

Research Article

Knowledge of Hypertensive Patients With or Without HIV on Hypertension and Their Experience in Using Their Medicines in Dar es Salaam, Tanzania: The Role of the Pharmacist

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Abstract

Purpose: The study assessed the knowledge of both HIV and non-HIV hypertensive patients on hypertension and the role of pharmacists in their pharmaceutical care.

Methods: The study was conducted at the hypertension and HIV clinics in government hospitals in Dar es Salaam, Tanzania. Patients were interviewed using a structured questionnaire and pharmacists were assessed using a self-administered questionnaire and by observation.

Results: Few patients in both groups knew the names of antihypertensive medicines they were taking. Information on the use of antihypertensive and antiretroviral (ARV) medicines was mostly provided by doctors. Adverse drug reactions were significantly more when patient used both ARVs and antihypertensive medicines than when they used only antihypertensives. Only 20 % of hypertensive-HIV patients informed the pharmacist dispensing antihypertensive medicines that they were using ARVs, and only 19 % of the pharmacists knew the drug interactions between ARVs and antihypertensive medicines. During dispensing, about 2 % of the patients were asked about other medicines being used.

Conclusion: There is a need to improve patients' knowledge of hypertension. The pharmacists should also have up-to-date knowledge of hypertension-HIV co-morbidity. Proper coordination between HIV and hypertension clinics and the full integration of a pharmacist in the health care team can help to improve patient care.

Keywords: Hypertension, HIV/AIDS, Antiretroviral medicines, Antihypertensive medicines, Adverse drug reaction, Dispensing, Knowledge

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INTRODUCTION

Hypertension is one of the chronic diseases affecting people especially those living in urban areas. The prevalence of hypertension in the urban areas of Tanzania is about 30 % [1]. In the HIV-infected population, the prevalence of hypertension is around 13.1 % [2] while for those patients on highly active antiretroviral therapy (HAART), it is around 21 % [3]. The use of HAART for the treatment of HIV infection is associated with the development of cardiovascular risk factors, including hypertension, hyperlipidemia, diabetes mellitus, impaired glucose tolerance, and visceral fat deposition [2,4].

Patients who are both HIV-positive and hypertensive are likely to be receiving multiple drug therapy as a result of medical complications associated with the disease and therefore, need intervention by a pharmacist. It has been observed that in Tanzanian public health facilities, a pharmacist is not an integral part of the health care team [5]. Consequently, patients are deprived of useful information regarding their disease, medication and quality of life issues. The various complications which result from multiple drug therapy in these patients have not been determined. In addition, the level of involvement of the pharmacist in the management of these patients in Tanzania has not been assessed.

This study, therefore, focused on assessing the knowledge of hypertension among two groups of patients: hypertensive-only and hypertensive-HIV patients. The involvement of pharmacists in the counselling of these patients was also assessed. In addition, the study assessed problems which were encountered by both groups of patients in the course of using anti-hypertensive and ARV medicines alone or in combination. Pharmacists' knowledge of hypertension and cardiovascular effects due to ARV use were also assessed.

METHODS

This was a cross-sectional descriptive study conducted at hypertension and HIV clinics at four government hospitals, as well as at community pharmacies in Dar-es-Salaam, Tanzania, for a period of three months from July to September 2007.

Convenience sampling method was used. Two hundred (200) hypertensive-only patients on anti-hypertensive medicines and 200 hypertensive-HIV patients on both ARVs and anti-hypertensive medicines attending the clinics who consented to participate in the study were recruited and interviewed using questionnaires. Children, pregnant women and those not using medications were excluded from the study. A total of 100 pharmacists who consented to participate in the study were also recruited and assessed using a self-administered questionnaire in both hospital and community pharmacies. One hundred (100) dispensing encounters at the HIV clinics were observed.

Ethical clearance was obtained from the Ethical Review Committee of Muhimbili University of Health and Allied Sciences.

Data analysis

Statistical Package for Social Sciences (SPSS), version 11.5 for Windows, was used for data analysis. Frequencies and percentages were determined and Chi square test was used to test for statistically significant differences

RESULTS

The demographic characteristics of the patients are shown in Table 1. A majority of the hypertensive-only patients were in the age groups 40 – 59 (46.5 %) and 60+ (47.5 %) while a majority of hypertensive-HIV patients (61 %) were middle-aged (40 – 59 years). The mean age for the hypertensive-only patients was 57.8 years (range: 27 to 102 years) and for the hypertensive-HIV

Table 1: Social demographic characteristics of patients

Variable	Hypertensive-only patients		Hypertensive-HIV patients	
	Frequency	(%)	Frequency	(%)
Age group(yr)				
<40	12	6	52	26
40-59	93	46.5	122	61
60+	95	47.5	26	13
Sex				
Male	69	35.5	62	31
Female	131	65.5	138	69
Education level				
No formal	74	37	44	22
Primary	98	49	116	58
Secondary	21	10.5	36	18
Post-secondary	7	3.5	4	2
Occupation				
Employed	58	29	84	42
Unemployed	142	71	116	58

Table 2: Knowledge of patients and source of information on hypertension

Knowledge	Hypertensive-only		Hypertensive-HIV	
	Frequency	%	Frequency	%
Name of disease	200	100	200	100
Symptoms of hypertension	120	60	96	48
Consequences of untreated hypertension	81	40.5	58	29
Names of antihypertensive medicines being used	48	24	26	13
Source of information on hypertension				
Peer	142	71	152	76
Media	13	6.5	45	22.5
Formal education	1	0.5	-	-

patients, it was 47.1 years (range: 21 to 80 years). The male/female ratio was low in each group with females being twice as many as males. This finding was comparable in both groups. A majority in each of the patient groups had primary level education; more than a half of the subjects in both groups (71% and 58%) were unemployed.

Table 2 shows the results of the knowledge of patients about their disease conditions and the source of information. Only a few of the hypertensive patients in both groups knew the names of anti-hypertensive medicines they were using. The biggest source of

information on hypertension was from peer groups. The level of knowledge of the symptoms of hypertension was significantly higher in the hypertensive-only group (60 %) than the hypertensive-HIV group (48 %) (Chi square = 5.79; $p < 0.05$; $df = 1$). Of the two groups, hypertensive-only (40.5 %) and hypertensive-HIV (29 %) patients were not aware of the consequences of uncontrolled/untreated hypertension. Both groups reported that they were informed about the types of lifestyle modification required in their present disease conditions. The most prevalent reported lifestyle changes were low salt intake, exercise, a diet rich in

Table 3: Involvement of health workers in counseling of hypertensive and HIV patients

Type of information	Person giving information (%)		
	Doctor	Nurse	Pharmacist
Symptoms of hypertension	24.5	0.5	0
Life style changes	62.5	5	1
Use of ARV drugs	44.5	47.5	23
Use of antihypertensive drugs	94	3	2.5
Consequences of untreated hypertension	8.5	0.5	0.5
Caution on side effects of ARVs and antihypertensive medicines	37.5	52.5	16

fruits and vegetables, low alcohol and no smoking.

As Table 3 shows, doctors were a more frequent source of information on hypertension and ARVs than pharmacist

Information to the dispenser by the patient regarding ARV use

Only 20 % of the hypertensive-HIV patients informed the dispenser at the hypertension clinic that they were using ARVs as well. On the other hand, 36 % of the hypertensive-HIV patients informed the dispenser at the HIV clinic that they were using anti-hypertensive medicines.

Adverse drug reactions (ADRs) faced by both patient groups

The number of hypertensive-HIV patients who developed hypertension before HIV and were on anti-hypertensive medicines prior to being placed on ARVs was 104 (52 %) while those who developed hypertension after knowing their HIV status and were on ARVs prior to being placed on anti-hypertensive medicines were 96 (48 %).

Some of the hypertensive-HIV patients (22%) reported that they experienced ADRs while using anti-hypertensive medicines alone prior to being placed on ARVs. However, when these patients began to use ARVs in combination with the anti-hypertensive

medicines, ADRs increased significantly (84.6 %; Chi-square = 81.833; $p < 0.05$; $df = 1$). Likewise, a majority of the hypertensive-HIV patients who were on ARVs alone (82.3 %) experienced ADRs. However, these ADRs were significantly higher (92.7 %) when they used a combination of ARVs and anti-hypertensive medicines (Chi-square = 4.766; $p < 0.05$; $df = 1$).

Fatigue (Chi square = 6.1523; $p < 0.05$; $df = 1$) and headache (Chi square = 4.246; $p < 0.05$; $df = 1$) were more common in the hypertensive-HIV group than in the hypertensive-only group. In those patients who were using anti-hypertensive medicines prior to being placed on ARVs, fatigue and GIT disturbances were less frequently but when used in combination with ARVs, these ADRs were more frequent (fatigue, Chi-square = 19.82; $p < 0.05$; $df = 1$; and GIT disturbances, Chi-square = 57.86; $p < 0.05$; $df = 1$). However, in patients who were using ARVs prior to taking anti-hypertensive medicines, fatigue and drowsiness were less frequently reported but when used in combination with the anti-hypertensive medicines these ADRs were occurred more frequently (fatigue, Chi-square = 118.77; $p < 0.05$; $df = 1$; and drowsiness, Chi-square = 45.59; $p < 0.05$; $df = 1$).

Drowsiness (Chi-square = 6.25; $p < 0.05$; $df = 1$), rash (Chi-square = 6.79; $p < 0.05$; $df = 1$) and nightmares (Chi-square = 10.13; $p < 0.05$; $df = 1$) occurred significantly more in

hypertensive-HIV patients who were on ARVs alone prior to being placed on anti-hypertensive medicines than in those who were on anti-hypertensive medicines alone prior to being placed on ARVs.

Pharmacists' knowledge of hypertension and anti-hypertensive agents

Table 4 presents data on pharmacists' knowledge of hypertension. Only 15 % of pharmacists could clearly define hypertension. Their knowledge on different antihypertensive medicines is shown in Table 4.

Table 4: Knowledge of pharmacists on hypertension

Knowledge item	%
Definition of hypertension	15
Goals of treatment of hypertension	95
Types of hypertension	9
Causes of secondary hypertension	67
Signs and symptoms of hypertension	98
Complications of untreated hypertension	98
Risk factors of hypertension	90
Type of lifestyle modification	100
Drugs which induce hypertension	73
Types of anti-hypertensive medicines contraindicated in:	
<i>Diabetes</i>	59
<i>Asthma</i>	75
<i>Heart failure</i>	10
Antihypertensive drug of choice in heart failure and diabetes	13
Drug interaction between antihypertensive medicines and other medicines	35
HIV associated Hypertensive problems due to ARVs	10
Drug- drug interaction between the ARVs and anti-hypertensive medicines	19

Patient counseling

Of the 100 patients observed during the drug dispensing process, no patient was counseled on drug-drug interactions while only 2 % were asked if they were using other types of medications. Figure 1.

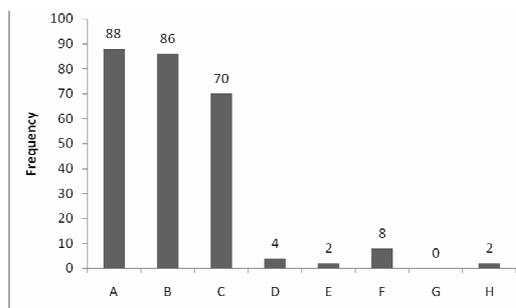


Figure 1: Counseling of hypertensive-HIV patients on the use of ARVs by pharmacists (A= Name and description of the medication; B= Instructions on the use of medications; C=Frequency and duration of therapy; D=Food drug interaction; E=Asked about other medicines being used; F=Precaution on common side effects; G= Drug-drug interactions; H= What to do if the dose is missed)

DISCUSSION

The results obtained indicate that both groups of patients were not knowledgeable about specific factors related to hypertension such as symptoms of hypertension, consequences of uncontrolled hypertension, names of anti-hypertensive medicines they are using, and specifically their own level of blood pressure control. Lack of knowledge of hypertension can result in uncontrolled blood pressure. Studies have shown that about 50 – 75 % of patients being treated for hypertension do not have adequate control of their blood pressure due to lack of knowledge of hypertension [6-9].

The median duration of hypertension for the hypertensive-only group was 6 years and for the hypertensive-HIV group was 2 years, suggesting that though these patients have had this condition for a fair long time, their knowledge of the disease was inadequate. The level of knowledge of symptoms of hypertension was significantly higher in the hypertensive-only group and this could be due to the counseling being carried out in the hypertension clinic whereby focus is on hypertension only while in the HIV clinic, counseling emphasis is on HIV only. Thus,

the hypertensive-HIV patient might tend to attach more importance to HIV than hypertension.

Both groups of patients did not know the names and strength of the anti-hypertensive medicines they were using. Thus, if they experienced any adverse drug reaction or any other problems they would not be able to report which drug caused it. Moreover, they would not be able to inform the doctor or pharmacist which medicines they were using. Not knowing the consequences of uncontrolled hypertension can lead to patients not adhering to their medications thus leading to uncontrolled hypertension, leading eventually stroke, end organ damage (such as renal failure), heart failure or myocardial infarction, and blindness. A previous study has shown that patients who were aware that elevated blood pressure levels leads to reduction in life expectancy had a greater compliance level with medication use and follow up visits than patients without this awareness [10].

In this study 22.1 % of the hypertensive-HIV and 23 % of the hypertensive-only patients developed at least one ADR when they were on anti-hypertensive medicines alone. This rate is higher than the 15.3 % previously reported in a similar study conducted in Denmark [11] but similar to the one reported by Gholami 2008 in Tehran [12]. This difference may be due to differences in the populations studied, types and number of drugs used by the patients, the definition used for ADR and susceptibility of patients to adverse reactions induced by anti-hypertensive medicines.

Hypertension and HIV are both chronic diseases and therefore, the use of medicines is life-long. In this study, ADRs were significantly more frequent when a combination of ARVs and anti-hypertensive medicines were used than when either of these medicines was used. Studies have shown that antihypertensive medicines, when

used together with ARVs, tend to increase the side-effects of the latter [4].

The type of ADRs experienced when anti-hypertensive medicines were used alone in the hypertensive-HIV patients were almost similar to that experienced by the hypertensive-only patients. Fatigue and headache occurred more frequently in hypertensive-HIV patients than in hypertensive-only patients. This could be due to the combined effect of the two medication types as both HIV and anti-hypertensive medicines cause fatigue and headache. The incidence of drowsiness was higher after hypertensive-HIV patients were placed on anti-hypertensive medicines than when they were using ARVs alone. Drowsiness is often associated with the use of anti-hypertensive medicines.

Pharmacists in Dar es Salaam were not very knowledgeable on HIV and hypertension. A majority of the pharmacists (90 %) were not aware of any HIV-related hypertensive problems. Furthermore, a majority (81 %) of them also did not have any knowledge of interactions between ARVs and anti-hypertensive agents. This situation is different from those of other countries where pharmacists have co-managed with doctors hypertensive patients well [13].

The patient's last stop is usually the pharmacy where the pharmacist dispenses the medicines and advises patients on their use. Thus, it is important that pharmacists have up to date knowledge so that they can assist in patient education, which can assist HIV patients to minimize problems such as drug-drug interactions, non-adherence to medications and adverse drug reactions. In this study, it both groups of patients that patient education regarding their disease conditions and medication was mostly provided by doctors and nurses. The pharmacist was practically not involved in patient education in this regard. This is likely due to the fact that in Tanzania, hypertension clinics usually do not engage pharmacists. In

this context, even if the pharmacist were to be engaged by the clinics, the pharmacist still faces certain obstacles. For instance, the current patient card of the HIV patients does not provide for the previous medication history of the patient. Thus, the pharmacist would not know whether the patient is hypertensive or not and what medications he/she is currently using. This study has revealed that patients did not know the names of the medicines they are taking. Furthermore, in the hypertensive clinic, the patient may not want to reveal his/her HIV status and hence the pharmacist is handicapped to counsel on side effects and drug interaction. Ultimately, the patient is the loser, in that he misses out on important information regarding his disease condition likely drug interactions and ADRs.

CONCLUSION

There is a need to improve the patients' knowledge and awareness of hypertension so as to reduce the morbidity and mortality associated with hypertension. Proper coordination between HIV and hypertension clinics, as is the case for HIV and TB clinics, should help in improving patient care. At the moment, pharmacists in Tanzania are not fully integrated into the primary health care team. Pharmacists' skills should be tapped to assist patients with their long-term medicines use. This also requires that pharmacists' knowledge should be updated regularly.

REFERENCES

1. Edwards R, Unwin N, Mugusi F, Whiting D, Rashid S, Kissima J, Aspray TJ, Alberti KG. Hypertension prevalence and care in an urban and rural area of Tanzania. *J Hypertens* 2000; 18 (2): 145-152.
2. Jericó C, Knobel H, Montero M, Sorli ML, Guelar A, Gimeno JL, Saballs P, López-Colomé JL, Pedro-Botet J. Hypertension in HIV-Infected Patients: Prevalence and Related Factors. *Am J Hypertens*. 2005; 18(11): 1396 – 1401
3. Bergersen BM, Sandvick L, Dunlop O, Birkeland K, Bruun JN. Prevalence of hypertension in HIV-Positive patients on highly active retroviral therapy (HAART) compared with HAART-naive and HIV-negative controls: Results from a Norwegian study of 721 patients *Eur J Clin Microbiol Infect Dis* 2003;22(12): 731-736
4. Friis-Møller N, Weber R, Reiss P, Thiébaud R, Kirk O, d'Arminio Monforte A, Pradier C, Morfeldt L, Mateu S, Law M, El-Sadr W, De Wit S, Sabin CA, Phillips AN, Lundgren JD; DAD study group. Cardiovascular disease risk factors in HIV patients—association with antiretroviral therapy. Results from the DAD study. *AIDS*. 2003; 17(8): 1179-1193.
5. Zungufya L. The role of pharmacists in diabetes care. A case study in Zanzibar and Dar es Salaam region, Tanzania. 2004; A dissertation submitted to Muhimbili University College of Health Sciences (MUCHS), Dar es Salaam Tanzania for the partial fulfillment of the Master of Pharmacy Degree. pp ix.
6. JNC VI 1997. The sixth report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC VI). *Arch Intern Med*. 1997; 157: 2413–2446
7. Stockwell DH, Madhavan S, Cohen H, Gibson G, Alderman MH. The determinants of hypertension awareness, treatment, and control in an insured population. *Am J Public Health*. 1994; 84: 1768–1774.
8. Berlowitz DR, Ash AS, Hickey EC, et al. Inadequate management of blood pressure in a hypertensive population. *N Engl J Med*. 1998; 339: 1957–1963.
9. Gu D, Reynolds K, Wu X, Chen J, Duan X, Muntner P, Huang G, Reynolds RF, Su S, Whelton PK, He J. Prevalence, awareness, treatment, and control of hypertension in China. *Hypertens* 2002; 40: 920-927
10. Muntner P, Gu D, Wu X, Duan X, Wenqi G, Whelton PK, He J. Factors Associated with Hypertension Awareness, Treatment, and control in a Representative Sample of the Chinese population *Hypertens* 2004; 43: 578-585
11. Davidson F, Haghfelt T, Gram LF, Brosen K. Adverse drug reactions and drug non-compliance as primary cause of admission to a cardiology department. *Eur J Clin Pharmacol*. 1988; 34: 83-86.
12. Gholami K, Ziaie S, Shalviri G. Adverse drug reactions induced by cardiovascular drugs in outpatients. *Pharmacy Practice* 2008; 6(1): 51-55.
13. Borenstein JE, Graber G, Saltel E, Wallace J, Ryu S, Jackson A, Deustsch S, Weingarten SR, Physician-Pharmacist co management of hypertension: A randomized comparative trial *Pharmacotherapy* 2003; 23(2): 209-216.