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Research Article

Identification and resolution of drug therapy problems among hypertensive patients receiving care in a Nigerian - A pilot study

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Abstract

Background: An event involving drug therapy that actually or potentially interfers with the desired health outcomes is known as drug therapy problem.

Objective: The study aimed to identify and resolve potential drug related problems encountered among adult hypertensive patients receiving care in a Nigerian Tertiary Hospital. Methods: This was a prospective cross sectional study. The data were collected from the patients' medical records using the Pharmaceutical Care Network Europe (PCNE) Classification tool Version 6.2 (PCNE, 2010). For each of the 171 medical records, the DTPs experienced within the study period were identified. Data were analyzed using the IBM Statistical Product and Service Solutions (SPSS) for Windows, Version 21.0 (IBM Corp, Version 21.0, and Armonk, NY, USA).

Results: Majority of the patients were above 65years of age 64(37.4%), while about half of the patients were females. A total of 644 drug therapy problems were identified. The major cause of DTP was prescribing error 189(29.3). Other causes of drug therapy problem identified in this study were inappropriate drug selection 122(18.9), no indication for drugs 52(8.1), inappropriate drug combination 87(13.6), new indication presented 61(9.5), dose too high 62(9.6), dose too low 44(6.8), wrong drug taken/administered 27(4.2). Majority of the interventions made were accepted 586(91.0%) while only 3(0.5%) of the interventions made were not accepted.

Conclusion: This study demonstrates that a pharmacist, with adequate training and support can play a vital role in identifying and resolving drug therapy problems. Also, there is a need for an educational intervention among prescribing physicians to update them regularly on hypertension guidelines.

More Information

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Introduction

An event involving drug therapy that actually or potentially interferes with the desired health outcomes is known as drug therapy problem [1]. Drug therpy problems is defined by the World Health Organization (WHO) as "any response to a drug which is noxious and unintended and which occurs at doses normally used in man for prophylaxis, diagnosis or therapy of disease, or for the modification of physiological function" [2]. Hypertension is the most common cardiovascular disease. In a surveyed carried out in 2009, hypertension was in 28% of American adults and 60% of adults 65 years or older [1]. The prevalence varies with age, race and education. According to some studies, 60% - 80% of both men and women will develop hypertension by age of 80 [3]. Analysis of the global burden of hypertension revealed that over 26% of the world's adult population had hypertension in 2000, and has shown a rapid increase in prevalence affecting significant numbers of individuals in Sub-Saharan Africa [4].

Studies worldwide indicate that despite the availability of effective medical therapy, more than half of hypertensive patients on treatment have blood pressures over 140/90 mm Hg threshold [5]. This is mostly because of drug therapy problems which include but not limited to non-compliance, ADRs, improper drug selection and drug interactions.

The occurrence of a DTP among hypertensive patients

could prevent or delay patients from achieving desired therapeutic goals [6]. It has been attributed to unnecessary over-prescription of drugs, substantial worsening of diseases, avoidable increases in hospital admission rates, and longer hospital stays leading to a significant medical burden [7]. As a result, substantial numbers of patients do not get the maximum benefit of medical treatment, resulting in poor health outcomes, lower quality of life, increased health care costs and erodes public confidence in health systems [8].

Objective

This study aimed to assess the Knowledge, attitude and practice towards hypertension among hypertensive patients receiving care in a Nigerian hospital.

Methods

Study design: This was a prospective study which involved the medical records of Adult hypertensive patients receiving care in a tertiary hospital in Kogi state, Nigeria.

Ethical committee approval: Ethical approval was obtained from the Health Research and Ethics Board of the Kogi State Specialist Hospital, Ministry of Health Kogi State before commencement of the study.

Eligibility criteria: The eligibility criteria included all the folders of hypertensive with Diabetes comorbidity outpatients who received prescription from the hospital within the study period (August-September 2019).

Sample size calculation: All folders that fell within the eligibility criteria were utilized for the study. A total of 171 patient folders were used.

Data collection

The data were collected from the patients' medical records using the Pharmaceutical Care Network Europe (PCNE) Classification tool Version 6.2 (PCNE, 2010). For each of the 171 medical records, the DTPs experienced within the study period were identified. The demographic information such as age and gender were recorded. Other items documented were the drugs implicated in the therapy problems, type of drug therapy problem, cause of drug therapy problem (DTP), type of intervention and the outcome of intervention. The PCNE V 6.2 has 4 primary domains for problems, 8 primary domains for causes and 5 primary domains for interventions. On a more detailed level, there are 9 grouped sub-domains for problems, 37 grouped sub-domains for causes and 17 grouped sub-domains for interventions. The sub-domains are explanatory for the principal domains.

Data analysis

Data were analyzed using the IBM Statistical Product and Service Solutions (SPSS) for Windows, Version 21.0 (IBM Corp, Version 21.0, and Armonk, NY, USA).

Results

Majority of the patients were above 65years of age 64(37.4%), while about half of the patients were females. Also, most of the patients were traders 62(36.3%), 146(85.4%) were married, 146(79.1%) were Christians by religion and 164(95.9%) were currently non-smokers as at the time of the study (Table 1).

A total of 644 drug therapy problems were identified. Some of the drugs involved in DTP were, methyl dopa, frusemide, Nifedipine, lisinoril, metformin, metronidazole, analgesics like diclofenac, ibuprofen and paracetamol (Table 2).

The major cause of DTP was prescribing error 189(29.3). Other causes of drug therapy problem identified in this study were inappropriate drug selection 122(18.9), no indication for drugs 52(8.1), inappropriate drug combination 87(13.6), new indication presented 61(9.5), drug too high 62(9.6), drug too low 44(6.8), wrong drug taken/administered 27(4.2) (Table 3).

Majority of interventions made were on drug level 288(44.7%), while 183(28.4%) were made on patient level. Also, 152(23.6%) of the interventions were made on prescriber level while 21(3.3%) of the DTPs had no intervention (Table 4).

Majority of the interventions made were accepted 586(91.0%) while only 3(0.5%) of the interventions made were not accepted (Table 5).

Table 1: Demographic characteristics of patients.

Characteristics	Frequency	Percentage
Age		
18-25	1	0.6
26-35	7	4.1
36-45	19	11.1
46-55	28	16.4
56-65	52	30.4
> 65	64	37.4
Gender		
Male	84	49.1
Female	87	50.9
Employment status		
Civil servants	21	12.3
Trader	62	36.3
Famer	44	25.7
Unemployed	8	4.7
Retired	20	11.7
Self employed	16	9.4
Marital status		
Single	10	5.8
Married	146	85.4
Separated	0	0
Divorced	0	0
Widowed	15	8.8
Religion		
Christian	166	97.1
Muslim	1	0.6
Pegan	4	2.3
Smoking status		
Current smoker	4	4.1
Non-current smoker	164	95.9

Table 2: Drugs Involved With Identified Drug Therapy Problems.

Name of medication	Drug therapy problem	*n* (%)
Methyldopa + frusemide	Enhanced hypotensive effect	112(17.4%)
Artesunate + Vitamin C	Inhibition of the oxidation of artemisinin derivatives by vitamin C	101(15.7)
Arthemether/ Lumefantrine+ Vitamin C	Inhibition of the oxidation of artemisinin derivatives by vitamin C	92(14.3)
Aspirin 75mg	No direction for use	84(13.0)
Nifedipine	Dose too high	59(9.2)
Lisinopril	No direction for use	58(9.0)
Methyldopa	No direction for use	55(8.5)
Metformin	Dosage too low	22(3.4)
Artesunate	No direction for use	15(2.3)
Metronidazole	No indication for drug	14(2.2)
Diclofenac+ Ibuprofen	Wrong drug combination	11(1.7)
Artesunate	Dosage too low	9(1.4)
Artemether/Lumefantrine	Dosage too low	7(1.1)
Others		5(0.8)

*Others: spirinolactone, valsartan, hydrochlorothiazide, paracetamol, loperamide.

Table 3: Causes of Drug therapy Problem.

Variables	*n* (%)
Drug selection	
Inappropriate drug	122(18.9)
No indication for drug	52(8.1)
Inappropriate drug combination	87(13.6)
New indication presented	61(9.5)
Dose selection	
Drug too high	62(9.6)
Drug too low	44(6.8)
Drug use process	
Wrong drug taken/administered	27(4.2)
Prescribing error	189(29.3)

Table 4: Types of intervention.

Variable	*n* (%)
No intervention	21(3.3)
Prescriber level	152(23.6)
Drug level	288(44.7)
Patient level	183(28.4)

Table 5: Outcome of intervention.

Variable	*n* (%)
Intervention accepted	586(91.0)
Intervention not accepted	3(0.5)
Outcome unknown	55(8.5)

Discussion

Various drug combinations were responsible for the DTPs which may have resulted to therapy failure or adverse drug reactions. The use of methyldopa with frusemide constituted the major drug therapy problems in this study. Majority of the identified DTPs were due to adverse reactions. Most of the respondents were above 65 years of age, female and taking more than two medications. This is supported by the findings that adverse drug reactions occur mainly in young and middle aged adults and are twice as common in women [10]. From this study, patients who were on more than one medication experiences DTP more than those that were on a single medication. The use of multiple medications predisposes patients to adverse drug reactions [11]. Most of the patients in this study were on more than three drugs. Some of these medications may also predispose the patients to other disease states as a study showed that the long duration of therapy with beta-2 agonists positively correlated with the incidence of hypertension [12]. Our findings establish that prescribing error and inappropriate drug combinations were the major cause of drug therapy problems. This contrasts the results obtained in a recent study on drug therapy problems in adult hypertensive patients where about 40% of the drug therapy problems were due to non-adherence to medication (66%) [13]. Several studies have shown that most DTPs (48.75%) were from potential drug interactions [14]. Pharmacists can help in the making the right choice of drugs and possible combinations. Also, counselling can improve patient adherence and the outcome of therapy [14]. Inappropriate drug selection may be due to inappropriate prescribing. Less than a quarter of the DTPs had no documented interventions which might have stemmed from poor attitudes to documentation and poor patient-care approach. From the interventions documented, more than three-quarter had known intervention outcomes. Poor drug history documentation may lead to medication errors [15]. Health professionals should document appropriately to minimize or eliminate medication errors. Pharmacists' participation in medication history documentation might significantly increase the frequency and depth of medication history information documented [15].

Conclusion

This study demonstrates that a pharmacist, with adequate training and support can play a vital role in identifying and resolving drug therapy problems in the hospital. Also, there is a need for an educational intervention among prescribing physicians to always keep them abreast with the current hypertension guidelines.

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