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Drug Utilization Pattern of Antihypertensives in a Private Healthcare Setting in Enugu, Nigeria

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Abstract

Hypertension is a public health challenge worldwide. Drug utilization study is a component of medical audit that monitors and evaluates prescribing practices and recommends necessary modifications. This study focused on the drug utilization pattern of antihypertensive drugs. The study was a retrospective study of facility records on drug use among hypertensive patients. It was conducted in a private health care setting facility in Enugu. A total of 1,005 prescriptions were evaluated for drug prescribing patterns. The blood pressure control was evaluated. A combination of two drugs was frequently prescribed (42.3%). Drug prescribing pattern showed that Angiotensin receptor blocker (Losartan) was mostly frequently prescribed (38.94%). Drug utilization of antihypertensive drugs was in agreement with JNC 7&8 recommendations. In the study combination of two or more anti-hypertensive drugs was frequently prescribed. The blood pressure control among the population was greater than 90%.

Keywords: *Antihypertensive, Drug utilization, Hypertension, Private healthcare setting.*

Introduction

Hypertension is a public health challenge. It affects approximately 1.13 billion people worldwide [1]. Across the World Health Organization (WHO) regions, the prevalence of hypertension was highest in Africa (46%) for both sexes. The lowest prevalence was in the WHO Region of the Americas at 35% for both sexes [2]. Untreated systemic hypertension, regardless of cause, results in inflammation and necrosis of the arterioles, narrowing of the blood vessels, and restriction of the blood flow to major body organs [3]. Hypertension was a primary or contributing cause of death for more than 494,873 people in the United States in 2018 [4]. In Africa, hypertension has resulted in nearly 900,000 deaths in 2016 [5]. In Southeast Nigeria Enugu, hypertension has caused 42.9% of deaths in 2019 [6].

Hypertension is managed with antihypertensive drugs. Classes of anti-hypertensive drugs include calcium channel blockers, Angiotensin converting enzyme inhibitors (ACEIs), Angiotensin II receptor blockers, β-adrenoceptor blockers, α - adrenoceptor blockers, centrally acting anti-adrenergic agent therapy, Direct-acting vasodilators, and Diuretics [7]. The recommendations of the JNC-7&8 suggest that most hypertensive patients will require two or more antihypertensive drugs [8].

Drug utilization evaluation studies is one of the important measuring tools for measuring prescribing practices in health facilities, distinguishing areas for improvement and

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developing drug prescribing practices, promoting rational prescribing practices, reducing morbidity and mortality, and decreasing the economic burden in their cost of illness [9, 10]. Drug utilization research also provides information on the efficiency, and the results can be used in setting priorities for the rational allocation of health care budgets.

The result of previous studies on drug utilization showed that most prescriptions were rational. Different classes of the drug were frequently prescribed in various studies, for example, Angiotensin-converting enzyme inhibitors [9], Calcium channel blockers [10-12], Diuretics [2, 13], and beta-blockers [14].

Virtual explosion in the marketing of new drugs, wide variations in the patterns and extent of drug prescribing, the growing concern about adverse reaction has resulted in drug utilization study. It can also be used to develop drug prescribing patterns and decrease the economic burden in the cost of patient illness. Previous studies done on drug utilization of antihypertensives were in tertiary hospitals [9, 10, 12, 13]. None has been reported for private healthcare settings in this part of Nigeria. With reference to a previous study done in a clinic in Malaysia, this study was adapted [15]. Hence, this study focused on the evaluation of anti-hypertensive drugs prescription patterns in private health care settings using, Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC- 7&8) guidelines.

Methods

The study was a retrospective study of facility records on drug use among hypertensive patients conducted in a private health care setting in Enugu, Enugu state, in the South-East Region of Nigeria. The private health care setting is run by a consultant cardiologist and a Senior Registrar, who consult for three (3) hours each on three (3) days of the week.

The total number of study samples was 1005 prescriptions. The subjects were randomly selected, employing systematic sampling. The data collected in a predesigned pro forma, included variables such as age, sex, drugs used, and whether prescriptions were in generic or trade name. The patients pay for their drugs. The blood pressure measurements at visits were also noted. The period was from January to December 2018. Consent was obtained from the doctor-in-charge of the healthcare setting before starting the study. There was no missed data for the folders were properly catalogued and easily assessable. Criteria for the study were as follows:

Inclusion Criteria

1. Patients diagnosed with hypertension were diagnosed using the standard WHO criteria of ≥ 140/90 at two (2) or more different measurements when initially seen or patients who had already been confirmed hypertensive from referral hospitals and doctors.
2. Patients of either gender above 18 years of age.

Exclusion Criteria

1. Patients who did not receive antihypertensive treatment.
2. Patients below 18 yrs. of age.

Statistics

Data analysis was carried out using Microsoft excel. Data were expressed as mean (STD DEV) for continuous variables and as a frequency for categorical variables. ANOVA analysis was done to define significant cases.

Results

Female patients (69.85%) were significantly more than the male patients ($p < 0.001$] (Table 1). Table 1 showed that most patients were between the age group of 50 and 69 years. Most of the prescriptions had trade names (75 %).

Table 1. Age and Gender Distribution of the patients

Age class (years)	Frequency	Mean age (years)	Percentage (%)
< 20	-	-	0.00
20-29	1	20.00	0.10
30-39	65	32. 20±2.75	6.46
40-49	127	44.38± 2.67	12.65
50-59	280	55.84 ±2.99	27.86
60-69	280	63.54 ±2.63	27.86
70-79	192	73.52±2.89	19.10
>80	60	92.07± 5.99	5.97
Gender			
Male	303	-	30.1 (p<0.001)
Female	705	-	69.9

Combination of two drugs (42.39%) was the most common prescription practice, as seen in Figure 1. There was a significant difference between the frequency of monotherapy and poly-therapy (p< 0.001). Out of the eight classes of antihypertensive drugs prescribed, Angiotensin II Receptor blockers (ARBs) was the highest prescribed, as shown in Table 2. Among the ARBs, Losartan was the most commonly prescribed.

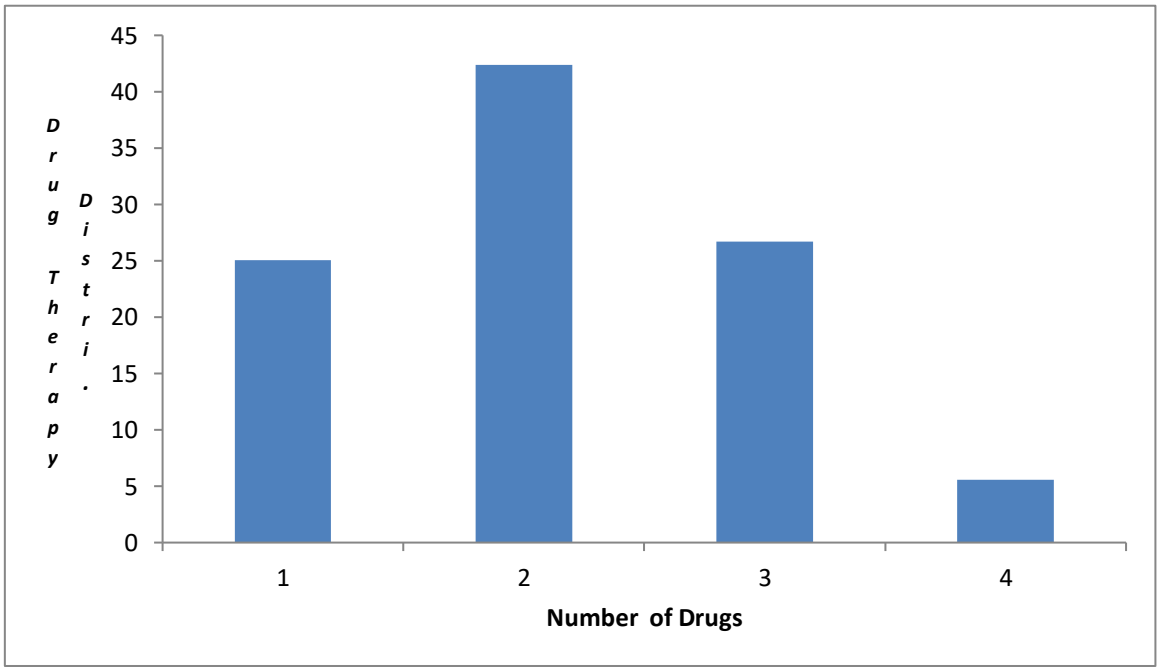

Figure 1. Drug Therapy Distribution

Key: *1= Monotherapy, 2= Dual-therapy, 3= Tri-therapy, 4= Quad-theory*

Table 2. Drug Prescription Pattern

Drug	**Frequency of prescription**	**Percentage (%)**
Diuretics	391	27.5
CCB	118	8.3
Centrally Acting	34	2.4
ACEI	64	4.5
β-blockers	276	19.4
ARB	507	35.7
Adrenergic Uptake Inhibitors	29	2.0
α-blockers	3	0.2
Total	1422	100
Key		
CCB= Calcium Channel Blockers		
ACEI = Angiotesin Converting Enzyme Inhibitors		
ARB= Angiotesin Receptor Blockers		

The blood pressure control of patients is shown in Table 3. Blood pressure goal was achieved in > 90% of patients' population. The goal of therapy for the treatment of hypertension, according to JNC 7& 8 guidelines, is the blood pressure of ≤ 140/90 for patients without diabetes and chronic kidney diseases. In the general population >18 years with diabetes and chronic kidney diseases, the pharmacological treatment goal is BP < 130/80.

Table 3. The Blood Pressure Control of Patients

Number of Anti-Hypertensive drugs	**Percent Number of patients (%)**	**Percentage BP Control (%)**
Mono therapy	25.07	100
Dual Therapy	42.39	100
Triple Therapy	26.77	99
Quadruple Therapy	5.57	100

Discussion

Hypertension is one of the highest non-communicable diseases worldwide. Hypertension is a risk factor for developing other cardiovascular diseases, including stroke, myocardial infarction, renal failure as well as various other vascular diseases. In this study, drug utilization of antihypertensive drugs in a private healthcare setting was carried out. Drug utilization study is the most effective method to assess the prescribing pattern of physicians [3].

The result of the present study showed that a combination of two anti-hypertensive drugs (42.39%) was the most frequently used. The combination of two-drug therapy had similar effects with three-drug combined therapy and monotherapy. The combination therapy of ≥ 2 drugs were frequently used (74.7%) and is in agreement with similar studies done in Nigeria 86.1%, 73%, and 64.4% [1, 16, 17]. However, in studies done in Nepal and Malaysia, monotherapy was commonly practiced [14, 15]. Combination therapy of ≥ 2 drugs in place of a high dose of monotherapy is recommended by JNC-7&8 guidelines to reach blood pressure goals. The combination therapy will reach the blood pressure goal with reduced side effects of the drugs combined.

Out of eight classes of anti-hypertensives prescribed, Angiotensin (II) receptor blockers (ARBs) was the most frequently prescribed drugs. The most frequently used ARB was Losartan. Losartan and Valsartan are specific Angiotensin-II receptor antagonists with many properties similar to those of the Angiotensin converting enzyme inhibitors (ACEI). They do not inhibit the breakdown of bradykinin and are less likely to cause dry cough [18, 19].

Blood Pressure control was achieved in more than 90 % of the patients. This was contrary to a previous study in the Western region of the country, where more than half of the patients remained suboptimal in blood pressure control [20]. The higher blood pressure control in patients will reduce the chance of complications such as stroke, myocardial infarction, heart failure, and renal failure.

Conclusion

Combination of two or more anti-hypertensive drugs was frequently prescribed. The prescription pattern is in adherence with JNC 7&8 guidelines for the management of hypertension. Blood pressure control was achieved in all the patients.

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Conflict of Interest

We have no conflict of interest with the publication of the manuscript or any affiliation with an organization or products that compete with those mentioned in the manuscript.

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