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*Research article*

## **Pattern of Prescriptions among Elderly Diabetic- Hypertensive Patients in a Nigerian Teaching Hospital**

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**ABSTRACT:** A retrospective study was carried out from 2002 -2005 to describe the prescribing pattern among elderly diabetic-hypertensive patients in relation to their age and sex and to examine the existence of prescribed drugs considered potentially inappropriate for these elderly patients. Information such as age, sex religion and drugs prescribed were obtained using prescriptions contained in the patients case notes. Fifty (87.7%) of the case notes contained relevant information. Majority were females 33(66%) and mean age $\pm$ SD was 66.28 $\pm$ 8.107. A total of 1137 prescriptions were encountered with an average of 4.95 number of drugs. The study established no significant association between the gender and age( $P=0.8194$ ), average number of repeat prescriptions( $P=0.2656$ ) and average number of drugs per prescription( $P=0.5739$ ) respectively. The most common therapeutic groups encountered in the case notes were anti-diabetics (100%), anti-hypertensives (100%) and Analgesics (96%). The most common potentially inappropriate medication encountered was amitriptyline 26(52%) followed by Nifedipine 23(46%). The study indicates the presence of polypharmacy in prescribing patterns irrespective of age and sex and use of potentially inappropriate medications among this vulnerable group. However there was compliance to recommended treatment guidelines for diabetic hypertensive patients.

**Keywords:** Elderly, Diabetic-hypertensive, Prescription pattern, inappropriate medications

### **INTRODUCTION**

Hypertension and diabetes mellitus are interrelated diseases. Alone each condition is a risk factor for cardiovascular disease and together, they strongly predispose to end stage renal disease, coronary artery disease and peripheral vascular and cerebrovascular disease.( Bakris *et al* 2000). and they exact a particularly heavy health and economic burden on older adults due to associated long term illness, diminished quality of life and greatly health care cost. (Fincham *et al* 1985).

The prevalence of coexisting hypertension and diabetes appears to be increasing in industrialized nations because populations are aging and both hypertension and Non-insulin dependent diabetes mellitus (NIDDM) incidence increases with age. (Sowers *et al* 1995). Also complications arising from both conditions are fast becoming the commonest causes of morbidity, hospitalization and mortality in African populations (Wokoma 2002).

The need for early recognition and aggressive treatment of hypertension in diabetic persons cannot be overemphasized. Indeed, the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure(JNCVII) specifically recommends prompt pharmacologic therapy, as well as appropriate adjunctive lifestyle modifications, for the diabetic patient who has even Prehypertension(120-139/80-89mmHg).( National Institutes of Health, National Heart, Lung and Blood Institute2003).Most patients with diabetes will require two or more antihypertensive therapies from different classes with complementary mechanisms of action to control their blood pressure (Bakris 2004). Thiazide diuretics,  $\beta$  blockers, or

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calcium channel blockers(CCBs) can be added to Angiotensin Converting Enzyme inhibitor (ACEI) or angiotensinII receptor blocker(ARB) treatment to achieve target blood pressure, either as an individual drug component or as part of a fixed dose combination product.(American Diabetes Association. 2005; Chobanian *et al* 2003;, Kidney disease Outcomes Quality Initiative(K/DOQI) 2004)

The number of drugs per patient is the main factor associated with adverse reactions ,interactions, drug mistakes and non-completion, (Walnut *et al* 2006) of their medications as well as other drug related problems. The prevention and recognition of drug related problems in elderly patients and other vulnerable population is one of the principal health care quality and safety issues for this decade.( Fick *et al* 2003)

The Use of consensus criteria for safe medication use in elderly patients is one approach to developing reliable and explicit criteria when precise clinical information is lacking. The Beers criteria is one of the consensus criteria that has been used to survey clinical medication use, analyze computerized administration data sets and evaluate intervention studies to decrease medication problems in older adults. (Fick *et al* 2003) This study aimed to describe drug prescribing patterns among elderly diabetic -hypertensive patients in relation to their age and sex. It also examined the existence of prescribed drugs considered potentially inappropriate for elderly patients using the 2002 Beers list.

## MATERIALS AND METHODS

**Design:** A convenient descriptive retrospective study was carried out in the medical Out Patient department of Olabisi Onabanjo University Teaching Hospital (O.O.U.T.H) which is a 203 bedded Hospital located in Sagamu Local Government Area of Ogun State.

**Instruments and subjects:** Prescriptions contained in 56 case notes of elderly patients diagnosed of diabetes and hypertension were consecutively selected and evaluated. Age of the elderly patient was taken as  $\geq 50$  years as stated in the WHO definition of an older or elderly person. (WHO 2009)

**Method of data collection:** A self-designed data collection form was used for collection of data from the prescriptions encountered in these case notes. Information collected included Age, Sex, number of prescription on each hospital visit and prescribed drugs given throughout 2002 to 2005.

**Data analysis:** Data was entered into Microsoft Excel for easy sorting and further analysis was done with the aid of SPSS version 12 and Graph pad InStat (.Unpaired t test). The 2002 Beers list (Criteria for potentially inappropriate medication use in older adults independent of diagnoses or conditions was used to determine drugs encountered that were inappropriate for the elderly.

## Inclusion/exclusion criteria

Permission was sought and obtained before commencement of study. Only the case notes of elderly diabetic hypertensive patients with one or more anti-diabetic and antihypertensive drugs respectively were made use of and the study was strictly from the year 2002 to 2005.

## RESULTS

Out of 57 case notes consecutively selected, 50 (87.7%) contained the information required. Majority of them were female 33(66%), 17( 34%) were males and mean age  $\pm$  SD was  $66.28 \pm 8.107$ . Thirty two (64%); 17(34%); and 1(2%) were Christians, Muslims and of African traditional religion respectively.

A total of 1137 prescriptions were encountered giving a total of 5623 number of drugs. An average of 20 prescriptions per case note was encountered. Average number of drugs was 4.95

The frequency distribution of prescriptions on the number of drugs encountered is shown on Figure 1 while the age, gender and prescription pattern of the patients is shown of Table 1. There was no significant association between the gender and age( $P= 0.8194, t=0-299, df=48$ ), average number of repeat prescriptions ( $P=0.2656, t=1.126, df=48$ ) and average number of drugs per prescription ( $P=0.5739, t=0.5662, df=48$ ) respectively using unpaired t test.

**Table 1**

Age, Gender and Prescription Pattern (No of Prescription, number of drugs) of the encounters.

| Item                        | Male              | Female             |
|-----------------------------|-------------------|--------------------|
| Number                      | 17                | 33                 |
| *Age(years)                 | $66.65 \pm 8.79$  | $66.09 \pm 7.864$  |
| *No of repeat Prescriptions | $19.88 \pm 11.47$ | $24.27 \pm 13.782$ |
| *No of drugs/prescription   | $4.72 \pm 0.818$  | $4.87 \pm 0.9201$  |

\*Mean $\pm$ SD

## Occurrence of the therapeutic Groups-

The occurrence of the different therapeutic groups per case note is shown in Table 2. The most common therapeutic group occurring among these patients were

antidiabetics, anti-hypertensives, analgesics and central nervous system drugs.

### Use of Antidiabetics and Antihypertensive drugs

Various types of antidiabetics and antihypertensive drugs (monotherapy/combination) were encountered in this study. The pattern of antidiabetics and types of antihypertensive drugs used are shown on Table 3 and 4 respectively. Occurrence of monotherapy for the 2 groups of drugs is shown on Figures 2 and 3.

**Table 2:**

Pattern of therapeutic drugs encountered in the Case notes.

| Therapeutic Group                                | n  | %    |
|--|----|------|
| Antidiabetics (e.g Glibenclamide)                | 50 | 100  |
| Anti hypertensive (e.g Lisinopril)               | 50 | 100  |
| Analgesics (e.g aspirin)                         | 48 | 96   |
| Central nervous system drugs (e.g amitriptyline) | 37 | 74   |
| Multivitamin (e.g Vitamin B.co)                  | 30 | 60   |
| Antimalarials (e.g Suphadoxin/pyrimethamine)     | 20 | 40   |
| Antibiotics (e.g Ampiclox)                       | 19 | 38   |
| Anti allergics (Chlopheniramine)                 | 14 | 28   |
| Cardiovascular system drugs (e.g Digoxin)        | 5  | 10   |
| Anthelmintics (e.g albendazole)                  | 4  | 8.0  |
| Antifungals (e.g ketoconazole)                   | 4  | 8.0  |
| Antiulcers (e.g mistmag)                         | 3  | 6.0  |
| <i>Others</i>                                    | 10 | 20.0 |

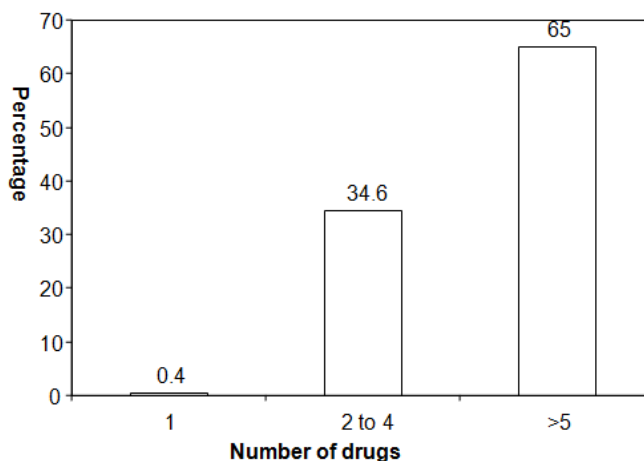
**Table 3**

Pattern of antidiabetics encountered in the case-notes

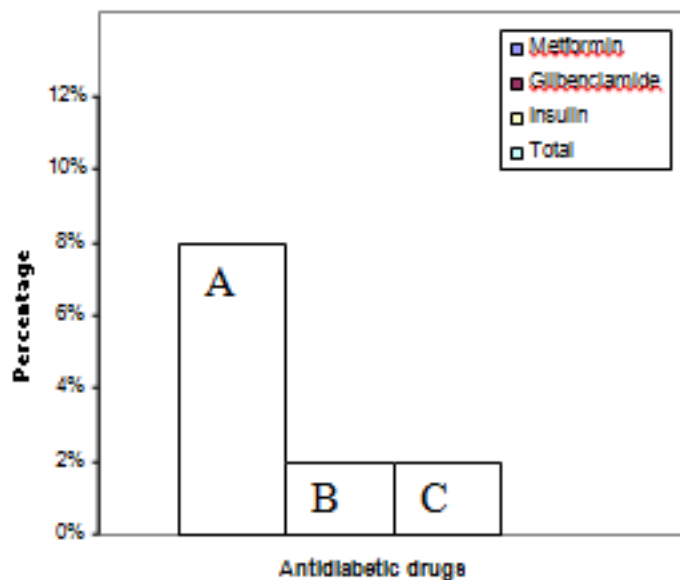
| Drug therapy                                     | n  | %  |
|--|----|----|
| Glibenclamide only                               | 1  | 2  |
| Metformin only                                   | 4  | 8  |
| Insulin only                                     | 1  | 1  |
| Glibenclamide+ Metformin                         | 38 | 76 |
| Glibenclamide+ Metformin+ Insulin                | 3  | 6  |
| Glibenclamide Metformin+ Chlopropamide           | 1  | 2  |
| Glibenclamide+ Metformin+ Insulin+ Chlopropamide | 1  | 2  |
| Metformin+ Insulin                               | 1  | 2  |

### Occurrence of potentially inappropriate medications

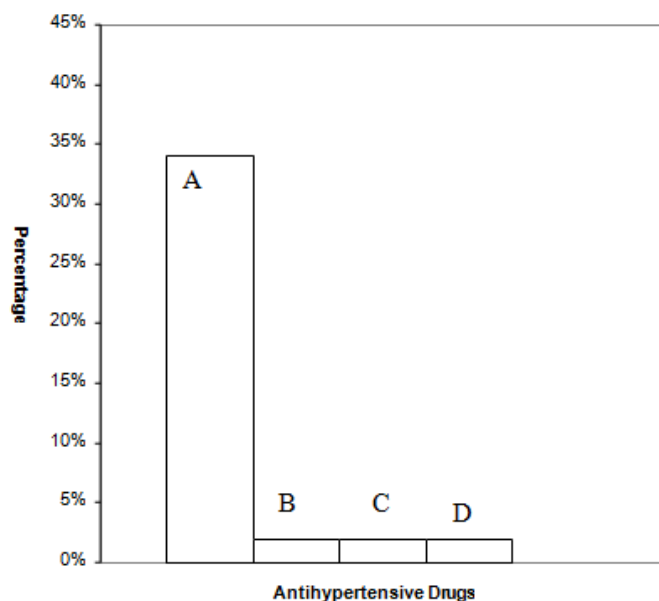
Medications found potentially inappropriate for the elderly according to the Beers list are shown in Table 5. Amitriptyline was the most common potentially inappropriate medication.



**Figure 1-**  
Percentage distribution of number of medicines per prescription



**Figure 2**  
Occurrence of antidiabetics as monotherapy



**Figure 3**  
Occurrence of antihypertensives as Monotherapy

**Table 4**  
Types of antihypertensive drug encountered

| Antihypertensive Drugs                    | n  | %  |
|---|----|----|
| Amlodipine                                | 7  | 14 |
| Atenolol                                  | 4  | 8  |
| Captopril                                 | 4  | 8  |
| Hydrallazine                              | 1  | 2  |
| Lisinopril                                | 46 | 92 |
| Methyldopa                                | 10 | 20 |
| Moduretic (Amiloride+Hydrochlorothiazide) | 9  | 18 |
| Nifedipine                                | 24 | 48 |
| Prazosin                                  | 1  | 2  |
| Tenoretic (Atenolol+Chlorothiazide)       | 3  | 6  |
| Lasix                                     | 1  | 2  |
| Felodipine                                | 1  | 2  |
| Hydrochlorothiazide                       | 2  | 4  |
| Propranolol                               | 2  | 4  |
| Minizide (Prazosin+Polythiazide)          | 1  | 2  |

n=50

**Table 5**  
Potentially inappropriate Medications encountered in the case-notes

| Drug                   | n  | %  | Severity |
|------------------------|----|----|----------|
| Amitriptylin           | 26 | 52 | High     |
| Diazepam               | 8  | 16 | High     |
| Digoxin                | 1  | 2  | Low      |
| Methyldopa             | 10 | 20 | High     |
| Chlopropamide          | 2  | 4  | High     |
| Chlopheniramine        | 13 | 13 | High     |
| Naproxen               | 2  | 4  | High     |
| Shortacting Nifedipine | 23 | 46 | High     |

## DISCUSSION

Hypertension and diabetes should be adequately treated so as to avoid cardiovascular morbidity and mortality. In this study, majority of the respondents fell between the age range 51- 69 years, were females, and were Christians respectively. Majority had an average of approximately five drugs per prescription. This is polypharmacy and may lead to improper use of the prescribed medicines. Similar results were obtained in a previous study (Alebiosu 2004). According to Good, (Good 2002), use of multiple medications increases in a variety of ways likelihood of an unintended therapeutic outcome. This is true for the elderly patients who are susceptible to adverse drug effects because of greater underlying physical disability which can lead to poor adherence. Though elderly hypertensive diabetic patients are more likely to take multiple medications prescriptions and non prescription products as seen in this study, yet the medication regimen should be simplified whenever appropriate.

There was no significant difference in the pattern of prescription between the male and the females. Majority of the patients were treated with biguanides (metformin) followed closely by the sulfonylureas (Glibenclamide). More than half of the patients had a combination of Glibenclamide and Metformin.

The use of insulin in this study was quite low as Insulin was prescribed alone in one case note and in combination with other drugs in 2 other case notes. This may be because the patients are of type 2 diabetes. However the importance of the use of insulin in pancreatic beta cell failure must be emphasized. Also the addition of an oral agent mainly a sulfonylurea to therapy of patients with insulin control improves glycaemic control (Sorlie et al 1995).

The most common antihypertensive used was lisinopril (Angiotensin Converting Enzyme Inhibitor). The preservation of renal function in patients with type 2 diabetes mellitus has also been demonstrated with ACE inhibitors in several clinical studies (Ruggenti *et al* 2001, HOPE 2000, Mann *et al* 2003). The most common combination was Lisinopril+ Nifedipin (calcium channel blockers). This is in line with the recommendation for diabetic-hypertensive patients. (American Diabetes Association. 2005; Chobanian *et al* 2003; Kidney disease Outcomes Quality Initiative (K/DOQI) 2004).

The use of potentially inappropriate medications occurred in more than half of the case notes. The use of potentially inappropriately medications can have

profound medical and safety consequences for older adults and economically affect the health system.( Fick *et al* 2003).

Caution must be exercised by the prescribers for this vulnerable group of patients. Aside complying with the recommended guidelines for treatment, effective strategies to optimize the treatment of patients with concomitant hypertension and type 2 Diabetes should be employed.

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