

Prescription Pattern of Drugs in Hypertensive Patients-A Retrospective Study

Umar Idris Ibrahim^{1*}, Danladi Suleiman², Aliyu Idris Mas'ud³, Adamu Ya'u⁴

¹Department of Clinical Pharmacy and Pharmacy Practice, Faculty of Pharmaceutical Sciences, Bayero University Kano, Nigeria

²Department of Pharmaceutical and Medicinal Chemistry, Faculty of Pharmaceutical Sciences, Bayero University Kano, Nigeria

³Department of Pharmacognosy and Herbal Medicine, Faculty of Pharmaceutical Sciences, Bayero University Kano, Nigeria

⁴Department of Pharmacology and Therapeutics, Faculty of Pharmaceutical Sciences, Bayero University Kano, Nigeria

Original Research Article

*Corresponding author

Umar Idris Ibrahim

Article History

Received: 05.04.2018

Accepted: 17.04.2018

Published: 30.04.2018

DOI:

10.21276/sajp.2018.7.4.2



Abstract: Recommended guidelines and innovations in drug formulations change over time. Thus the changes in prescription pattern of drugs used for treating hypertension. In addition, the classes of antihypertensive drugs used vary among countries. The objective of this study was to analyze the Prescription pattern of antihypertensive medications in a tertiary healthcare hospital in Kano, Nigeria. Retrospective analysis of prescription of hypertensive outpatients in Aminu Kano Teaching Hospital was conducted for a period of one year. Prescriptions for 285 hypertensive outpatients were analyzed on the basis of age, percentage of male and female patients, anti-hypertensive drug category, most frequently prescribed hypertensive drug and percentage of one/two drug combination. Angiotensin Converting Enzymes Inhibitors (ACEI) 27.7% (173) were the most commonly prescribed antihypertensive followed by calcium channel blockers 24.4% (152), Diuretics 23.9% (149), , Angiotensin receptor blockers 12.0% (75), Beta-blockers 6.4% (39), Central acting 5.6% (35) and Vasodilator 0.2% (1) ranked last in this study. ACE-Inhibitors are the most commonly prescribed monotherapy antihypertensive agents 38.25% (153) and their prescription pattern was in consistent with JNC8 guidelines.

Keywords: Prescription, antihypertensives, ACEIs, Pattern, Drug.

INTRODUCTION

Hypertension is a chronic, incurable condition that affects 18.4% of Nigerian population [1]. There is evidence that prevalence of non-communicable diseases is increasing, including hypertension which if not adequately managed, can result in a wide range of complications that have clinical, social and economic implications.

The use of antihypertensive drugs in the management of hypertension is for lifetime of the patients from the time of diagnosis. This translates into a substantial cost in drug therapy to the patients and government [2].

Despite the significant coverage availability of effective antihypertensive medications, the vast majority of hypertensive patients worldwide remain with uncontrolled BP [3]. Also, at least half of hypertensive patients who receive treatment fail to reach currently recommended BP targets in most countries [3]. Nevertheless, population-based surveys of hypertension management throughout the world consistently show variably inadequate control of blood pressure [4,5].

Rational drug utilization has a massive contribution to the global reduction in morbidity and mortality with its consequent medical, social and

economic benefits [6]. Inappropriate drug prescribing has been known all over the world as one of the major problems of health care delivery [7]. Periodic assessment of the prescribing practices in a health facility will help to identify specific drug use problems, sensitize practitioners on rational drug prescription and provide policy makers with relevant information that could be useful in the review of drug procurement policies and implementation of policies on drug prescribing practices in the affected institutions and regions. The objective of this study was to analyze the prescription pattern of antihypertensive drugs in a tertiary care hospital.

MATERIALS AND METHODS

Setting

This descriptive retrospective study was conducted at specialty outpatient unit of the Aminu Kano Teaching Hospital (AKTH). AKTH is a tertiary health facility serving approximately over ten million

people across the three states of Kano, Katsina and Jigawa in the North-Western region of Nigeria. This health facility is a tertiary center in which most specialties in medicine are found. Also, it serves as the Teaching Hospital for the College of Clinical Sciences of Bayero University, Kano.

ETHICAL CONSIDERATION

Before the commencement of the study, ethical approval for the study protocol was granted by the Ethical Committee of the Aminu Kano Teaching Hospital.

SAMPLE SIZE

The sample size was calculated based on the objective of this descriptive study for identifying medications prescription patterns. Approximately 200 - 400 patient folders were recommended as sufficient sample size to provide precise (confidence intervals/margin of error) within 5-15% of the estimated proportion with 95% confidence level [8]. The calculated sample size (n) for this study from the

estimated hypotensive population of 6,985 using 95% confidence level and 6% margin of error (confidence intervals) was 258 (https://www.surveysystem.com/sscalc.htm).

DATA COLLECTION

The data were abstracted from individual patient folders for one year from 1st January, 2017 to 31st December 2017. Data collection form was designed and used by the investigators to record data and information on the prescribed drugs in the facility. Two hundred of eighty five prescriptions containing at least one antihypertensive agent were selected using systematic random sampling. The brand names of the prescribed drugs in each prescription were decoded to generic names of drugs. Factors selected for present study includes age, gender, anti-hypertensive drug category, most frequently prescribed antihypertensive drug, percentage of one/more drug combination.

RESULTS

Table-1: Categorization of study population based on Gender

Gender	Frequency (n)	Percentage (%)
Male	64	22.5
Female	221	77.5

Out of the 285 prescriptions of antihypertensive drugs studied, 22.5% (64) were males, whereas females were 77.5% (221) See table 1.

The mean age was 50.9±17 years. Majority of patients were between 50-59 years age group (27.4%) See table 2.

Table-2: Categorization of hypertensive patients based on age

Age	Frequency (n)	Percentage (%)
≤ 20	3	1.1
20-39	27	9.5
30-39	50	17.5
40-49	71	24.9
50-59	78	27.4
60-69	41	14.4
Above 70	15	5.3

Table-3: Anti-hypertensive agents prescribed in the study population

Drug class	Frequency (n)	Percentage (%)
ACE inhibitors	173	27.7
Calcium channel blockers	152	24.4
Diuretics	149	23.9
Beta -blockers	39	6.4
Angiotensin receptor blockers	75	12.0
Vasodilators	1	0.2
Central acting	35	5.6

The frequency of the oral antihypertensive drug classes were as follows: ACE-inhibitors 27.7% (173), calcium channel blockers 24.4% (152), diuretics

23.9% (149), Beta-blockers 6.4% (39), Angiotensin receptor blockers 12.0% (75), Vasodilator 0.2% (1) and Central acting 5.6 (35). For details, see table 3

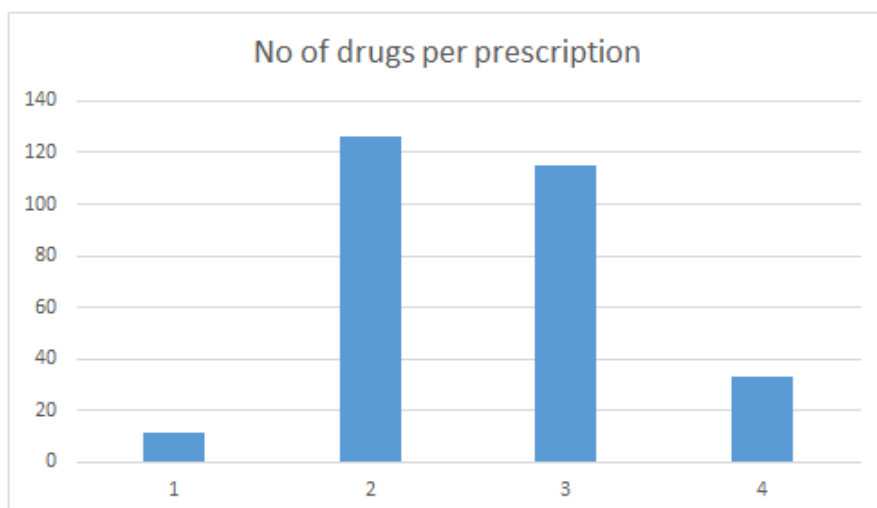


Fig-1

The number of drugs per prescription was between 1 and 3, with mean value of 2.6. While two drugs per prescription were the commonest (44.2%) 126, one drug per prescription was the least 11 (3.9%). See figure 1.

DISCUSSION

Treating a blood pressure above 140/90 mmHg has been shown to reduce cardiovascular risk. Physician may start treatment and nevertheless not reach target blood pressure values in their patients. Most patients will require more than one agent to achieve these target blood pressures. Medications for hypertension need to be taken for the entire life and factors like efficacy, side effects, drug interactions and cost of therapy need to be taken into consideration. Poor medication adherence may also lead to increased morbidity, mortality, and hospitalization admissions and escalated healthcare costs [9, 10]. It is therefore important that once the diagnosis of hypertension is established, blood pressure should be adequately controlled through regular follow-up, lifestyle modification, exercise and effective antihypertensive drugs [11]. This retrospective study was done for a period of 12 months to observe the drug-prescribing trends of anti-hypertensive agents in a tertiary care teaching hospital which indicated that the most commonly prescribed anti-hypertensive were ACEI's and CCB's and the prescribing pattern was rational as per the standard treatment guidelines (JNC VII) in this institution. A prescription-based survey is considered as an effective method to assess and evaluate the prescribing attitude of physicians and dispensing practice of pharmacists [12]. A continuous supervision is therefore required through such kinds of systematic audit that provide feedback from the physician and help to promote rational use of drugs. Our study findings are similar to those reported by other studies [13-15]. However in a study conducted by Adejumo *et al.* in southern part of Nigeria, the most common prescribe antihypertensive were thiazide

diuretics [16]. This rise could be due to the beneficial effects it has on the heart; reduced adverse effects with these drugs and recent findings suggesting that they are beneficial in diabetics.

The choice of antihypertensive drug should be determined by the drug's capacity to lower pressure and prevent complications. ACEIs have shown to be beneficial in patients with microvascular disease in kidney. This is due to their ability to decrease capillary perfusion, reducing trans-capillary leakage of albumin, and in long run decrease damage to both capillaries and arteries [17]. ACE inhibitors are also effective in decreasing cardiovascular mortality and morbidity in patients with congestive heart failure and post myocardial infarction [18, 19]. Reductions in cardiovascular end points were seen regardless of improvements in blood pressure, suggesting that ACE inhibitors have benefits that are independent of their antihypertensive effects [18-20]. This explains why ACEIs are the most frequently prescribed group and it is within JNC8 guideline.

DRUG CLASSES; MONOTHERAPY VERSUS POLY THERAPY

Majority of the studied patients were on polytherapy. This finding is similar to a study in Benin Nigeria that reported less than 20% of the study subjects were on monotherapy while the rest were on multiple drug therapy [16]. The findings on the prescription of antihypertensive medication are in consistent with guidelines as reflected by the significantly high use of ACEI with a low dose of diuretics in high risk groups for cardiovascular events. Use of multiple drugs in combinations is being increasingly recognized as critical to control hypertension in patients with diabetes. Several large clinical trials demonstrated that most patients with hypertension could achieve and sustain adequate blood pressure control only with the use of multiple

antihypertensive drugs [21]. In addition, it was intensified with increasing age, duration of diabetes, duration of hypertension or if complications/comorbidities were present. This was in consistency with treatment pattern of the evidence based guidelines. Dual blockade of the renin-angiotensin system using ARBs and ACEIs (the Candesartan and Lisinopril Microalbuminuria [CALM] study) found that the combination of both agents reduced blood pressure and urinary albumin [21].

CONCLUSION

This study has revealed that ACEIs were the most utilized anti-hypertensive drugs. The incidence of polypharmacy was high, generic and essential drug prescriptions were high which depicted that the drug use in the hospital was quite rational. Also, continuous medical education with focus on rational drug use and evidence based medicine should form part of the programme of the hospitals.

REFERENCES

1. Twagirumukiza M, De Bacquer D, Kips JG, de Backer G, Stichele RV, Van Bortel LM. Current and projected prevalence of arterial hypertension in sub-Saharan Africa by sex, age and habitat: an estimate from population studies. *J Hypertens* 2011; 29: 1243-1252
2. Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK, He J. Global burden of hypertension: analysis of worldwide data. *Lancet* 2005; 365: 217-223
3. Wolf-Maier K, Cooper RS, Kramer H, Banegas JR, Giampaoli S, Joffres MR, Poulter N, Primatesta P, Stegmayr B, Thamm M. Hypertension treatment and control in five European countries, Canada, and the United States. *Hypertension*. 2004;43(1):10-7.
4. Joffres M, Falaschetti E, Gillespie C, Robitaille C, Loustalot F, Poulter N, McAlister FA, Johansen H, Baclic O, Campbell N. Hypertension prevalence, awareness, treatment and control in national surveys from England, the USA and Canada, and correlation with stroke and ischaemic heart disease mortality: a cross-sectional study. *BMJ open*. 2013;3(8):e003423.
5. Volpe M, Tocci G, Trimarco B, Rosei EA, Borghi C, Ambrosioni E, Menotti A, Zanchetti A, Mancia G. Blood pressure control in Italy: results of recent surveys on hypertension. *J Hypertens*. 2007;25(7):1491-8.
6. Teferra A, Zeruesenay D, Asfawossen GY. Prescribing Pattern of Drugs in Medical Wards of Three Hospitals in North-West Ethiopia. *J Ethiopia Med Pract* 2002; 4: 8–13.
7. Erah PO, Olumide GO, Okhamafe AO. Prescribing Practices in Two Health Care Facilities in Warri, Southern Nigeria: A Comparative Study. *Trop J Pharm. Res.* 2003; 2(1): 175–182.
8. Johnston KM, Szabo SM, Donato B, Bolzani A. Methods of sample size calculation in retrospective burden of illness studies. *Value in Health*. 2016 May 1;19(3):A101.
9. Mar J, Rodriguez-Artalejo F. Which is more important for the efficiency of hypertension treatment: hypertension stage, type of drug or therapeutic compliance? *J. Hypertens*. 2001;(19):149–155.
10. Baroletti S, Dell'Orfano H. Medication adherence in cardiovascular disease. *Circulation*. 2010;121:1455–1458.
11. Gupta N, Sharma D, Garg SK, Bhargava VK. Auditing of prescriptions to study utilization of antimicrobials in tertiary hospital. *Indian J Pharmacol*. 1997;29: 411-5.
12. Goyal RK, Gandhi TP, Satia MC. Role of Hypertension Control In Diabetes- Mellitus And The Agents Of Choice. *Ind J Pharmacol*. 1993;25: 181 – 187.
13. Pittrow D, Kirch W, Bramlage P, Lehnert H, Hofler M, Unger T, Sharma AM, Wittchen HU. Patterns of antihypertensive drug utilization in primary care. *Eur J Clin Pharmacol*. 2004;60: 135–142.
14. Sandozi T, Emani VK. Survey of prescription pattern of anti-hypertensive drugs in hypertensives& hypertension associated diabetics. *Int.J Pharma Bio*. 2010;1(4): 23 -26.
15. Waleed M, Sweileh, Ansam F, Sawalha, Saed H, Zyoud, Samah W. Al-Jabi, Eman J. Tameem. Patterns of anti-hypertensive therapy in diabetic patients with and without reduced renal functions. *Saudi J Kidney Dis Transpl*. 2010;21(4): 652-659.
16. Adejumo O, Okaka E, Iyawe I. Prescription pattern of antihypertensive medications and blood pressure control among hypertensive outpatients at the University of Benin Teaching Hospital in Benin City, Nigeria. *Malawi Med J*. 2017;29(2):113-7.
17. Hackam DG, Khan NA, Hemmelgarn BR, Rabkin SW, Touyz RM, Campbell NR, Padwal R, Campbell TS, Lindsay MP, Hill MD, Quinn RR. The 2010 Canadian Hypertension Education Program recommendations for the management of hypertension: part 2—therapy. *Can J Cardiol*. 2010;26(5):249-58.
18. Pfeffer MA, McMurray JJ, Velazquez EJ, Rouleau JL, Køber L, Maggioni AP, Solomon SD, Swedberg K, Van de Werf F, White H, Leimberger JD. Valsartan, captopril, or both in myocardial infarction complicated by heart failure, left ventricular dysfunction, or both. *New England Journal of Medicine*. 2003;349(20):1893-906.
19. Williams B, Poulter NR, Brown MJ, Davis M, McInnes GT, Potter JF, Sever PS, Thom SM. British Hypertension Society guidelines for hypertension management 2004 (BHS-IV): summary. *Bmj*. 2004;328(7440):634-40.
20. Dickstein K, Kjekshus J, OPTIMAAL Steering Committee, OPTIMAAL Study Group. Effects of

losartan and captopril on mortality and morbidity in high-risk patients after acute myocardial infarction: the OPTIMAAL randomised trial. *The Lancet*. 2002;360(9335):752-60.

21. Mogensen CE, Neldam S, Tikkanen I, Oren S, Viskoper R, Watts RW, Cooper ME. Randomised controlled trial of dual blockade of renin-angiotensin system in patients with hypertension, microalbuminuria, and non-insulin dependent diabetes: the candesartan and lisinopril microalbuminuria (CALM) study. *Bmj*. 2000;321(7274):1440-4.