



Pattern of Antihypertensive Prescription at Abia State University Teaching Hospital, Aba, South East Nigeria

Onwuchekwa UN¹, Okoronkwo NC^{2*} and Uzor EI¹

¹Department of Medicine, Abia State University Teaching Hospital, Aba, Abia State, Nigeria

²Department of Paediatrics, Abia State University Teaching Hospital, Aba, Abia State, Nigeria

*Corresponding Author: Okoronkwo NC, Nephrology Unit, Department of Paediatrics, Abia State University Teaching Hospital, Aba, Abia State, Nigeria.

Received: April 06, 2020

Published: May 04, 2020

© All rights are reserved by Asit Kumar Chakraborty.

Abstract

Background: Hypertension is a major contributor to cardiovascular disease burden worldwide. This study was therefore set to assess the pattern of anti-hypertensive prescriptions among adults hypertensive patients attending the Abia State University Teaching Hospital (ABSUTH), Aba, Nigeria.

Methods: This was a retrospective observational review of case notes of hypertensive patients that attended the medical outpatient unit of our hospital over a one-year period.

Results: A total of 204 case notes were analyzed. The mean age of patients was 58.66yrs. Female patients (60.3%) were more than males (39.7%) giving a Male: Female ratio of 1: 1.5. Majority of the patients had mild hypertension (43.6%) followed by moderate hypertension 35.9%, and severe hypertension 20.5% respectively. The most prescribed class of Monotherapy drugs was calcium channel blockers, followed by Angiotensin receptor blockers, while the least prescribed was a thiazide diuretic. A two-drug combination was the most prominent in the multi-drug combinations therapy. A combination of calcium channel blocker and Angiotensin receptor blocker was the most prescribed two-drug combination.

Conclusion: The most prescribed Monotherapy class of antihypertensive drug in ABSUTH is a calcium channel blocker while the least a thiazide diuretic.

Keywords: Hypertension; Cardiovascular Disease; Anti-Hypertensive Prescriptions

Introduction

Hypertension is a major public health concern globally. It is one of the most important and most frequent cause of cardiovascular morbidity and mortality in sub-Saharan Africa [1].

In Nigeria the posted prevalence of hypertension has increased significantly in the last four decades from 8.9% to 22.2% [2]. Hypertension - related diseases account for 20.5% to 69.6% of the total admitted medical cases in various studies across Nigeria, with a high rate of mortality of up to 42.9% [3,4].

Hypertension has been reported to be the strongest modifiable risk factor for cardiovascular health morbidity and mortality burden. Worldwide, the prevalence of hypertension has been estimated to be as much as 1 billion individuals and approximately 7.1 million deaths per year may be attributed to hypertension [5].

It has been projected that the global prevalence of hypertension would increase from 26.6% in 2000 to 29.2% in 2025, with Africa having the highest prevalence (46%) in the world.

In Nigeria the pooled prevalence of hypertension has been put at 22.5% with higher rate of 32.7% found in urban areas. Ekwunife, *et al.* [6] has reported that the proportion of hypertensive pa-

tients on treatment in Nigeria ranges from 18.6% to 21% and that blood pressure was controlled in only 10% of those treated.

Pattern of antihypertensive prescription in systemic hypertension vary from one healthcare facility to another, and from one part of Nigeria to another. It has been suggested that factors responsible for the various pattern of prescription include, availability of drugs, affordability (cost), preference of the healthcare facility and doctors and the existing policy guiding the procurement of drugs [7].

Treatment of systemic hypertension includes pharmacotherapy, as well as non-pharmacologic therapies like, life style modification. Drugs used for treatment of hypertension have been conveniently grouped on the basis of mechanism of and/ or site of action and further differentiated using their chemical classes.

The most commonly prescribed antihypertensive drugs include Thiazide and Thiazide-like diuretics, centrally acting sympatholytic drugs, Ganglion blockers, Adrenergic receptor blockers, Beta adrenergic receptor blockers, Alpha adrenergic receptor blockers, mixed alpha and beta adrenergic blockers, Calcium channel blockers, Vasodilators, Angiotensin Converting Enzyme (ACE) inhibitors, Angiotensin 11 Receptor blockers and Renin inhibitors.

This study was therefore set to review the prescription pattern of antihypertensive drugs among adult patients with hypertension attending the Abia State University Teaching Hospital (ABSUTH) Aba, Abia State.

Materials and Methods

This was a retrospective study carried out at the Abia State University Teaching Hospital Aba. The Teaching Hospital is the only tertiary health institution located in the metropolis of Aba, Abia State. It is specifically located in Osisioma Local Government Area, of Abia State.

ABSUTH serves as a general/referral centre for patients resident in Aba metropolis, and adjoining cities and communities. The medical outpatient department runs 5 days (Monday to Friday) a week and is being manned daily by different subspecialty units consisting of different cadres of doctors but headed by consultants. Medical cases are seen during weekends at the emergency rooms by doctors on call. The case notes of the patients that attended the medical outpatient clinic of ABSUTH from January 2016 to December 2017, were retrieved from the Medical Records Department of the hospital. The patients’ bio data, duration/severity of hypertension, and co-morbidities were recorded. Patients less than 18 years of age and those with heart failure were excluded from the study. Data entry and analysis was carried out using the IBM SPSS version 20 on a personal computer. Categorical data are presented as proportions and percentages while continuous variables are expressed as means (+/- standard deviation). P-value of 0.05 is considered significant. Ethical approval was sought and obtained from the ABSUTH Ethical Committee.

Results and Discussion

A total of 204 patients aged 21 - 97 years with a mean age of 58.66 ± 13.39 years were reviewed. There were 81 males (39.7%) and 123 (60.3%) females, giving a male: female ratio of 1:1.5. More than 60% of these patients had at least secondary level of education (Figure 1).

More than 60% of these patients had suffered hypertension for

less than 5 years, while only 5.9% has been hypertensive for more than 10 years (Table 1). Majority of the patients had mild hypertension (Figure 2).

Duration (Years)	Frequency	Percentage (%)
< 5	136	66.7
6 - 10	56	27.4
> 10	12	5.9
Total	204	100.0

Table 1: Duration of hypertension among the study population.

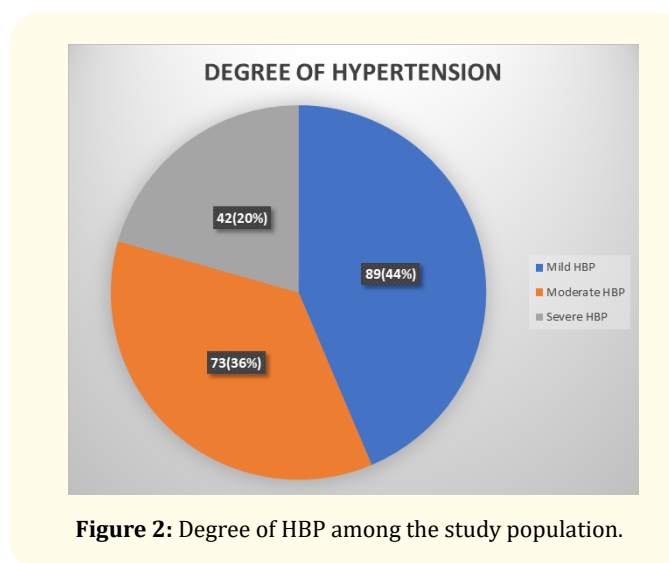


Figure 2: Degree of HBP among the study population.

Concerning the occupation of the study population, majority of the patients were traders (57.3%), followed by skilled workers (11.4%), farmers (8.8%) and students (8.3%) respectively (Table 2).

Occupation	Frequency	Percentage (%)
Traders	117	57.4
Skilled worker	23	11.3
Farmers	18	8.8
Unskilled worker	16	7.8
Professionals	13	6.4
Students	9	4.4
Clergy	5	2.5
Housewives	3	1.4
Total	204	100.0

Table 2: Occupations of the hypertensive patients.

Although up to half of the patients had no other disease co-existing with hypertension, the leading co-morbidities recorded were diabetes mellitus (17.6%), Dyslipidemias (8%), Chronic Kidney Disease (6.9%) and Cerebrovascular Disease (4.9%) (Table 3). Some patients had more than one co-morbidity co-existing with hypertension.

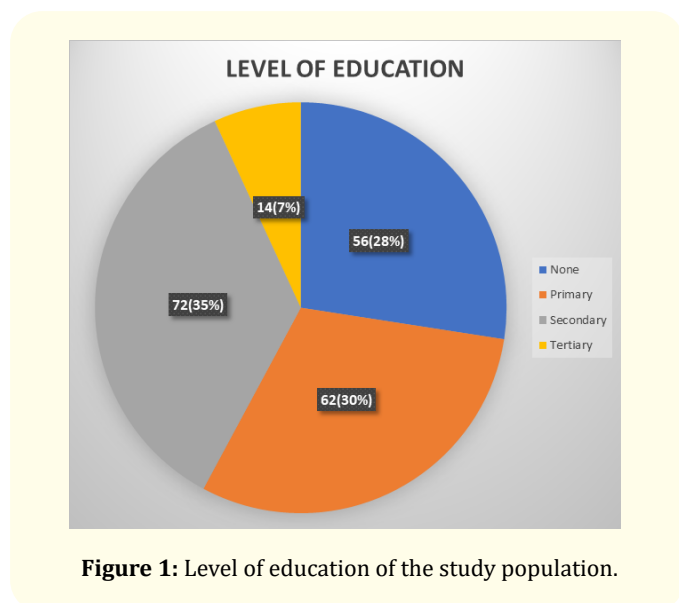


Figure 1: Level of education of the study population.

Co-morbidity	Frequency	Percentage (%)
None	122	59.8
DM	36	17.6
Dyslipidemia	16	7.8
CKD	14	6.9
CVD	10	4.9
COPD	8	3.9
IHD	7	3.4
Asthma	4	2.0

Table 3: Co-morbidities associated with hypertension.

CKD: Chronic Kidney Disease; CVD: Cerebrovascular Diseases; COPD: Chronic Obstructive Pulmonary Disease; DM: Diabetes Mellitus; IHD: Ischemic Heart Disease. Note: Some patients have more than one comorbidity.

Antihypertensive drugs prescribed among the study population was either given as a monotherapy or in combination with other antihypertensives (Table 4 and 5).

Monotherapy and combination therapy were seen in 96 (47%) and 108 (53%) of the patients respectively.

Most of the monotherapy with lisinopril was seen in diabetic patients with mild to moderate hypertension. All the diabetic patients had either lisinopril or an Angiotensin receptor blocker in their drug therapy. Determinants of multiple drug prescription were the severity of the blood pressure and the presence of comorbidities. Monotherapy with hydrochlorothiazide (HCTZ) was only seen in mild hypertension. Chronic kidney disease attracted the highest combination of antihypertensives.

The most prescribed antihypertensive monotherapy (summarized as groups of antihypertensives) were calcium channel Blockers (35.4%), angiotensin receptor blocker (33.4%), Angiotensin converting Enzyme (ACE) inhibitors (20.8%) and then hydrochlorothiazide (10.4%). See table 4.

Combination of antihypertensives in various numbers is depicted in table 5.

Monotherapy	Frequency (n = 96)	Percentage (%)
Calcium Channel Blockers	34	35.4
Angiotensin II receptor blocker	32	33.3
Angiotensin Converting Enzyme	20	20.8
Centrally Acting Sympatholytic	0	0.0
Thiazide Diuretics	10	10.4
Adrenergic Receptor Blockers	0	0.0

Table 4: Types of Antihypertensive prescribed for the study population.

Drug Combinations	Frequency (n = 108)	Percentage (%)
Two drug combinations	(65)	
ARB+CCB	22	20.4
ACEI+CCB	18	16.7
ARB+Diuretics	8	7.4
ACEI+Diuretics	7	6.4
CCB+ Diuretics	6	5.5
CCB+Methyldopa	2	1.9
ARB+Methyldopa	2	1.9
Three drug combinations	(30)	
ARB+CCB+Diuretics	12	11.1
ACEI+CCB+Diuretics	8	7.4
ARB+B+Diuretics	3	2.8
ACEI+B+Diuretics	3	2.8
ARB+CCB+Methyldopa	2	1.9
ACEI+CCB+Methyldopa	2	1.9
Four drug combinations	(13)	
ARB+B+CCB+Diuretics	4	3.7
ACEI+B+CCB+Diuretics	3	2.8
ARB+B+CCB+Methyldopa	4	3.7
ACEI+B+CCB+Methyldopa	2	1.9

Table 5: Pattern of prescribed antihypertensives in combination therapy.

ACEI: Angiotensin Converting Enzyme Inhibitor; ARB: Angiotensin II Receptor Blocker; B: -blocker; CCB: Calcium Channel Blocker.

Discussion

Hypertension is a major public health problem with high prevalence in Nigeria [11]. Prescribing patterns in systemic hypertension vary from one part of Nigeria to another, and from one healthcare facility to another within the same state or zone. Factors responsible for this include availability or non-availability of drugs, cost of drugs, preference of the healthcare facility [7].

Studies have shown that the application of guidelines to clinical practice improve the treatment outcome [12].

Also, the use of two or more drugs in controlling blood pressure has been advocated in different guideline [13].

The mean age (58.66 ± 13.39 years) of our study population is consistent with other reports that hypertension is mostly a disease of the middle age and elderly people [8,14]. More females than males were reported in our study which supports what Etuk, *et al.* found in their study [9]. However, this female preponderance contrast with findings in hypertension studies and prevalence in the general population where men are observed to be more affected. Poor attitude of males to seeking healthcare may be the cause of this difference.

Most of the hypertensive subjects were on multidrug therapy in various combinations, as reported by other researchers [10], however the proportion of patients on combination therapy (53%), falls short of the recommendation of several studies (at least 70% of cohort) necessary to achieve optimal blood pressure control [15-17]. Monotherapy was quite prominent in this study (47%). This contrasts with studies by Bakara., *et al.* [14] (2.5%), Oshibogun., *et al.* (17.8%). The fact that 43.6% of the Patients had mildly elevated blood pressure and also the exclusion of heart failure patients could explain this trend. Heart failure patients constituted 27.5% of the patients in the study by Bakara., *et al.*

The most prescribed monotherapy drug in our study was a calcium channel blocker while the least monotherapy drug was a thiazide diuretic.

Earlier studies in Nigeria show the dominance of thiazide diuretics as monotherapy [11,14]. Co morbidity of heart failure was prominent in these studies.

Our study finding is however consistent with the increasing use of ACEI, ARBs and CCBs in the past decade. The Antihypertensives and Lipid Lowering Treatment to Prevent Heart Attack Trial (ALL-HAT 2003) noticed this trend, never minding the revelation by The 7th Report of The Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC- 7) that newer antihypertensives were not superior to the diuretics. The cheap cost of diuretics is also not influencing this trend.

In a recent study in Nigeria, Olowofela., *et al.* [18] presented calcium channel blockers as the most prescribed antihypertensive. Xu., *et al.* [19] and Lin., *et al.* [20] also revealed this trend in their studies.

The most prescribed combination therapy in this study was a two-drug combination of Angiotensin receptor blocker and a calcium channel blocker, followed by a combination of Angiotensin I converting enzyme inhibitor and a calcium channel blocker.

Bakara., *et al.* [14], Sikidar., *et al.* [21] and Joseph., *et al.* [22] all showed the predominance of Angiotensin I converting enzyme inhibitor/Angiotensin receptor blocker and diuretic combination unlike our study. The exclusion of patient in heart failure could be the reason for this pattern in our study.

Also, the increasing tendency towards the use of calcium channel blockers as already showed by various studies adds to this trend.

Again, the dominance of the co-morbidity of diabetes mellitus in this study favored the use of calcium channel blockers and Angiotensin receptor blocker/Angiotensin I converting enzyme combination compared to Angiotensin receptor blocker/Angiotensin I converting enzyme inhibitor and diuretics combination. Multidrug combination of ≥ 3 was seen in patients with severe hypertension.

The use of centrally acting drugs like methyldopa in combinations was quite low. This was seen mostly in patients with chronic kidney diseases. The low prescription pattern is likely related to the tendency to avoid the side effects of the centrally acting alpha agonist.

Conclusion

The pattern of antihypertensive prescription at ABSUTH, Aba did not follow the recommendations of the seventh report of JNC on Prevention, Detection, Evaluation and Treatment of high blood pressure. It followed the individualized prescription pattern and recent increased trend of calcium channel blocker utilization in antihypertensive therapy. The prominence of diabetes mellitus as a comorbidity added to the glow of this trend.

Acknowledgement

We thank the staffs of the medical records department of ABSUTH for helping us with the retrieval of the patients' case notes.

Competing Interest

Authors declared they have no conflicts of interest.

Authors' Contributions

Onwuchekwa UN conceived and designed the manuscript, helped in acquisition of data, analysis and interpretation of data, wrote the manuscript and gave final approval of the version to be published.

Okoronkwo N C contributed in the design, writing and revision of the manuscript, and gave final approval of the version to be published.

Uzor E I helped with acquisition of data, writing and revision of the manuscript, and gave final approval of the version to be published.

Bibliography

1. Gazino TA. "Economic burden and the cost effectiveness of treatment of cardiovascular disease in Africa". *Heart* 20 (2008): 140-142.
2. Ogah OS., *et al.* "Blood Pressure, Prevalence of Hypertension and hypertension related complications in Nigerian Africans: A review". *World Journal of Cardiology* 4.12 (2012): 327-340.
3. Ike SO. "Prevalence of Hypertension and its complications among medical admission at the University of Nigeria Teaching Hospital Enugu (study2)". *Nigerian Journal of Medicine* 18.1 (2009): 68-72.
4. Arodiwe FB., *et al.* "Case fatality of Hypertension related admission in Enugu, Nigeria". *The Nigerian Journal of Clinical Practice* 12.2 (2009): 153-156.
5. Kearney PM., *et al.* "Global Burden of Hypertension: Analysis of worldwide Data". *Lancet* 365.9455 (2005): 217-223.

6. Ekwurife O., *et al.* "Prevalence Awareness, Treatment and Control of Hypertension in a Nigerian population". *Health* 2 (2010): 731-735.
7. Umegbolu EI. "Prescribing pattern in systemic hypertension and Pharmaco-economics of the commonly used antihypertensive in S.E Nigeria". *International Journal of Research in Medical Sciences* 6.1 (2018): 20-26.
8. Olanrewaju T O., *et al.* "Antihypertensive drug utilization and conformity to guidelines in a sub-sahara Africa, hypertensive population". *Journal of Clinical Pharmacology and Therapeutics* 48.1 (2010): 68-75.
9. Etuk K., *et al.* "Prescription pattern of antihypertensive drugs in a tertiary health institution in Nigeria". *Annals of African Medicine* 7 (2008): 128-132.
10. Oluseyi Adejimo., *et al.* "Prescription pattern of antihypertensive medication and BP control among hypertensive outpatients at Univ of Benin Teaching Hospital Benin city Nigeria". *Malawi Medical Journal* 29.2 (2017): 113-117.
11. Osibogun A and Okwor TJ. "Antihypertensive Prescription and cost pattern in an out-patient Department of a Teaching hospital in Lagos State Nigeria". *Open Journal of Preventive Medicine* 4 (2014): 158-163.
12. Jackson JH., *et al.* "Blood pressure control and pharmacotherapy patients in United States before and after the release of the JNC on the Prevention, Detection, Evaluation and Treatment of High Blood pressure (JNC) Guidelines". *Journal of the American Board of Family Medicine* 21 (2008): 512-521.
13. Chabanian AV., *et al.* "Joint National committee on prevention, Detection, Evaluation and Treatment of high blood pressure. The seven report of JNC". *Hypertension* 42 (2003): 1206-1252.
14. Bakara OQ., *et al.* " Antihypertensive use, prescription patterns and cost of medication in a teaching hospital in Lagos, Nigeria". *The Nigerian Journal of Clinical Practice* 19 (2016): 668-672.
15. The sixth report of the joint National committee on prevention, detection, evaluation and treatment of high blood pressure". *Archives of Internal Medicine* 157 (1997): 2413-2446.
16. Douglas JG., *et al.* "Management of high blood pressure in African-American consensus statement of the hypertension in African-American working group of the International Society of hypertension in Blacks". *Archives of Internal Medicine* 163 (2003): 1744-1745.
17. Chalmer J. "The ABCD of antihypertensive therapy". *Journal of Hypertension* 20 (2002): 615-616.
18. Olowofela A and Isah A. "Anti-hypertensive medicines prescriptions before and after the Nigeria hypertension society guidelines and prescriber's awareness of the guideline". *Nigerian Medical Journal* 58 (2017): 107-113.
19. Xu H., *et al.* "Trends and patterns of five antihypertensive drug classes between 2007-2012 in china using hospital prescription data". *The International Journal of Clinical Pharmacology and Therapeutics* 53 (2015): 430-437.
20. Lin PH and Wang JD. "Antihypertensive medication patterns and time trends for newly diagnosed uncomplicated hypertensive patients in Taiwan". *BMC Health Services Research* 28 (2008): 133.
21. Sikidar P., *et al.* "A study on prescribing pattern of hypertensives in adult patients attending a tertiary care hospital of Assam, India". *International Journal of Basic and Clinical Pharmacology (ISBCP)* (2016): 5.
22. Joseph S., *et al.* "A Study on prescribing pattern of antihypertensive medications in a tertiary care hospital in Malabar region". *Der Pharmacia Lettre* 6.4 (2014): 132-137.

Assets from publication with us

- Prompt Acknowledgement after receiving the article
- Thorough Double blinded peer review
- Rapid Publication
- Issue of Publication Certificate
- High visibility of your Published work

Website: <https://www.actascientific.com/>

Submit Article: <https://www.actascientific.com/submission.php>

Email us: editor@actascientific.com

Contact us: +91 9182824667