Pak. J. Pharm. 25 (1 & 2)
37-41, 2012

ISSN: 1019-956X

PRESCRIPTION PATTERNS OF ANTIHYPERTENSIVES AND DRUG UTILISATION IN A GENERAL HOSPITAL IN MINNA, NIGER STATE, NIGERIA

Eraga Sylvester Okhuelegbe[1*], Odili Valentine Uche[2], Iwuagwu Magnus Amara[1] and Igodo Johnson Orite[1]

[1]Department of Pharmaceutics and Pharmaceutical Technology,
Faculty of Pharmacy, University of Benin, Benin City, 300001.
[2]Department of Clinical Pharmacy and Pharmacy Practice, Faculty of Pharmacy,
University of Benin, Benin City, 300001.

ABSTRACT

The prescribing pattern and drug use in the management of essential hypertension in a general hospital and its conformity to the JNC VII and WHO/ISH management guidelines was investigated. 1673 prescriptions from a total of 205 case files of hypertensive patients (> 18 years) attending the medical out-patients department of a general hospital between January and December 2009, were retrospectively surveyed. Results showed that the most prescribed antihypertensive drug class was the Fixed Dose Combinations (FDC) (26.83%) followed by Calcium Channel Blockers (20.83%), ACE Inhibitors, (11.15%) and Diuretics (7.88%). Individually, the fixed dose combination diuretic; Hydrochlorothiazide + amiloride (Moduretic) (26.04%) was the most prescribed drug followed by Nifedipine (11.81%), Lisinopril (11.15%), Amlodipine (8.65%), and Bendroflumethiazide (5.02%). Combination therapy (73.38%) was used more commonly than monotherapy (22.50%). Among the combination therapies, 2-drug therapy (28.97%) was more preferred than the 3-drug (19.90%).Fixed Drug Combination (FDC) (35.62%) and Diuretic + 2 drugs (11.59%) were the most prescribed combinations. The study also shows that of the 1673 numbers of encounters, there were a total of 5973 drugs and 102 non-drug interventions. The average number of drug per encounter was 3.6. 31.2% of the drugs were prescribed by generic name and 82.5% were from the Essential Drug List (EDL). The percentage of encounter with antibiotics and injections were 7.36% and 0.7% respectively. The pattern of antihypertensive utilization complied partially to the JNC 7 guideline and WHO/ISH 1999 guidelines but did not conform to the Essential Drug List Act of Nigeria.

Keywords: Antihypertensives, Prescription pattern, Drug utilization, Treatment guideline

INTRODUCTION

Knowledge of existing prescribing pattern and drug use in the management of hypertension can provide useful information for improving clinical practice in this field. Prescription patterns vary by age, gender and clinical facilities, with monotherapies being found to be dominant in the first year of treatment, albeit declining over time (Pang-Hsiang and Jung-Der, 2008).

Essential hypertension remains a major modifiable risk factor for cardiovascular disease (CVD) despite important advances in our understanding of its pathophysiology and the availability of effective treatment strategies. Essential hypertension comprises the condition in which no specific cause was identified. It is the most common non-communicable disease treated by Nigerian physicians (Akinkugbe, 1992).

Hypertension is one of the most common worldwide diseases afflicting humans. Because of the associated morbidity and mortality and the cost to society,

***Corresponding author's Address:** Eraga Sylvester Okhuelegbe, Department of Pharmaceutics and Pharmaceutical Technology, Faculty of Pharmacy, University of Benin, Benin City, 300001

hypertension is an important public health challenge. Hypertension is a disease of complex etiology, affecting 972 million people world-wide (Kearney *et al*., 2005). It is estimated that the world wide prevalence of hypertension would increase from 26.4% in 2000 to 29.2% in 2025. Hypertension is an important risk factor for cardio vascular disease and has become a major global burden on public health (Lawes *et al*., 2006). Therefore, blood pressure control needs to be considered in conjunction with the control of other concomitant cardiovascular risk factors. The prevalence of hypertension is high and prescriptions containing antihypertensive drugs are increasing daily. Hypertension is also associated with other diseases such as diabetes, hypercholesterolemia and cardiovascular disease (Shapna *et al*., 2010).

The seventh report of Joint National Committee (JNC 7) guidelines set a treatment goal of < 140/90 mmHg for the prevention and management of uncomplicated hypertension to decrease morbidity and mortality by the least intrusive means possible(JNC Express, 2004).To attain the treatment goal for hypertensive patients therefore requires rational drug prescribing, an aspect of rational drug utilization. Inappropriate prescribing reduces the quality of medical care and leads to a wastage of resources (Laing *et al*. 2001).

The aim of this study was to describe the prescribing pattern of physicians in Medical Out-Patient Department (MOPD) in General Hospital, Minna, Niger State, Nigeria with respect to antihypertensive prescribing and to identify whether such pattern of prescription is appropriate and in accordance with JNC 7 and other international guidelines.

METHODS

A one year retrospective study was conducted to evaluate the prescribing patterns of antihypertensive in the management of essential hypertension in Medical Outpatient Department (MOPD) of General Hospital, Minna, Niger State, Nigeria. The patients were referred from the General Outpatient Department (GOPD) to the MOPD.

The Hypertension Clinic of the MOPD operates every Tuesday of the week. The clinic has three medical consultants, three principal medical officers and nurses. The prescriptions generated from this unit were serviced by the outpatient pharmacy department manned by competent pharmacists and pharmacy technicians.

Ethical Consideration

Ethical approval for the study protocol was granted by the State Health Management Board (SHMB) and the Hospital Ethical Committee.

Data Collection

A modified WHO prescribing indicator form and other data collection forms were used to collect data from the register and case file of patients who were treated for essential hypertension in the MOPD from January 2009 to December 2009. These patients visited the clinics weekly, fortnightly or monthly. Exclusion parameters were patients with secondary hypertension, inpatients and patients below 18 years of age.

RESULTS

Data from 205 case files of patients were assessed during the study period. The demographic characteristics of the 205 patients shows 18 (8.7 %) patients falling within the age group of 18 - 30 years, 112 (54.7 %) patients within 31 - 50 years and 74 (36.6) patients within 51 - 95 years. Of the 205 patients, 38 (18.5 %) were males with a mean age of 48.5 years and 167 (81.5 %) were females with mean age of 52.5 years. The male to female ratio was 1:4.4. The mean age for the 205 patients was 47.7±11.8 years, range 18-80 years. The prevalence of hypertension among the age group was higher for the age range of 41 - 50years with a total of 83 (40.5 %) patients and followed by the 51 - 60 years age range with 45 (22 %) patients. The prevalence of hypertension in other age groups is as shown in Figure 1.

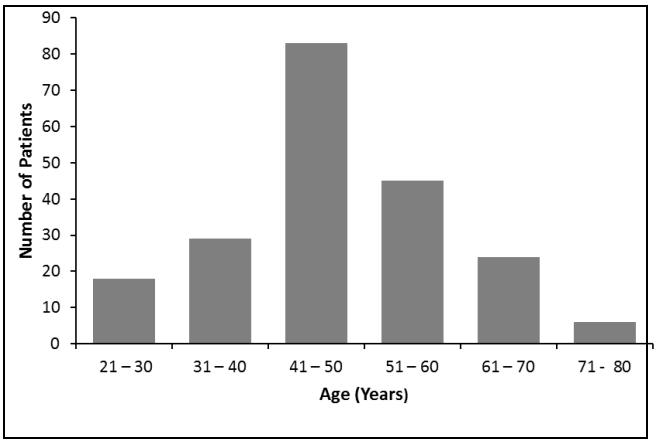

Figure 1: Age distribution of hypertensive patients

The 205 patients included in this research work visited the hospital 1,673 times within the 12 months period studied. These visits resulted in 1,673 prescriptions of which there were 5,973 (98.42 %) drug interventions and 102 (1.68 %) non-drug interventions. From the total drug and non-drug prescriptions, 4,707 (77.42 %) interventions were for the treatment of hypertension while 1,368 (22.58 %) were for the treatment of other ailments presented by the hypertensive patients (comorbidity). The distribution of the antihypertensive

drugs prescribed into their therapeutic groups is shown in Table I and Figure 2. Fixed dose combinations (FDC) 26.83 % were the most prescribed followed by calcium channel blockers (CCB) 20.46 % and angiotensin converting enzyme inhibitors (ACEI) 11.15 % and diuretics 7.88 %. The fixed dose combination diuretic; hydrochlorothiazide + amiloride (26.04 %) was the most prescribed drug followed by Nifedipine (11.81 %) and Lisinopril (11.15 %). The three drugs fixed dose combination; Reserpine + Dihydroergocristine + Clopamide (0.79 %) was the least prescribed. Low dose aspirin (75 mg) (3.73 %) were found to be moderately prescribed at the hospital.

Table I: Frequency of prescription based on individual drugs

Drug Class (%)	Drug	Prescriptions	
		n	%
Diuretics(7.88 %)	Bendroflumethiazide	304	5.02
	Spironolactone	96	1.58
	Furosemide	78	1.28
Calcium Channel Blockers (20.46 %)	Nifedipine	716	11.81
	Amlodipine	524	8.65
ACE Inhibitors (11.15 %)	Lisinopril	676	11.15
Beta Blockers (3.96 %)	Atenolol	240	3.96
Centrally Acting Agent (1.96 %)	Methyldopa	119	1.96
Antiplatelet (3.73 %)	Aspirin (low dose)	226	3.73
Fixed Dose Combination (26.83 %)	Hydrochlorothiazide + amiloride	1578	26.04
	Reserpine + Dihydroergocristine + Clopamide	48	0.79
Non-Drug (1.68 %)	Lifestyle Modification	102	1.68
Others (22.58 %)	Antimalarials	550	9.08
	Antibiotics	446	7.36
	Analgesics	225	3.71
	Antihistamines	68	1.12
	Vitamins	55	0.91
	Others	24	0.40

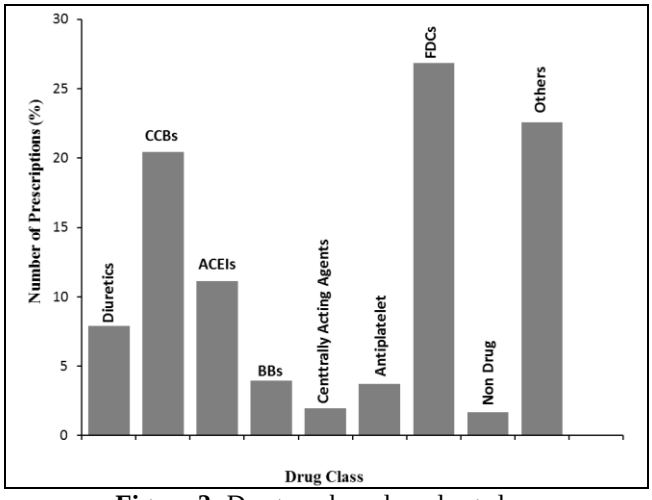

Figure 2: Drug use based on drug class

Table II and III show the distribution of monotherapy and combination therapies. The result shows 20.44 % of the prescriptions contained a single drug while 73.46 % contained two or more drugs. Two drug combinations (52.78%) were the most prescribed with Fixed Drug Combination (FDC) accounting for 35.62 % of total prescriptions. This was followed by a 3 drug combination (19.90 %).

Table II: Number of antihypertensive drugs prescribed

Drug Therapy Prescribed	Prescription	
	n	%
Single drug therapy	342	20.44
Multi-drug Therapy		
2 drug therapy	883	52.78
3 drug therapy	333	19.90
4 drug therapy	13	0.78
Total	1229	73.46
Non-drug therapy	102	6.10

Fixed Drug Combination (FDC) (35.62 %) and Diuretic + 2 drugs (11.59 %) were the most prescribed combinations. Life style modification accounted for 6.10 % of total prescription or encounters. The WHO core drug prescribing indicators measured in the hospital gave the following results. The average number of drug per encounter in the hospital was 3.6. The percentage of

drugs prescribed by generic name was 68.7 % and 82.5 % was from Essential Drug List (EDL). The percentage of antibiotics and injections prescribed per encounter were 7.36 % and 0.7 % respectively.

Table III: Frequency of combination therapies

Drug Combinations	Prescriptions Encountered	
	n	%
FDC	596	35.62
Diuretic + 1 Drug	131	7.84
CCB + ACEI	94	5.66
CCB + Centrally Acting Agents	25	1.49
ACEI + Centrally Acting Agents	20	1.19
BB + ACEI	17	0.98
Diuretic + 2 Drugs	194	11.59
FDC + 1 Drug	91	5..44
FDC (3 Drugs)	48	2.87
FDC + 2 Drugs	10	0.60
Diuretic + 3 Drugs	3	0.17

DISCUSSION

In this study hypertension was more prevalent in females. This is in line with similar studies works done in Bangladesh, Hong Kong, India and Germany (Lee *et al*., 1997; Pittrow *et al*., 2004; Shapna *et al*., 2010; Bajaj *et al*., 2012). Based on the drug most prescribed in the hospital, it was observed that the clinicians seem to follow the WHO/ISH and JNC 7 guidelines considering the high use of diuretics either alone or in combinations as FDCs. The guidelines state that thiazide diuretic should be the most prescribed drug in the management of essential hypertension (WHO/ISH 1999; JNC Express, 2004). Also the frequent prescribing of nifedipine and amlodipine is consistent with previous findings that calcium channel blockers are more effective in blacks than in other races (Anyika and Babatunde, 2001; Lindhorst *et al*. 2007). The low use of beta blockers is in line with earlier reports that the low use of α and β blockers remains unimpressive, despite well documented safety and efficacy margin of these agents in blacks (Aguwa and Rose, 1971).

The use of low dose aspirin could be considered irrational because aspirin is only indicated after a normal blood pressure has been attained in order to avoid hemorrhagic strokes (Khan, 2008). Also, the regimen of the centrally acting agent; methyldopa and the 3 drugs FDC (Reserpine + Dihydroergocristine + Clopamide) which are of doubtful efficacy and/or many side effects were below daily dosage indicating irrational drug prescribing.

Furthermore, the high percentage of prescriptions containing combination therapy indicates polypharmacy, which does not conform to the JNC 7 and WHO/ISH guidelines. The guidelines suggest that a diuretic alone should be the first line drug for a stage I hypertension. If a high risk condition exists, a second drug can be added from another group of drugs and for a stage II hypertension, a diuretic plus CCB or ACEI, or ARB or BB should be prescribed (WHO/ISH 1999; JNC Express, 2004).

The WHO core drug prescribing indicators of an average of 3.6 drugs per encounter or prescription was higher than the values of 1.6-1.8 recommended by WHO guidelines on rational use of drug in the region (Isah, 2002). This value is slightly lower than that from a similar study done in a tertiary institution in Nigeria (Anyika and Babatunde, 2001), but higher than those from two health facilities in Dar-Es-Salaam (Rimoy, 2007) and health centres in Indonesia (WHO/DAP, 1993), which gave values of 3.9, 2.9, 3.3 and 3.3 respectively. This value was not too high bearing in mind that the WHO and JNC 7 guidelines recommended combination therapy for stages I and II hypertension and some hypertensive patients come to the hospital with other ailments (co-morbidity) like malaria, infection diseases, anaemia, fever etc.

Generic name prescribing of antihypertensive drugs prevailed with 68.70% of the prescriptions. This percentage of drug prescriptions by generics was high when compared with similar studies done in two tertiary health institutions in Nigeria which gave 31.6% and45.3 % (Anyika and Babatunde, 2001; Oreagba *et al*., 2004). Also, the percentage of drugs (85.2 %) prescribed from the Essential Drug List was lower than that of University of Lagos Teaching Hospital which was a 100% (Oreagba *et al*., 2004). These levels of compliance are low compared to the recommendation of National Drug Formulary and Essential Drug List Act (Federal Republic of Nigeria, 2003).

The prescriptions containing antibiotics (7.35 %) was high based on the fact that some patients who visit the hospital will likely have one form of infectious disease or another. The percentage of injections is low because only a few drugs for the management of hypertension are injectable.

CONCLUSION

The study has contributed to the knowledge pool of essential hypertension management in this region of Nigeria. The result shows some degree of over-prescribing hence prescribing pattern at the General Hospital complies partially with the JNC 7 and WHO/ISH 1999 guidelines but falls below the recommendation of the Essential Drug List Act of

Nigeria which states that all drugs should be prescribed in generic and from the Essential Drugs List.

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