported overall inadequate knowledge score of less than 50%.¹⁸ Specifically, this study found that majority of the respondents knew that overweight, 87.3% respondents took more than 1.5 mg daily salt consumption can prevent blood pressure control. This is in tandem with the findings of Gnanaselvam et al who found that 76.0% and

81.1% respondents agreed that weight and salt reduction are method of controlling hypertension.¹⁸ Also, the study revealed that respondents agreed that compliance with both antihypertensive and antidiabetic drugs could assist in blood pressure control yet majority (40.2%) still also agreed that herbal mixture can control blood pressure. This might be because of the cultural belief in herbal concoction that dominates this geographic area. The study revealed that most (72%) respondents agreed that antihypertensives should be used for life. This contradicts the findings of Aghoja et al who found that majority of respondents do not accept that the use of anti-hypertensive is for life.¹⁷

The outcome of the second research question revealed that the control practices level among hypertensive diabetics is fair. This tallies with the findings of Aghoja et al where only 41.8% respondents checks their blood pressure regularly and only 19.6% of those that check their blood pressure daily records it, out of 47.1% that check blood pressure alone at the clinic only 28.4% records it.¹⁷ Also, 53.9% of the respondents in this study check their blood sugar daily while 51% records it daily. Below average number of 50 (49%) adjust their meal base on blood sugar value. This is in support of Tahir et al who found the practice score of hypertensive and diabetic patients on their conditions are lower with 51% for the hypertensives and 42.5% for the diabetics.¹⁶

This study found an almost the same practice score for the hypertensive diabetics. With only 45.1% respondents having a good practice score. Similarly, although majority (72.5%) of respondents monitor weight at least monthly and 81.3% and records it, 49% never monitors their urine and 36.3% do not consider dietary adjustment when they gain weight. 76.5% respondents always keep

their clinic appointments, 64.7% goes to the clinic when they are not fine. 63.7% report high blood glucose to the doctor, 65.7% report high blood pressure at the pharmacy. While majority (85.3%) of respondents still accept and uses herbal mixture to control hypertension. This does not tallies with the findings of Amadi et al who recorded a higher respondents preference of being managed by the doctors or to report at the clinic than the chemist.¹⁹ This practice might be due to cultural influence as Osogbo people prefers to take herbal concoction in the care of any disease. This might be the cause of their preference for pharmacy patronage (81.3%) when they are to check blood pressure as some of this trained pharmacies also sells herbal concoction along with orthodox medicine.

CONCLUSION

Every hypertensive diabetics faces a greater risk of cardiovascular complications with uncontrolled blood pressure because of the combined effect of diabetes and hypertension on the blood vessels. The knowledge and application of hypertension control practices has been found to control blood pressure and prevent macro and microvascular complications of hypertension. Knowledge and control practices of hypertension is a broad concept that comprises of the knowledge of risk factors of hypertension, sign and symptoms and complications of hypertension as related to diabetes.

It also incorporates the co management of hypertension and diabetes so as to enhance blood pressure control and reduces the complications of the comorbidity that leads to higher mortality and morbidity rate. This study concludes that the knowledge level of hypertension among the hypertensive diabetics was above average, hypertension control practice level is fair. Therefore efforts to increase the knowledge and control practices of hypertension should not focus only on general health education, but individual specific knowledge needs.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee of LAUTECH Teaching Hospital, Idiseke, Osogbo, Osun State, Nigeria

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