

Survey-Analysis

**EVALUATION OF RATIONAL DRUG PRESCRIPTION IN RENAL IMPAIRED PATIENTS IN MULTAN, PAKISTAN.****Sana Kunwal, A Subhan Ijaz, M Shahzad Aslam*, Bashir A. Choudhary****Department of Pharmacy, Bahauddin Zakariya University, Multan, Pakistan**

Submitted on: 13.07.2014

Revised On: 25.07.2014

Accepted on: 05.08.2014

ABSTRACT:

The intervention of the pharmacist in the therapy of patients with renal failure can contribute to improve safety, reducing the potential for kidney damage. To determine whether appropriate dosage adjustments are made in patients with significant renal impairment for drugs with a high fractional renal clearance. Evaluation of the Pharmacy Department recommendations about drug dose adjustment in patients with serum creatinine greater than 1.2 mg / dl. We reviewed 76 prescriptions. Glomerular filtration rate creatinine clearance (CrCl) was calculated for patients with serum creatinine greater than 1.2 mg / dL, using the cockcroft-gault formula. We conducted dose adjustment if the creatinine clearance was less than 50 ml / min. During the study, we observed through 76 creatinine values in which 37 patients (48.68%) were having CrCl less than 50ml/min, out of which 18 patients (48.64%) were in requirement of dose adjustment. The number and percentage of patients with each one of the drug evaluated was pyrazinamide 1 patient (5.55%), ceftriaxone 3 patients (16.66%), metoclopramide 4 patients (22.22%), tanzo (piperacilin + tazobactam) 3 patients(16.66%), levofloxacin 1 patient (5.55%), ranitidine 3 patients (16.66) and metformin in 1 patient (5.55%), The mean creatinine clearance (CrCl) observed was 32.62 ml/min. It has also evaluated that 23.68% of patients were in need of dose adjustment. Out of them, the most common drugs prescribed in overdose without dose adjustments were more than 50% were antibiotics. Anti TB, Antiemetic, Hypoglycaemic, H2 blocker were each 11.11% A significant percentage of patients with renal impairment are admitted to hospital on inappropriately high doses of drugs, with a high fractional renal excretion and low therapeutic index.

Keywords: Rational drug prescribing; Renal failure; Creatnine clearance; Serum creatinine**Corresponding Author: Muhammad Shahzad Aslam****E mail:** muhammad.shahzad.aslam@hotmail.comIndian Research Journal of Pharmacy and Science; 2(2014) 46-50;
Journal home page: <https://www.irjps.in>

Introduction

Kidney disease is a common, progressive illness that is becoming a global public health problem. Indeed, the incidence of chronic kidney disease (CKD) is increasing alarmingly in most industrialized countries. For example, the prevalence of CKD among the U.S. adult population was recently estimated to be >13% (>25 million adults) and the number of patients with end-stage renal disease (ESRD) alone has risen from 209,000 in 1991 to 472,000 in 2004 [1]. Pakistan belongs to one of underdeveloped countries with poor health facilities. Pakistan is watching an increase in chronic kidney diseases due to late diagnosis and a growing tendency of high blood pressure and diabetes. In 2002, the National Kidney Foundation developed Kidney Disease Outcome Quality Initiative (K/DOQI) guidelines [2]. This research describes an evaluation of rational drug prescription in renal impaired patients in district Multan, Pakistan.

Material and method:

The retrospective study was conducted in Nishter hospital Multan, Pakistan. Patient with creatinine clearance less than 50ml/min were included to analyse the rational drug prescription. All the patients having serum creatinine above 1.2mg/dL were visited. Patients on dialysis were excluded from the study. Total of 76 prescriptions were reviewed to evaluate the renal function and corresponding dose adjustment. Patients were also interviewed for certain demographics and compliance. Cockcroft-gault equation was used in evaluation of renal function taking serum creatinine as a basic factor [3].

Result:

A total of 37 patients were identified with a mean age of 63.3 years and an estimated mean CrCl of 32.62 mL/min. The number of prescriptions for each of the targeted drugs is shown in Table 1, together with the mean CrCl, mean daily dose and mean maximum appropriate dose. Of a total of 76 prescriptions, 18 (48.68%) were found to have inappropriately high doses and were continued at an inappropriately high dose. (Table 2). For 19 of the prescriptions (51.35%) there was an appropriate dose reduction in hospital. We observed 76 creatinine values in which 37 patients (48.68%) were having CrCl less than

50ml/min, out of which 18 patients (48.64%) were in requirement of dose adjustment. The number and percentage of patients with each one of the drug evaluated was pyrazinamide 1 patient (5.55%), ceftriaxone 3 patients(16.66%), metoclopramide 4 patients (22.22%), tanzo(piperacilin + tazobactam) 3 patients(16.66%), levofloxacin 1 patient (5.55%), ranitidine 3 patients(16.66%), gentamicin , vancomicin and metformin in 1 patient (5.55%).

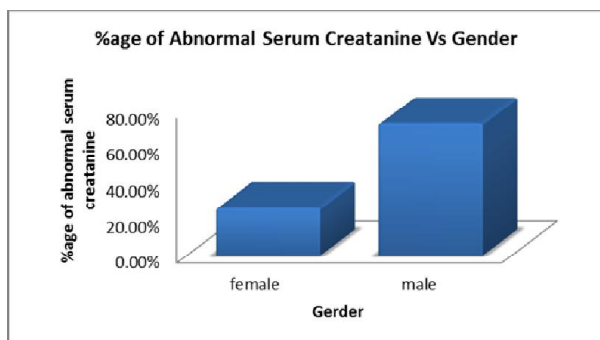
Table 1: Demographic data of patients with renal impairment

Demographics	Number (%)
CrCl, creatinine clearance.	
Patients (n)	76
Male	47 (61.84)
Female	29 (38.15)
Age (mean)	73.3 (21–85)
Estimated CrCl (mean)	32.62
Patients with estimated CrCl (mL/min)	
0–10	1 (3)
11–20	9 (24.32)
21–30	14 (37.83)
31–40	9 (24.32)
41-50	4 (10.81)

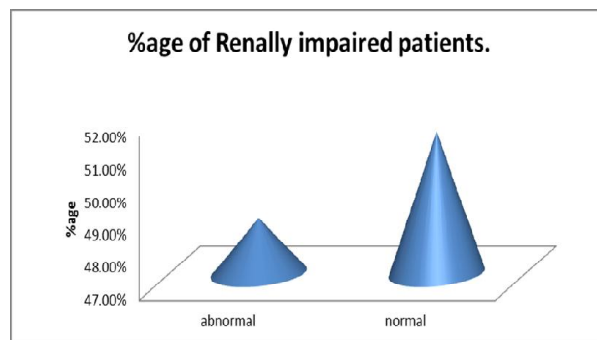
Table 2: Results showing number of prescriptions, with abnormal CrCl, dose given, prescriptions with inappropriately high initial doses and dose reduction in hospital.

Sr#	CrCl mL/min,	Drug name	Dose given	Standard dosage renal protocol	PWDT OK/↑/↓
1	45.9	pyrazinamide	400mgq6h =1600mg/day	20mg/kg/day 20x70=1400mg/day	↑by 200mg
2	39.4	ceftriaxone	1g tds	In renal impairment Not >2g/day	↑ by 1g
3	14.5	metoclopramide	10mg tds	For Crcl 10-40ml/min 50%dose	↑ by 5mg
4	18.4	metoclopramide	10mg tds	For Crcl 10-40ml/min 50%dose	↑ by 5mg
5	39.1	metoclopramide	10mg tds	For Crcl 10-40ml/min 50%dose	↑ by 5mg
6	18.9	Piperacilin+tazobactum	4.5mg tds =13.5g/day	2.25g q8h=6.75g/day	↑ by 7mg
7	36.5	levofloxacin	500mg od	750mg/48hrs or 375mg/24hrs	↑ by 125mg
8	42.0	gentamicin	80mg tds =240mg/day	90mg/12hr= 180mg/day	↑ By 60mg
9	47.4	Ranitidine	50mg iv tds	50mg OD	↑ by 100mg
10	36.5	Ranitidine	50mg iv bd	50mg OD	↑ by 25mg
11	36.6	Ranitidine	50mg/bd =100mg/day	50mg OD	↑ by 50mg
12	39.1	Piperacilin +tazobactum	4.5mg tds =13.5g/day	2.25 q6hr=9g/day	↑By 4g
13	11.9	ceftriaxone	2g bd	Not > 2g/day	↑ By 2g
14	49.1	vancomycin	1g bd	1g OD	↑ by 1g
15	30.9	ceftriaxone	1g tds	1g BD	↑ by 1g
16	40.0	Piperacilin +tazobactum	4.5mg tds =13.5g/day	2.25 q6hr=9g/day	↑By 4g
17	10.1	metoclopramide	10mg tds =30mg	25% of normal dose=7.5mg/day	↑ By 23mg
18	39.1	metformin	500mg od	Contraindicated in crcl<60ml/min	↑

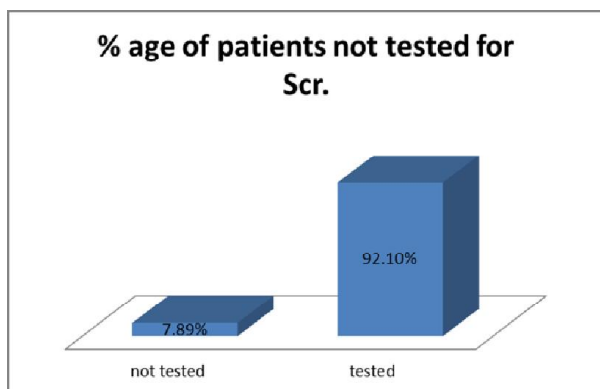
GRAPHICAL REPRESENTATIONS



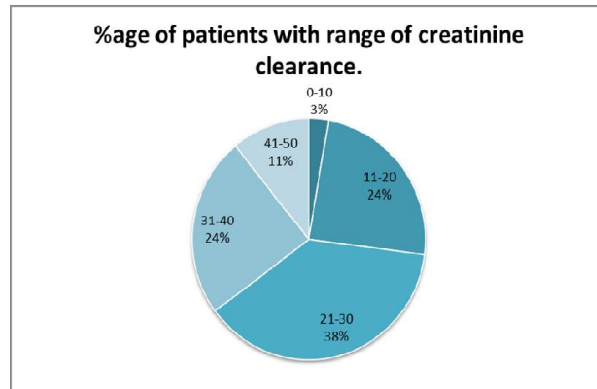
(1)



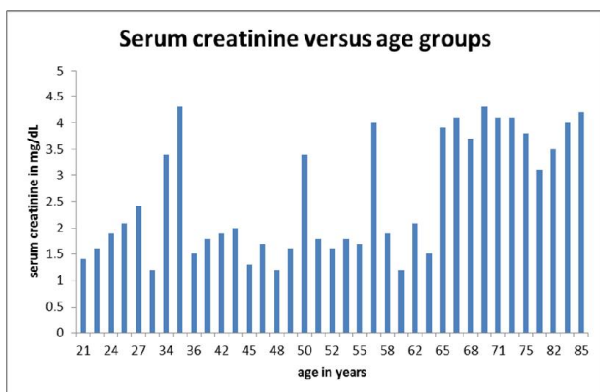
(4)



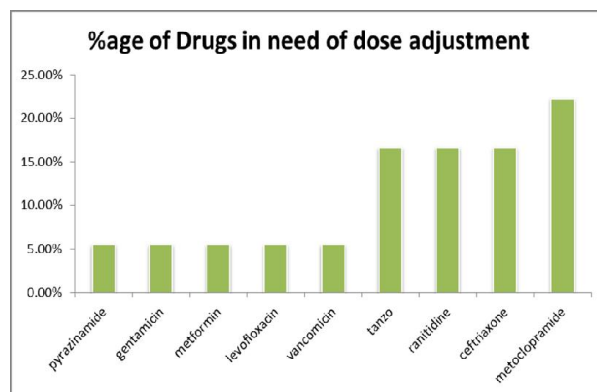
(2)



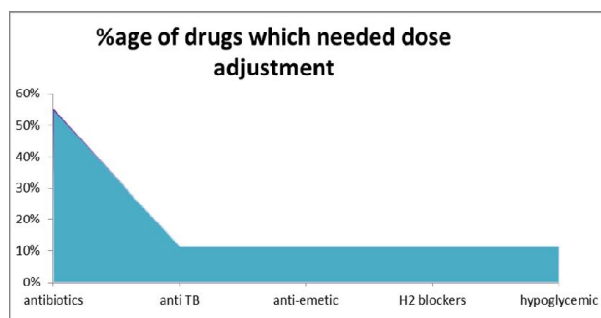
(5)



(3)



(6)



(7)

Discussion:

According to prescription, male has abnormal serum creatinine more than female as shown in graph (1). About 7.80% of patients have not tested for their Serum Creatinine as mentioned in graph (2). We have calculated Serum Creatinine in different age groups and we found that with the increase in age serum creatinine level rises as describe in graph (3). In comparison of management of dose adjustment with rational prescribing standard guidelines 48.68% patients were renally impaired whereas 51.35% were rationally prescribed according to standard renal protocols as shown in graph (4). It has also evaluated that 23.68% of patients were in need of dose adjustment and dose adjustment with regard to individualization of renal impairment. Out of 23.68%, the most common drugs prescribed in overdose without dose adjustments were more than 50% were antibiotics. Anti TB, Antiemetic, Hypoglycaemic, H2 blocker were each 11.11% according to graph (6) and (7).

Conclusion:

A significant percentage of patients with renal impairment are admitted to hospital on inappropriately high doses of drugs, with a high fractional renal excretion and low therapeutic index. Pharmaceutical intervention had improved pharmacotherapy of patients with acute renal failure. There are 23.68% prescriptions contained a medication overdose considered as potentially lethal or severe. With regard to these results, the quality of drug prescription in patients with renal impairment is an important field for quality improvement and which provokes a healthy participation of pharmacist in individualization of dose to each patient with respect to renal function.

REFERENCES

- [1] Josef. Coresh., Elizabeth. S., Lesley. A., Stevens. J., Manzi. J. W., Kusek. Paul., Eggers. Frederick., Van. Lente., Andrew. S. Levey., Prevalence of Chronic Kidney Disease in the United States. The Journal of the American Medical Association. 2007, 298: 2038–2047.
- [2] National Kidney Foundation. K/ DOQI clinical practice guidelines for chronic kidney disease: evaluation, classification and stratification. American Journal of Kidney Diseases, 2002, 39 (2 Suppl 1): S1-266.
- [3] Verbeeck. R.K., Musuamba. F.T., Pharmacokinetics and dosage adjustment in patients with renal dysfunction, Eur J Clin Pharmacol 2009; 65: 757–773.

Conflict of Interest Reported: Nil; Source of Funding: None Reported

