



Identification of drug therapy problems in patients with chronic kidney disease

Ogheneovo Clement Aghoja^{1*}, Valentine Uche Odili², Ejiro Akpovwovo³

¹Department of Clinical Pharmacy and Pharmacy Administration, Faculty of Pharmacy, Delta State University, PMB 1, Abraka, Delta State, Nigeria.

²Department of Clinical Pharmacy and Pharmacy Practice, Faculty of Pharmacy, University of Benin, PMB 30001, Benin City, Edo State, Nigeria.

³Department of Pharmaceutical Services, Delta State University Teaching Hospital, Oghara, Delta State

Received 4th June 2019; Accepted 31st July 2019

Abstract

Drug therapy problems (DTPs) are common in patients with chronic kidney disease because of the complexity of their drug regimen and can adversely affect their desired treatment outcome. Often, there are co-morbidities, this imply concomitant use of many drugs, thus making the management of these patients particularly challenging. This was a prospective, cross-sectional study undertaken in the Renal Unit of the Medical Outpatient Department of Central Hospital Warri and the Department of nephrology Delta state University Teaching Hospital Oghara over a period of one year. The prescriptions of the patients were screened for drug therapy problems using the Medscape drug information application version 5.12. The identified drug related problems were documented in the drug therapy problem documentation form. More than half, 120(65.93%) of the respondents had two or more DTPs, 87(47.80%) 1 or 2 and 62(34.07%) no DTPs. Overall, the total number of patients with DTPs were 120(65.93%). Respondents with serious drug interactions were 10(13.51%), 62(83.7%) significant, and 17(22.97%) had minor drug interactions. Of the 120(65.93% DTPs identified, 13(7.4%) was wrong drug, 120(65.90%) inappropriate adherence and 74(40.66%) drug interactions. There is a high occurrence of drug therapy problems (DTP) among the chronic kidney disease patients treated in the surveyed facilities.

Keywords: Drug therapy problems; Kidney disease

INTRODUCTION

Globally, the number of renal patients receiving renal replacement therapy is estimated at more than 1.4 million [1]. Chronic kidney disease and end stage renal disease are usually associated with increased rate of hospitalization, increased risk of morbidity and mortality as well as decreased life expectancy [2]. Drug therapy problems (DTPs) are common in patients with chronic kidney disease because of the complexity of

their drug regimen and can adversely affect their desired treatment outcome. Often, there are co-morbidities, this imply concomitant use of many drugs, thus making the management of these patients particularly challenging.

Drug therapy problems increase with increase in the number of drugs prescribed. Pharmacists have a huge role to play in the management and treatment of renal disease because it is their duty to prevent drug

* Corresponding author. *E-mail:* stmajella@yahoo.co.uk *Tel:* +234 (0) 8028427771

therapy problems before they occur and to identify and resolve the ones already in existence.

In chronic kidney disease, the number and complexity of drugs increase with the progression of the disease and the presence of co-morbidities. This in turn results in high risk of non-adherence, adverse drug reactions and drug interactions. Several studies have shown that patients with chronic kidney disease and end stage renal disease are among those at high risk of experiencing drug therapy problems [3-5].

However, there are limited studies in developing countries like Nigeria resulting in lack of adequate knowledge on the prevalence of drug therapy problems among patients with chronic kidney disease. This therefore underscores the need to determine the extent and type of drug therapy problems among patients with chronic kidney disease. The findings of this study will assist pharmacists to identify patients with chronic kidney disease at risk of drug therapy problems and develop appropriate intervention. Additionally, this study will also help to develop an appropriate guideline for the management of chronic kidney disease. The objectives of this study was to identify drug therapy problems in patients with chronic kidney disease.

METHODS

Study design. This was a prospective, cross-sectional study undertaken in the Renal Unit of the Medical Outpatient Department of Central Hospital Warri and the Department of nephrology Delta state University Teaching Hospital Oghara over a period of one year.

Setting. Central Hospital Warri is a secondary health care institution with 252 beds, located in the heart of Warri South Local Government area of Delta State. Among other specialties, the hospital has a renal unit with two consultant nephrologists and five dialysis machines. One of the dialysis machines

dedicated to renal patients who are HIV positive and those who have hepatitis. The hospital has a very high patient traffic compared to other secondary health institutions with an in- and out-patients' attendance rate of 10,574 and 1,083,079 respectively per year.

Delta State University Teaching Hospital (DELSUTH), Oghara is a two hundred and twenty (220)-bed hospital with a high patient traffic because of its uniqueness in the area, medical care and also being the only teaching hospital in the state. The hospital has a nephrology department with two consultant nephrologists, three senior registrars and seven registrars. The department has eight dialysis machines with three of the dialysis machines dedicated to renal patients who are HIV positive and those who have hepatitis.

Inclusion criteria. All adult patients diagnosed with chronic kidney disease and attending the renal clinic in the two health care facilities.

Exclusion criteria. Patients who are too ill to participate in the study.

Sampling size and sampling technique. All the consenting patients that met the inclusion criteria were consecutively recruited during the period of the study.

Instrument for data collection. The prescriptions of the patients were screened for drug therapy problems using the Medscape drug information application version 5.12. Medscape identifies and highlights all the interactions in a prescription and rates them into the following categories:

- a) Serious
- b) Significant
- c) Minor

The identified drug related problems were documented in the drug therapy problem documentation form.

Ethical consideration. Ethical approval was obtained from the ethics committee of the two hospitals prior to the commencement of the study

Data management and analysis. The collected data was coded and entered into SPSS version 20.0 and analyzed. The various variables were expressed as simple frequencies and percentages. The Statistical Package for Social Sciences (SPSS) was used for the inferential statistics with the p-value set at less than 0.05.

RESULTS

Of the 182 respondents who participated in the study, 85 (46.7%) were males while 97 (53.3%) were females. The mean age of the respondents was 51.25 ± 16.61 years. Majority of the respondents were married 150 (82.4%), engaged in business 69 (38.5%) and neither smoked 168 (92.3%) nor drank alcohol 154 (84.6%). The demographic details are as shown in Table 1.

Overall, the average number of drugs per prescription for this study was 5.20 ± 1.97 . The average number of drugs per prescription for respondents from Central Hospital Warri was 6.38 ± 2.58 and 4.01 ± 1.35 for respondents from DELSUTH Oghara. There was a statistically significant difference between the average number of drugs in Central Hospital Warri and DELSUTH Oghara, $p < 0.05$.

More than half, 120 (65.9%) of the respondents had two or more DTPs, 87 (47.8%) 1 or 2 and 62(34.1%) no DTPs.

Overall, the total number of patients with DTPs were 120 (65.9%). Respondents with serious drug interactions were 10 (13.5%), 62 (83.7%) significant, and 17 (22.9%) had minor drug interactions.

Of the 120 (65.9% DTPs identified, 13(7.4%) was wrong drug, 120 (65.9%) inappropriate adherence and 74 (40.6%) drug interactions.

Table 1: Socio-Demographics of Respondents

		Freq	Percentage	X	S.D
Center	Central Hospital, Warri	102	56		
	DELSUTH	80	44		
Age				51.25	16.61
Sex	Male	85	46.7		
	Female	97	53.3		
Marital Status	Single	30	16.5		
	Married	150	82.4		
	Divorced	2	1.1		
	Student	16	8.9		
Occupation	Tailoring	8	4.5		
	Civil Servant	41	22.9		
	Trading (Business)	69	38.5		
	Farming	2	1.1		
	Contractor	3	1.6		
	Plumbing	2	1.1		
Alcohol	Pensioner	41	22.9		
	No	154	84.6		
Smoking	Yes	28	15.4		
	No	168	92.3		
	Yes	14	7.7		
Total		182	100.0		

DISCUSSION

This study revealed a high proportion of drug therapy problems in the patients with chronic kidney disease in the facilities studied. This might be due to the severity of the chronic kidney disease and presence of co-morbidities. This implies use of complex therapeutic regimen with five or more drugs per patient as indicated by the high average number of drugs per prescription. This underscores the need for careful and proper review of the patients' prescription, as this could be a source of increase in their drug therapy problems and cost of treatment. In the course of this study, a total of 120 drug therapy problems were identified over a period of a year and six months. This was quite high; this is similar to previous reports. Ramalho De Oliveira et al. identified 38,631 DTPs over a period of 10 years [6], Nascimento et al. identified 380 DTPs over a period of 2 Years [7], and Root et al. identified 88 DTPs from 40 patients [8]. Despite the fact that the difference in the number of drug therapy problems identified could be attributed to differences in study design, settings, duration of study and the nature of data collected as well as the method of identification of the drug therapy problems.

The unequivocal fact is that DTPs in Chronic kidney disease patients is alarming. The most common drug therapy problem in our study was inappropriate adherence. Other related studies have also reported high level of non-adherence to therapy by patients with chronic kidney disease [9,10]. On the other hand, this is inconsistent with the findings of a study by Sanchez-Gili et al. who reported low level of non-adherence in patients with chronic kidney disease [11]. Furthermore, our study revealed a high number of drug therapy problems due to potential drug interactions. This is in line with the findings of a study conducted by Ismail et al., which reported 45% potential drug-drug interactions [12]. Grabe et al., in their findings also reported

drug interactions as a major drug therapy problem in patients undergoing hemodialysis [13]. Wrong drug selection was also identified as one of the drug therapy problems in this study. This is in agreement with a number of related studies on drug therapy problems, which identified wrong drug, dosing problems and drug interactions as some of the most encountered drug therapy problems [14-16, 8, 17].

Conclusion. There is a very high occurrence of drug therapy problems (DTP) among the chronic kidney disease patients treated in the surveyed facilities.

REFERENCES

1. Moeller S, Gioberg S, Brown G (2002). End Stage Renal disease patients in 2001: global overview of patients, treatment modalities and development trends. *Nephrol Dial Transplant* 17:2017-6
2. Go AS, Charton GM, Fan D, McCulloch CE, HSU CY (2004). Chronic kidney disease and the risk of death, cardiovascular events, and hospitalization. *N Engl J Med.* 351(13): 1296-1305
3. Manley HJ, Cannella CA, Bailie GR, St Peter WL (2005). Medication-related problems in ambulatory hemodialysis patients: a pooled analysis. *Am J Kidney Dis.* 46(4):669-680.
4. Mirkov S (2009). Implementation of a Pharmacist medication review clinic for hemodialysis patients. *The New Zealand Med J.* 122(1297): 25-37
5. Belaiche S, Romanet T, Allenet B, Calop J, Zaoui P (2012). Identification of drug-related problem in ambulatory chronic kidney disease patients: a 6-Month prospective study. *J Nephrol;* 25(5): 782-788
6. Ramalho de Oliveira D, Brummel AR, Miller DB (2010). Medication therapy management: 10 years of experience in a large integrated health care system. *J Manage Care Pharm.* 16(3): 185-195
7. Nascimento YA, Carvalho WS, Acurcio FA (2009). Drugs-related problems observed in a pharmaceutical service, Belo Horizontale, Brazil. *Braz J of Pharm Sci;* 45(2)
8. Root R, Phelps P, Brummel A, Else C (2012). Implementing a Pharmacists-led medication management pilot to improve care transitions. *Innovation in Pharmacy;* 3(2)

9. Ahlawat R, Tiwari P, D'Cruz S, Singhal R (2016). Prevalence of chronic kidney disease in India: A Systematic Review and Meta-Analysis of Observational Studies. *Value Health* 18: A509.
10. Neri L, Martini A, Andreucci VE, Gallieni M, Rey LA, Brancaccio D (2011). Miglior Dialysis Study Group. Regimen complexity and prescription adherence in dialysis patients. *Am J Nephrol.* 34(1): 71-76
11. Sanchez-Gili M, Toro-Chico P, Perez-Encinas M, Gomez-Pedrero AM, Portoles-Perez JM (2011). Pharmaceutical intervention to the treatment of patients with chronic kidney disease. *J Qual Care;* 26(3): 146-151
12. Ismail M, Iqbal Z, Khan MI, Javaid A, Arsalan H, Ferhadullah, Khan F, Khan AZ, Nazir F, Khan JA (2013). *Trop J Pharm Research* 12 (3): 401-406
13. Grabe DW, Low CL, Bailie GR, Eisele G (1997). Evaluation of drug related problems in outpatient hemodialysis unit and the impact of a clinical Pharmacist. *Clin Nephrol;* 47(2): 117-121
14. Blix HS, Viktil KK, Reikvam S, Moger TA, Hjemaas BJ, Pretesch P, Flindt T, Vraalsen E, Walseth K (2004). The majority of the hospitalized patients have drug related problems: results from a prospective study in general hospits. *Eur J Clin Pharmacol.* 60(9): 651-658
15. Rahmawati F, Pramantara DP, Rohmah W, Sulaiman SOS (2009). Polypharmacy and unnecessary drug therapy on gastric hospitalized patients in Yogyakarta hospitals, Indonesia. *Int J Pharm and Pharm Sci;* 1(1): 6-11
16. Odili VU, Egiebor BO, Oparah AC (2011). Identification of Drug Therapy Problems in patients with Diabetes Treated in a Secondary Care Facility in Benin City. *Nig J Pharm Res;* 9(1): 72-81
17. Sulaiman IA, Eniojukan JF, Eze I (2012). Evaluating pharmaceutical care documentation among Pharmacists in Nigeria. *West Afr J Pharm;* 23(1): 69-75