Profile of Blood Pressure Control and Other Comorbidities Among Medical Outpatients Attending A University Teaching Hospital, South-South Nigeria

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Abstract

Background: Hypertension is the commonest non-communicable diseases worldwide. Patients suffering from this condition may also have other co-morbidities.
Aim: To show the profile of blood pressure control among patients attending the Consultant Medical Out-Patient Department (MOPD).

Methodology: A retrospective descriptive study of MOPD clinic attendees with hypertension. Patients aged 18 years and above who had both their first and sixth clinic visits between November 2012 and November 2013 were recruited for the study.

Results: A total of 150 subjects were enrolled with a mean age 58.3±13.0 years, and 68 (45.3%) were males. The mean SBP, DBP and pulse rates at first and sixth visits were 145.8(±23.3) mmHg, 87.8(±14) mmHg and 83.1(±15.1) bpm, and 138.0(±22.9) mmHg, 84.5(±12.9) mmHg and 80.9(±13.4) bpm, respectively. By the third clinical visit, 67% of the study population had attained target blood pressure control.
One hundred and fourteen (76.0%) of the study population had co-morbidities and complications (diabetes, dyslipidaemia, heart failure, hypertensive heart disease).
All the patients with dyslipidemia were placed on lipid lowering drugs but no repeat test was done during the study period.
About 7.3% of the population had adverse drug reactions such as headaches, dizziness, generalized body pains and nausea.

Conclusion: Only 67% of the subjects attained target blood pressure control by the third visit. There is need for more aggressive approach in managing patients with hypertension. It is important to document adverse drug reactions and follow the recommended pharmacovigilance protocol.

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Background

Cardiovascular diseases are a common and important global public health challenge. It accounts for nearly a third of all-cause mortality worldwide and is the commonest non-communicable disease in developing countries like Nigeria.[1-5] Patients suffering from this condition also have other co-morbidities such as diabetes, dyslipidemia, arthritis etc.[5] The treatment for hypertension is lifelong and it has been shown that a number of patients do not achieve control of blood pressure for several reasons.[6-12] Drugs used to treat this condition have been shown to have some side effects and there are possibilities of drug- drug interactions especially with most patients needing more than

one antihypertensive medication with these effects occurring due to factors such as age, presence of comorbidities and subsequent multidrug therapy arising from their presence.[13,14]

It is sad that a large population of people in Nigeria are currently undiagnosed and it is sadder still that amongst those diagnosed only a few have their blood pressure controlled.[15] The major problem is attributed to lack of adherence to medications on the side of patients as many patients dislike the use of anti-hypertensives and the presence of a high blood pressure that is usually asymptomatic.[16] Other contributing factors may be inadequate assessment and adherence to standard treatment guidelines on the part of the managing physician or both.[17] Furthermore is the role of healthcare systems that are not optimally functional in Nigeria.[17]

The healthcare system usually points the finger at the patients blaming them for their poor blood pressure control. Some of these patients have co-morbidities that are poorly addressed by physicians with some patients being cared for by poorly trained medical personnel especially in local community settings. Previous studies have argued that blood pressure control should be individualized to determine the desired cut off for each patient using a host of clinical criteria to accommodate for scenarios where the target blood pressure control cannot be fully achieved such as in some patients with resistant hypertension, co-morbid terminal illnesses and diabetes.[12,18-20] Currently, how much of percentage control is achieved is unknown to physician with percentage control varying from country to country with very poor performances recorded in developing countries like Nigeria.[21] The availability of such data will help clinicians evaluate their methods including nutrition and diet counselling / lifestyle modifications as well as antihypertensive therapy and towards expectations in patient with comorbidities. The unanswered question is with the current trends and management protocols how much control have we achieved for our patients? Are we winning? Are we factoring in the presence of comorbidities individualized to patients?

This study seeks to assess the profile of blood pressure control among patients with or without existing comorbidities attending consultant medical outpatient clinic with focus on how many patients were able to meet with blood pressure targets and controls on assessments during follow up visits.

Methodology

The study was carried out in Delta State University Teaching Hospital (DELSUTH), Oghara, Ethiope West Local Government area of Delta State, Nigeria. It is the only tertiary hospital owned by the Delta State Government and serves as the main referral hospital within the State. Patients are also referred to DELSUTH from the neighboring States of Edo and Bayelsa.

This is a descriptive cross-sectional study. We retrospectively studied hypertensive patients on antihypertensive medications with or without co-morbidities who had visited the consultant medical outpatient department (MOPD).

All adult patients aged ≥18years who are hypertensive irrespective of duration of diagnosis and presence of co-morbidities, presenting in DELSUTH MOPD for the first time within the period of November 2012 to November 2013, on antihypertensive medications and had at least 6 clinic visits within this period were recruited for the study.

Patients who were aged less than 18 years, and those who have attended the MOPD for a period less than one year as well as those having less than 6 clinic visits within the year of interest were excluded from the study. Individuals with mild hypertension who were receiving dietary /lifestyle modification, but not on anti-hypertensive medications were excluded from the study. The first clinic visit is notably the next visit after a

patient has been placed on antihypertensive medications in the previous visit and not necessarily the first day the patient presents to the clinic.

Hypertension was defined as a systolic blood pressure ≥140mmHg or a diastolic blood pressure of ≥ 90mmHg.[22] The goal/target of blood pressure control for the age range studied was said to be achieved if the clinic blood pressure was <140/90mmHg for all patients including hypertensive-diabetics.[22]

Subjects who met the inclusion criteria were recruited for the study. A structured proforma was used to capture data from the patients' medical records. Sociodemographic data on age, sex, ethnicity, marital status, religion and occupation were obtained from the case note. The blood pressure readings and pulse rates for the clinic visits of interest were also obtained from the case notes. For each subject, the duration of hypertension, the working diagnosis and the presence of co-morbidities were noted. Fasting blood sugar and fasting serum lipid profile levels were recorded from the case notes.

The presence of diabetes mellitus was defined as fasting blood sugar ≥126mg/dl while good glycaemic control was set at a random blood sugar of 140mg/dl or glycated haemoglobin (HbA1C) <6.5%.[23] The cut-off levels for abnormal total cholesterol, high density lipoprotein (HDL), low density lipoprotein (LDL) and triglyceride (TAG) necessitating specific interventions were set at >240mg/dl, <40mg/dl, >160mg/dl and >150mg/dl, respectively.[24]

Ethical approval was sought and obtained from the Health Research Ethics Committee of the Delta State University Teaching Hospital, Oghara.

Data Analysis

The data obtained was entered and analyzed using Statistical Product and Service Solutions (SPSS) version 22.0 software (SPSS Inc. Chicago, Illinois, USA). Categorical data were expressed as frequencies and percentages while numerical data were expressed as mean and standard deviation. Means were compared using the independent t-test. A p-value of <0.05 was considered statistically significant. Tables and charts were drawn using Microsoft Excel 2010.

Results

A total of 150 subjects were recruited for this study with a male to female ratio of 1:1.2. The age distribution of subjects is shown in figure 1. The age range of the subjects was 25 – 105 years with a mean age of 58.3 (±13.0) years.

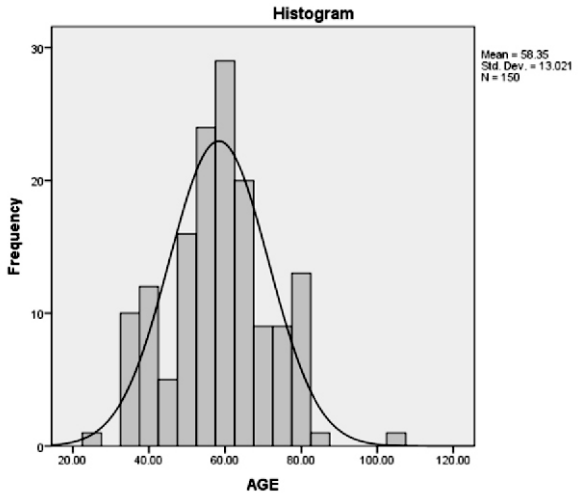


Figure 1. Age distribution of Subjects

Table 1 shows the socio-demographic characteristics of the study population. About one-third of the study participants were in the 50-59 years age bracket. Majority of the study population were Urhobos (70.0%) and businessmen or traders (42.7%). One-fifth of the study population were unemployed.

Table 1. Sociodemographic characteristics of study population

Variable	Category	Frequency [n (%)]
Age Group (years)	<30	1 (0.7)
	30 – 39	13 (8.7)
	40 – 49	18 (12.0)
	50 – 59	52 (34.7)
	60 – 69	38 (25.3)
	70 – 79	20 (13.3)
	-	8 (5.3)
Sex	Male	68 (45.3)
	Female	82 (54.7)
Ethnicity	Urhobo	105 (70.0)
	Isoko	5 (3.3)
	Ijaw	10 (6.7)
	Itsekiri	10 (6.7)
	Ibo	10 (6.7)
	Others	10 (6.7)
Occupation	Business/Trading	64 (42.7)
	Civil service	15 (10.0)
	Driving	10 (6.7)
	Farming/Fishing	10 (6.7)
	Teaching	21 (14.0)
	Unemployed	30 (20.0)

Biophysical profile

At the first clinic visit, majority (66.7%) of the study participants had systolic blood pressure (SBP) ≥140mmHg while 46.0% had diastolic blood pressure (DBP) ≥90mmHg. (Table 2)

The mean (±SD) values for total cholesterol (TC), high density lipoprotein (HDL), low density lipoprotein (LDL) and triglycerides (TAG) obtained in this study were 197.55 (±43,06) mg/dl, 56.62 (±14.57) mg/dl, 117.5 (±43.98) mg/dl and 117.14 (±43.78) mg/dl, respectively. Dyslipidaemia was noted in 56 (37.3%) of the subjects.

The frequency of abnormal lipid profile parameters (TC, HDL, LDL, TAG) is as shown in table 2.

Table 2: Biophysical profile of study participants at first visit

Variable	Category	Gender Distribution		Total (%)
		Male	**Female**	
Age Group (years)	<30	1	0	1 (0.7)
	30 – 39	5	8	13 (8.7)
	40 – 49	11	7	18 (12.0)
	50 – 59	19	33	52 (34.7)
	60 – 69	14	24	38 (25.3)
	70 – 79	12	8	20 (13.3)
	≥80	6	2	8 (5.3)
SBP (mmHg)	<120	4	6	10 (6.7)
	120 – 139	18	22	40 (26.7)
	140 -159	24	21	45 (30.0)
	≥160	22	33	55 (36.7)
DBP (mmHg)	<80	16	19	35 (23.0)
	80-89	23	22	45 (30.0)
	90-99	11	24	35 (23.0)
	≥100	18	17	35 (23.0)
Pulse rate (bpm)	<60	1	4	5 (3.4)
	60 – 100	58	67	125 (83.3)
	>100	9	11	120 (13.3)
Abnormal lipid profile (mg/dl)	TC (>200)	25	26	51 (34.0)
	HDL (<40)	15	16	31 (20.7)
	LDL (>160)	22	16	38 (25.3)
	TAG (>150)	19	19	38 (25.3)

DBP: Diastolic Blood Pressure, **SBP:** Systolic Blood Pressure, **HDL**: High Density Lipoprotein, **LDL:** Low Density Lipoprotein, **TAG:** Triacylglyceride, **TC**: Total Cholesterol.

Attaining Blood Pressure Control

The mean (±SD) systolic blood pressure, diastolic blood pressure and pulse rate were 145.8 (±23.3) mmHg, 87.8 (±14) mmHg and 83.1 (±15.1) bpm respectively at the initial clinic visit and 138.0 (±22.9) mmHg, 84.5 (±12.9) mmHg and 80.9 (±13.4) bpm respectively at the sixth clinic visit. The mean difference in systolic and diastolic blood pressures of subjects between their first and sixth clinic visits were statistically significant [SBP: t= 2.911 (95%CI = 2.516 – 13.018), p=0.004; DBP: t=2.105 (95% CI = 0.213 – 6.334), p = 0.036).

About two-thirds of the study population attained normal blood pressure control by their third clinic visit while 3% attained control at their sixth clinic visit. (Figure 2)

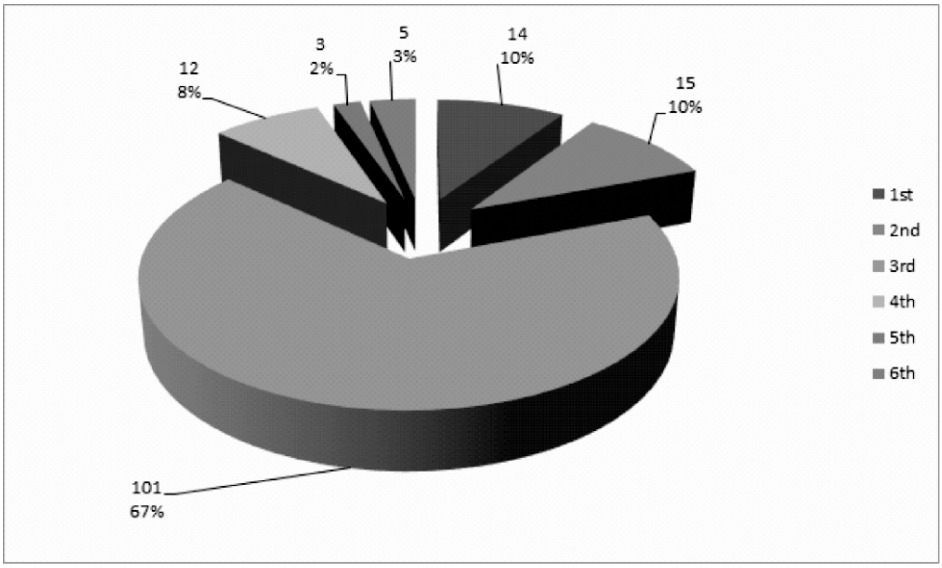
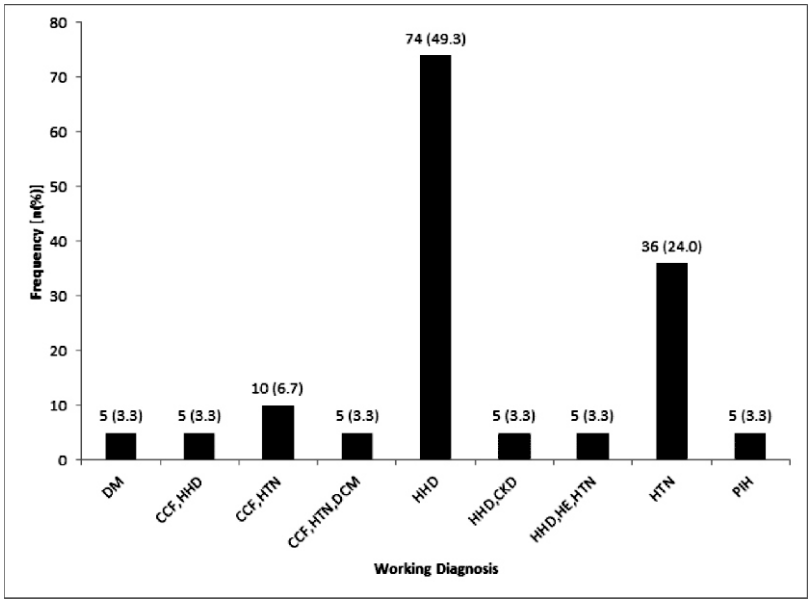


Figure 2. Number of Clinic visits before attaining normal blood pressure control

Co-Morbidities

Co-morbidities and drug-related adverse effects also had roughly equal frequency among males and females of the population with their peak frequency within the 50-59 years age group.

At presentation, 36 (24.0%) of the study population had uncomplicated hypertension with no other co-morbidities. Figure 3 shows the working diagnosis of the study population at their first visit.



CCF=Congestive Cardiac Failure; CKD= Chronic Kidney Disease; DCM= Dilated cardiomyopathy, DM =Diabetes;

HHD= Hypertensive Heart Disease; HE= Hypertensive Encephalopathy; HTN= Hypertension; PIH= Pregnancy Induced Hypertension; .

Figure 3. Showing the working diagnosis among study participants

Adverse Drug Reaction

Less than one-tenth of the study population had adverse drug reactions to antihypertensive medications. (Figure 3). Amongst the adverse effects recorded were headaches, dizziness, generalized body pains and nausea. None of these adverse effects were reported as per pharmacovigilance protocol.

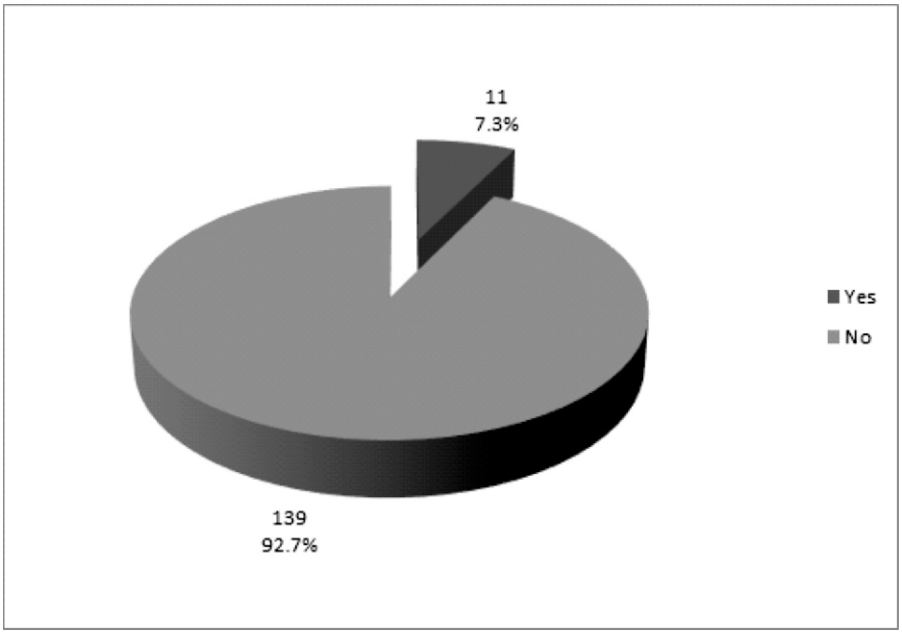


Figure 3: Showing adverse effect to antihypertensive medications among study participants

Discussion

Hypertension in Blacks has long been recognized as occurring earlier in life, more severe and having closer links to pressure-related target organ injury such as left ventricular hypertrophy, chronic kidney disease and heart failure than in Caucasians.[25,26.]

This study revealed a mean age of 58.3 (±13.0) years among the study population. This is similar to findings from other studies in Nigeria.[27,28] Aging is associated with an increased onset of atherosclerosis renovascular hypertension, and renal insufficiency. Thus, hypertension becomes more prevalent as individuals grow older.[29] The age group distribution in this study is unimodal with a single peak and tailing off at extremes of the age groups. This age distribution is however not surprising considering that this study is hospital based. Although not assessed in this study, lack of awareness of hypertension and the danger it portends results in delayed presentation and under-utilization of healthcare facilities, especially by young adults.[28-30]

Similar to previous reports,[31] this study showed a significant reduction in the mean values of systolic and diastolic blood pressures of subjects between the first and the sixth clinic visits for each of the study participant. However, compared to findings by Olanrewaju et al.[31] at University of Ilorin Teaching Hospital the mean difference

between the initial and last SBP and DBP were lower in this study. Their initial and last SBP and DBP were 154(±28) mmHg and 133(±21)mmHg, and 95(±17)mmHg, and 80(±12)mmHg, respectively.[31] The observed difference in blood pressure reduction may be due to the higher starting blood pressures in the Ilorin study.

By the third clinic visit, majority of the subjects in this study had attained target blood pressure control. This however is contradicted by Akpa et al in Port Harcourt, Nigeria who reported a blood pressure control rate of 24.2% at the third clinical visit. The observed lower rate of blood pressure control may be due to the duration of the study rather than poorer blood pressure control. While it was 3 months for Akpa et al.,[32] it was 1 year for the index study. Educational interventions including lifestyle modification are usually instituted and achieved over time.[33] Better blood pressure occurs when patients know more about hypertension which can only be achieved with repeated continuous patient education,[34] a probable reason for the findings in this study.
Seventy six percent of subjects in this study had co-morbidities at presentation. Several reasons may be adduced. Patients with hypertension are often asymptomatic and many are unaware of their blood pressure readings. This is a driver for late diagnosis and presentation with complications. Notably, hypertension seldomly exists without the presence of comorbidities such as diabetes, obesity and dyslipidaemia.[35] Also, the index study was conducted in a tertiary health facility and it is not unexpected for patients with co-morbidities to be referred to such centres for further cardiovascular care.

Although, all the patients with dyslipidemia were placed on lipid lowering drugs none had a repeat lipid profile test done during the study period. This may be due to physician's inertia or lack of finance on the part of the patient to do a repeat test. These inferences are however not generalizable considering the retrospective study design and lack of supportive information from subjects' medical records. Although, some studies have highlighted the fact that it may be expensive for the patients to have regular monitoring of their blood profile and others have stated that most physicians are not used to following standard guidelines in managing patients.[36-39] This certainly portend bad outcome for the patients and poor feedback to the primary care doctor. A study to show the long-term effects of these practices will be crucial as doctors will be better positioned and informed to adhere to standard guidelines.

Also noted is the fact that most of the adverse effects reported were not addressed accordingly. The standard protocol of reporting these cases (pharmacovigilance) was not followed. This again brings to bear the need for primary care physicians to add to the body of knowledge by ensuring accurate reporting of adverse effects from medicines. Some studies have highlighted this problem and recommendations have been made to ensure effective education of doctors on the need to report adverse effects and to make the adverse drug reaction forms readily available to the caregivers.[40,41] Futhermore, it is noteworthy that patients who experience side effects may over report their adherence especially when speaking to a doctor they know.[42,43]

Conclusion

This study shows that 67% of the subjects with hypertension attained target blood pressure control by the third clinic visit. Also, 76% of the study population had documented evidence of co-morbidities (target organ damage and associated clinical conditions) as at presentation. There is need for more aggressive primary and secondary prevention of hypertension through

continuing health education and health promotion activities at various ecological levels.
This study is limited in its retrospective and tertiary hospital-based design. The small sample size in this study also limit the generalization of observations and inferences made.

References

1. Copper R, Rotimi. Hypertension in Blacks. Am J Hypertens 1997;10:804-812
2. Akintunde AA, Oyedeji AT, Opadijo OG. Clinical and echocardiographic determinants of diastolic dysfunction among Nigerian hypertensive subjects. Nig J Cardiol 2013;10:9-13
3. Umuerri EM, Aigbe FI, Aiwuyo HO, Obasohan AO. Pattern of Cardiac Diseases and Diagnostic Utility of Transthoracic Echocardiography in Delta State University Teaching Hospital, Oghara, Nigeria. Afr. J. Trop. Med. & Biomed. res 2015;2(2):30-37.
4. Adegbunde DO, Mathers CD, Adan T, Ortegon M, Strong K. The burden and costs of chronic diseases in low-income and middle-income countries. Lancet 2007;370(9603):1929-1938.
5. Debussche X, Balcou-Debussche M, Baranderaka NA, Ndariorere S, La Haussee de Lalouviere V, Nitunga N. Community health education network for the prevention of cardiovascular disease and diabetes in Burundi: development and first results. Glob Health Promot 2010;17(2 Suppl):68-75.
6. Perry HM, Neal HW. Complications of hypertensioin and their relation to therapy In: Perry HM ed. Developments in Cardiovascular Medicine: Lifelong management of hypertension. Springer : Netherland.1983: 150-170.
7. Calhoun DA, Jones D, Textor S, Goff DC, Murphy TP, Toto RD, et., al. Resistant Hypertension: Diagnosis, evaluation and treatment: a scientific statement from the American Heart Association Professional Education Committee of the council for High Blood Pressure Research. Hypertension 2008; 51(6):1403-1419. Doi:10.1161/HYPERTENSIONAHA.108 .189141
8. Sarafidis PA, Bakris GL. Resistant Hypertension: An overview of evaluation and treatment. J Am Coll Cardiol 2008;52(22):1749 – 1757.
9. Alderman MH. Resistant Hypertension: A clinical syndrome in search of a definition. Am J Hypertens 2008;21(9):965-966.
10. Epstein M. Resistant Hypertension: prevalence and evolving concepts. J Clin Hypertens 2007;9(1):2 – 6.
11. Pisoni R, Ahmed MI, Calhoun DA. Characterization and treatment of resistant hypertension. Curr Cardiol Rep 2009;11(6):407-413.
12. Steinman MA, Goldstein MK. When tight blood pressure control is not for everyone: a new model for performance measurement in hypertension. Jt Comm J Qual Patient Saf 2010;36(4):164-172.
13. Tsang Cheung T, Man Yung Chueng B. Identifying patients with resistant hypertension and options for clinical management. Future Cardiol 2012;8:837 – 846.
14. Silva D, Matetei UV, Neerati VM, Thiruthopu NS, Martha S. Assessment of drug-drug interactions in hypertensive patients in a superspecialty hospital. Avicenna J Med 2015;5: 29-35.
15. Ulasi I, Ijoma CK, Onwubere BJC, Arodiwe E, Onodugo O, Okafor C. High prevalence and low awareness of hypertension in a market population in Enugu, Nigeria. Int J Hypertens 2011; 2011: 869675.
16. Ogah OS, Okpechi I, Chukwuonye II, Akinyemi JO, Onwubere BJC, Falase AO, et al. Blood pressure, prevalence of hypertension

and hypertension related complications in Nigerian Africans: A review. World J Cardiol 2012;4:327-340
17. Clement DL. Poor blood pressure control: what can we do? J Hypertens 2017;35(7):1368 – 70.
18. Ardrey G. Explicit and implicit evaluation of physician adherence to hypertension guidelines. J Clin Hypertens 2007;9:113-119.
19. Kerr EA. The role of clinical uncertainty in treatment decisions for diabetic patients with uncontrolled blood pressure. Ann Intern Med 2008;20(148):717-727.
20. Walter LC, Covinsky KE. Cancer screening in elderly patients: a framework for individualized decision making. JAMA 2001;285: 2750-2756.
21. Redon J, Mourad JJ, Schmeider RE, Volpe M, Weiss T. Why in 2016 are patients with hypertension not 100% controlled? A call to action. J Hypertens 2016;34:1480-1488.
22. James PA, Oparil S, Carter BL, Cushman WC, Dennison-Himmelfarb C, Handler J, et al. 2014 Evidence-based guideline for the management of high blood pressure in adults: report from the panel members appointed to the Eight Joint National Committee (JNC8). JAMA 2014;311(5):507-520. Doi: 10.1001/jama.2013.284427
23. Monnier L, Colette C. Target for glycaemic control concentrating on glucose. Diabetes Care 2009;32(Suppl 2):S199-S204. Doi: 10.2337/dc09-S310
24. Grundy SM, Stone NJ, Bailey AL, Beam C, Birtcher KK, Blumenthal RS, et al. AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PNCA Guideline on the management of blood cholesterol: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. J Am Coll Cardiol 2018 pii: S0735-1097(18)39033-8. doi: 10.1016/j.jacc.2018.11.002. [Epub ahead of print]
25. Flack JM, Ferdinand KC, Nasser SA. Epidemiology of hypertension and cardiovascular diseases in African-Americans. J Clin Hypertens 2003;5:5-11
26. Flack JM, Sica DA, Bakris G, Brown AL, Ferdinand KC, GrimmJr RH, et al. Management of high blood pressure in Blacks. Hypertension 2010;56:780-800. doi: 10.1161/HYPERTENSIONAHA.110.152892
27. Onwuchekwa AC, Chinenye S. Clinical profile of hypertension at a University Teaching Hospital in Nigeria. Vasc Health Risk Manag 2010;6:511-516. doi:10.2147/VHRM.S10245
28. Iyalomhe GBS, Iyalomhe SI. Hypertension-related knowledge, attitudes and lifestyle practices among hypertensive patients in a sub-urban Nigerian community. J Public Health Epidemiol 2010;2:71-77
29. Anderson GH. Effect of age on hypertension: analysis of over 4800 referred hypertensive patients. Saudi J Kidney Dis Transpl 199;10 (3):286-297.
30. Johnson HM, Thorpe CT, Bartels CM, Schumacher JR, Palta M, Pandhi N, et al. Undiagnosed hypertension among young adults with regular primary care use. J Hypertens 2014;32(1):65-74
31. Olanrewaju TO, Aderibigbe A, Chijioke A, Sanya EO, Busari OA, Kolo PI, et al. Descriptive analysis of blood pressure among treated hypertensive patients in a tertiary hospital in Nigeria. Afr J Med Sci 2011;40:207-212
32. Akpa MR, Alasia DD, Emem-Chioma PC. An appraisal of hospital-based blood pressure control in Port-Harcourt, Nigeria. The Nigerian Health Journal 2008;8:27-30.

33. Adebolu FA, Naidoo M. Blood pressure control amongst patients living with hypertension presenting to an urban district hospital outpatient clinic in Kwazulu-Natal. Afr J Prim Health Care Fam Med 2014;6 (1):E1 - E6.
34. Kim EY, Hans HR, Jeong S et al. Does Knowledge matter? International medication non adherence among middle-aged Korean Americans with high blood pressure. J Cardiovasc Nurs 2007;22(5):397-404.
35. Ventura HO, Lavie CJ. Impact of morbidities in hypertension. Curr Opin Cardiol 2016;31(4):374-375.
36. Dorobantu M, Darabont R, Ghiorghe S, Babes K, Pop D, Toma D, et al. Profile of the Romanian hypertensive patent data from SEPHAR II study. Rom J Intern Med 2012;50:285-296
37. Axt-Adam P, van der Wouden JC, van der Does E. Influencing behaviour of physicians ordering laboratory tests: a literature study. Med Care 1993;31:784-794
38. Beck JR. Does feedback reduce inappropriate test ordering? Arch Path Lab Med 1993;117:33-34
39. Finkler SA. The distinction between cost and charges. Ann Intern Med 1982;96:102-109
40. Johnson SS, Fakeye TO. The concept of adverse drug reaction reporting: awareness amongst pharmacy students in a Nigerian University. Internet Journal of Medicine Update 2013;8:24-30
41. Vallano A, Cereza G, Arnau JM. Obstacles and solutions for the spontaneous reporting of ADRs in the hospital. Br J Clin Pharmcol 2005;60:653-658.
42. Svarstad BL, Chewning BA, Sleath BL, Claesson C. The brief medication questionnaire: A tool for screening patient adherence and barriers to adherence. Patient Educ Couns 1999;37(2):113–124.
43. Voils CI, Hoyle RH, Thorpe CT, Maciejewski ML, Yancy Jr WS. Improving the measurement of self-reported medication nonadherence. J Clin Epidemiol 2011;64(3):250–254.

Citation: this article should be cited as. *Ohaju-Obodo JO, Aiwuyo HO, Umuerri EM, Aigbe FI.* Profile of Blood Pressure Control and Other Comorbidities Among Medical Outpatients Attending A University Teaching Hospital, South-South Nigeria. Afr. J. Trop. Med. & Biomed. Res 2019; 4 (2): 51-61