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ASSESSMENT OF DRUG THERAPY PROBLEMS AMONG CHRONIC KIDNEY DISEASE PATIENTS IN A TERTIARY CARE HOSPITAL OF QUETTA CITY, PAKISTAN

Abdul Wahid[1], Qaiser Iqbal[2], Adnan Khalid[3], Sajjad Haider[4], Naheed Haque[5] and Fahad Saleem[6]

[1]Faculty of Pharmacy & Health Sciences, University of Balochistan, Quetta,
[2]Faculty of Pharmacy & Health Sciences, University of Balochistan, Quetta.
[3]Combined Military Hospital, Quetta.
[4]Faculty of Pharmacy & Health Sciences, University of Balochistan, Quetta.
[5]Faculty of Pharmacy & Health Sciences, University of Balochistan, Quetta.
[6]Faculty of Pharmacy & Health Sciences, University of Balochistan, Quetta.

Abstract:
Aim:The current study was aimed to identify drug related problems among chronic kidney disease patients who were diagnosed with end stage renal disease.
Methodology:A retrospective study was conducted on hospitalized patients diagnosed with end stage renal disease. Six months patients profile data was collected from the record room of the tertiary care hospital (Government Provincial Sandeman Hospital Quetta). Patients' demographic information and prescribed drugs were collected through a pre validated data collection form were analyzed for the identification of drug therapy problems. Statistical Package for Social Sciences software was used for data analysis and data was presented descriptively.
Results:A total of 202 patients profiles were assessed out of which 177 (87.62 %) were males and 25 (12.38%) were females. Average age found in the study was 42+15 years. The total number of drugs prescribed to the patients was 946 with the average of 5 drugs per prescription. Overall 501 drug related problems were identified with the average of 2.4 problems per prescription. The most commonly reported drug related problems were inappropriate dosage (146, 72.3%), drug interactions (120, 54.4%), contraindication (56, 27.7%), treatment duplicity (43, 21.2%), need of additional treatment (40, 19.8%), economic reasons (23, 11.3), adverse drug reactions (18, 8.9%), side effects (17, 8.4%) and other medication being more effective (13, 6.43%).
Conclusion:Drug therapy problems found per prescription were quite high that needs urgent attention. Within this context, the role of clinical pharmacist should be highlighted to identify, resolve and prevent drug therapy problems especially in such critical area of care.
Keywords: *Drug therapy problems, chronic kidney disease patients, tertiary care hospital, Quetta, Pakistan.*

Corresponding author:
Fahad Saleem,
Faculty of Pharmacy & Health Sciences,
University of Balochistan,
Quetta.
Email: fahaduob@gmail.com; Ph: 00923458326545

QR code

INTRODUCTION:

Chronic Kidney Disease (CKD) is continuous condition of abnormal function of the kidney for more than three months with decreased Glomerular filtration rate of less than 60 ml/min per 1.73 m^2 [1]. In terms of published literature, there is no information available about the prevalence and epidemiology of CKD in Quetta or other associated cities of Baluchistan province of Pakistan. However, according to the Pakistan based economic survey in 2005-06, nearly 21 million people in Pakistan were reported to have either stage 3 or 4 CKD. The highest prevalence rate (19%) were reported in Punjab, followed by 12% in Khyber Pakhtunkhwa and Baluchistan and 7% in Sindh (Kazmi) [18]. Multiple factors contributed towards the higher prevalence of CKD whereby aging population, high blood pressure, irrational use of the drugs especially antibiotics, NSAIDS and rising incidence of diabetes mellitus are being few of them [2]. Medication therapy to the CKD patients is complex because of the co-morbidities and the major risk associated with CKD patients.

The development of CKD and the worsening of kidney functions from stage 1 to others can be slowed by rational treatment of existing co morbidities and the risk factors and by lifestyle modification [3]. However, complex drug therapy also increases the chance of increased drug therapy problems (DTPs). Drug therapy problems are undesirable incidents or events which are experienced by the patient and such undesirable actions interferes with the desired outcome of the drug therapy, thus requiring specialized judgment and skills to resolve them [4,5]. Drug therapy problems are classified into unnecessary drug therapies, adverse drug reactions, non adherence or noncompliance, high or low doses, needs additional drug therapy and ineffective drug selection [6]. In practice, actual DTPs are problems that have occurred in a patient, whereas potential DTPs are issues that have likelihood of occurrence if appropriate interventions are not carried out by healthcare professionals [7]. Among all stages of CKD, numerous studies have shown that patients with (ESRD) are among those who are at higher risk of developing DTPs [8] .

Drug therapy problems are major challenge to health care providers and may affect morbidity, mortality and patients' quality of life. The CKD patients are on high risk for DTPs because of the polypharmacy and the impaired renal excretion [9]. Therefore, professional clinical judgment is required to resolve the DTPs and pharmaceutical care plan is needed for such patients who are suffering from CKD [10]. Keeping the issues related to DTPs among CKD patients, we designed this study to identify DTPs in end stage CKD patients attending a public hospital in Quetta city, Pakistan.

METHODS:

Study design and settings

A six month, retrospective cross sectional study was conducted among CKD patients. The study was conducted at Sandeman Provincial Hospital (SPH) which is the biggest government hospital of Quetta city and provides major healthcare facilities to the general population. The nephrology department is well established in the hospital and all facilities and modern machinery are available.

Patient selection and enrolment

Total two hundred and two (202) patient's profiles were selected from the record provided by the hospital authorities. Both male and female patients, ageing 10 years and above and diagnosed with ESRD were targeted for the study. Patients other then ESRD, immigrants and having hepatic problems were excluded from the study.

Data collection

A pre validated data collection form was designed for this study which consisted of demographics of the patients, disease and medication profile, lab examination and patient health history. Additionally, a separate form was used DRPs categorization. Both forms were validated by two independent nephrologists prior to data collection.

Drugs involved and DRPs identification

To identify potential and actual DTPs among the prescribed medications, lab examination, and patient health history, Micromedex,® Thomson Reuters, Medscape and DrugReax® system [11] were used. Once DRPs were identified, an independent clinical pharmacist was approached for confirmation of the DTPs.

Data analysis

The DTPs were coded and analyzed by using IBM Statistical Package Social Science v. 20.0. Descriptive analysis was conducted whereby frequencies and percentages were used to describe demographics characteristics. The results were expressed as percentages, numbers, range and averages.

Ethical approval

Institutional Ethical Committee, Faculty of Pharmacy and Health Sciences, University of Balochistan approved the study. Permission from the respective medical superintendent was also taken into consideration.

RESULTS:

Two hundred and two patients' profiles were collected. The mean age of the study population was 42 ± 15 years. Males dominated the cohort (177, 87.6%) as shown in Table 1.

The total no of drugs prescribed to the patients in the ward were 946 with the average of 5 drugs per prescription as shown in the Table 2. Anti hypertensive (35.1%), anti diabetic (4.0%,), iron

calcium and vitamin D supplements (50.0%), single antibiotic (96.5%), multiple antibiotics (24.8%), single GIT drug (94.1%), multiple GIT drugs (73.3%), steroids (10.4%), diuretics (30.7%), IV infusion (35.1%), analgesic & antipyretics (12.4%) and CNS drugs (2.0%) were the most commonly prescribed medicines identified from the patients record.

Table 1: Demographic characteristics of the study population

Characteristics	Frequency	Percentage
Age (42 ± 15 years)		
10-20	24	11.8
21-30	35	17.3
31-40	22	10.8
41-50	27	13.3
> 50	94	46.5
Gender		
Male	177	87.6
Female	25	12.4

Table 2: Total drugs prescribed to patients

Prescribed drugs	Total patients	Prescribed patients	Percentage
Anti hypertensive	202	71	35.1%
Anti diabetic	202	8	4.0%
Iron, calcium and vitamin D supplements	202	101	50.0%
Single antibiotics	202	195	96.5%
Multiple antibiotics	202	50	24.8%
Single GIT drugs	202	190	94.1%
Multiple GIT drugs	202	148	73.3%
Steroids	202	21	10.4%
Diuretics	202	62	30.7%
IV infusions	202	71	35.1%
Analgesics & antipyretics	202	25	12.4%
CNS	202	4	2.0%
Total		**946**	

Five hundred and one DRPs were found in 202 cases with an average of 2.4 per prescription. The most common DRPs identified were inappropriate dosage (146, 72.3%), drug interaction with drug and food (120, 54.4%), contraindication (56, 27.7%), treatment duplicity (43, 21.2%), needing additional treatment (40, 19.8%), economical reasons (23, 11.3%), adverse drug reactions (18, 8.9%), side effects (17, 8.4%) and other medication being more effective (13, 6.4%) as shown in Table 3.

Table 3: drug therapy problems identified among the study respondents

Drug related problems	Male		Female		Total	
	N	%	N	%	N	%
Need of additional treatment	39	22.2%	1	4.0%	40	19.8%
Untreated indication	1	0.5%	0	0.0%	1	0.4%
Need of combined treatment	1	0.5%	1	4.0%	2	0.9%
Not indicated	3	1.6%	0	0.0%	03	1.4%
Alternative more cost effective	11	6.1%	2	8.0%	13	6.4%
Alternative administration rout	3	1.6%	0	0.0%	3	1.4%
Treatment duplicity	34	19.2%	9	36.0%	43	21.2%
Treatment of preventable adverse effect	01	0.5%	0	0.0%	1	0.4%
No effective resistance	0	0.0%	0	0.0%	0	0.0%
Inappropriate dosage	137	77.4%	9	36.0%	146	72.3%
Other medication more effective	12	6.7%	1	4.0%	13	6.4%
Dose too low	0	0.0%	0	0.0%	0	0.0%
Inappropriate treatment duration	1	0.5%	0	0.0%	1	0.4%
Inappropriate administration	0	0.0%	0	0.0%	0	0.0%
Interaction with drug or food	100	56.4%	20	80.0%	120	59.4%
Adverse reactions	17	9.6%	1	4.0%	18	8.9%
Allergy	0	0.0%	0	0.0%	0	0.0%
Side effects	9	5.0%	8	32.0%	17	8.4%
Contraindicated due to risk factor	49	27.6%	7	28.0%	56	27.7%
Dose too high	1	0.5%	0	0.0%	1	0.4%
Non compliance	0	0.0%	0	0.0%	0	0.0%
Economical reasons	4	7.9%	9	36.0%	23	11.3%

DISCUSSION:

Chronic Kidney Disease patients are always at high risk for drug therapy problems as they are prescribed multiple drugs to counter the co-morbidities and achieve the desired out comes. As the number of drugs increases, the risk of DRPs also increases. In this study the patients were diagnosed with end stage renal disease with a mean age of 42±15 years. Another study which also conducted on DRPS in CKD patients had reported the patients' age range 41-60 out of which 37% male and 40% female showed that CKD was most prevalent in the elderly patients[10]. Another study which was conducted by Stevens and colleagues also reported that the CKD was a considerable high in the elderly population [12] and the results are in line to what is reported by our study.

In the current study, the patients were prescribed with average of 5 drugs per prescription the study was aimed to find out the DRPS per prescription and a total 501 DRPS were found in 202 patients with the average of 2.3 DRPS per prescription. Another study which was conducted by Vanith et al[10] has shown that the average of prescribed drugs per prescription was 8.93 ± 3.26 and the total number of 183 cases had DRPS with the average of 0.81 ± 0.896 DRPs/prescription. The study also revealed that with the increase of drugs per prescription chances of DRPs per prescription also increase [10]. Marquito and colleagues reported that dialysis patients with increase number of drugs were reported with high risk of DRPs [9]. Similar findings were reported whereby the authors debated that CKD patients on dialysis were given 10-12 drugs and their DRPs were continued in large number [13]. Blix and associates also mentioned that 81% of the patients were recognized with DRPs with the average of 2.1 DRPs per patient [14] and the findings are supported by our study.

In this study, the most common drug related problem which was identified among patients was inappropriate dosage (146, 72.3%) followed by drug interaction (120, 54.4%), contraindication (56, 27.7%) and treatment duplicity (43, 21.2%). Within this context, a study reported that drug-drug interactions were reported in 40.2% of patients [10]. Lopez identified DTPs in inpatients and the need for additional treatment was 34.5% followed by 30.2% of adverse reactions and 25.3% of unnecessary treatment [15]. Medication dosing problems (33.5%) and adverse drug reactions (20.7%) were the most common drug related problems by another study [16]. Another study which was also carried out on CKD Patients for DRPs \, 142 DRPs were found and 93% of patients were mainly concerned with untreated indications (31.7%) followed by incorrect dosages[17] which is also supported by our study results.

CONCLUSION:

Overall 501 drug related problems were identified with the average of 2.4 problems per prescription. Drug therapy problems found per prescription were quite high that needs urgent attention. Healthcare professionals must give thorough attention and care before prescribing medications to terminally ill patients. Within this context, the role of clinical pharmacist should be highlighted to identify, resolve and prevent drug therapy problems especially in such critical area of care. Clinical pharmacists have a substantial effect in a wide variety of roles in inpatient and ambulatory settings, largely through optimization of drug use, avoidance of adverse drug events, and transitional care activities focusing on medication reconciliation and patient education.

Limitation

Our study is limited to a single setting and the results are not generalizable. A large study is recommended to get a clear picture of DRPs among patents attending healthcare institutes in Pakistan. Additionally, the current study revealed that no dosage calculation was used and the weight was not mentioned in the record.

Disclosure

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