

Original Article

**STUDY ON DRUG UTILIZATION PATTERN OF CHRONIC RENAL FAILURE PATIENTS IN A TERTIARY CARE HOSPITAL**

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**ABSTRACT**

**Objective:** Chronic Renal Failure is a worldwide public health problem with an increasing incidence and prevalence, poor outcomes and high cost of treatment due to co-morbidities and Polypharmacy. The aim of this study was to describe drug utilization pattern of patients with chronic renal failure in a tertiary care hospital.

**Methods:** The study was conducted between July -2013 to December-2013. In total 150 patients were identified and 135 patients were recruited for further study. Study subject medical record and prescription was reviewed on their regular hospital visit. Those were missed the followup, their medical records and prescription were reviewed from the medical record department

**Results:** In this study, male subjects (62.85 %) predominated; 37.05% of the patients were in the age group of 51 to 60 years. The mean age of subjects was 53.26 ±15.69 years. The average number of drugs prescribed per prescription was 5.26 ± 3.79.

**Conclusion:** The prevalence of Polypharmacy was high in patients with CRF. Diuretics, anti hypertensive and anti diabetic drugs were used more frequently in chronic renal failure patients. Moreover time to time studies are required to improve management strategy and quality of life of patients.

**Keywords:** Prescribing pattern, Chronic Renal Failure, Polypharmacy.

**INTRODUCTION**

Chronic Renal Failure (CRF) is a worldwide public health problem with an increasing incidence and prevalence, poor outcomes and high cost of treatment due to co-morbidities and Polypharmacy[1,2]. The increasing importance, of drug utilization studies as a valuable investigation resource in pharmacoepidemiology. It has been bridging it with other health related areas, such as pharmacovigilance and pharmacoeconomics [3]. Drug utilization studies may use to evaluate the drug use at a population level, according to demographic, morbidity and other characteristics. These studies are useful to monitor the pattern of drugs from particular therapeutic categories where the problems can be anticipated [4, 5, 6]. As compared with pre marketing clinical trials, post marketing studies are helpful to improve the therapeutic strategy and to monitor the incidence of adverse drug reactions and Drug interactions [7]. The cost of treatment in CRF was increased due to co-morbidities and use of number of drugs for same condition. Inappropriate use of drugs may increase the change of adverse drug reactions and reduce the quality of life of patients. To describe these issues, the study was planned to assess drug utilization pattern of patients with Chronic Renal Failure in a tertiary care hospital.

**MATERIALS AND METHODS**

The study was carried out in the department of nephrology, PSG Hospital. The study was approved by Institutional Human Ethics Committee. After obtained informed consent, the adult male and female patients were recruited to the study. Children, pregnant, breast feeding women and patient on haemodialysis were excluded from the study. During the study period, patients were interviewed and their medical records were reviewed to assess the drug utilization pattern.

**Study population**

The study was conducted between July -2013 to December-2013. In total 150 patients were identified and 135 patients were recruited for further study. Study subject medical record and prescription were reviewed on their regular hospital visit to the nephrology

department of PSG Hospitals, Coimbatore. Those were missed the follow-up, their medical records and prescription were reviewed from the medical record department.

**Statistical analysis**

Documented Data was analyzed by using Graphpad prism version 4.0. Results were expressed as Mean ± Standard Deviation (SD). Non parametric values were expressed as the percentage.

**RESULTS**

In total, 150 Chronic Renal Failure patients were identified during the study period of six months. Of this, 135 patients were included for the study as per the inclusion and exclusion criteria (n=135). The patient's medical record and prescription were reviewed to describe the drug utilization pattern.

**Demographics**

Out of 135 patients studied, 72 were male and 63 were female (Table-1). As per the study result, the percentage of male patients (62.85%) was greater than the percentage of female patients (37.14 %).

**Table 1: Gender distribution**

Sex	No. of Patient	Percentage (%)
Male	72	53.33
Female	63	46.66

More number, of patients with in the age group of 51 to 60 years (16, 45.71 %). (Table -2) the mean age was 53.26 ±15.69. The male and female subjects with the age group of 51-60 years were the highest in number by 26 (36.11 %) and 24 (38.09 %) respectively.

**Co-morbidity assessment**

The most frequently encountered co-morbidities were related to cardio vascular system. The more number of patients had hypertension, diabetes and anaemia as co-morbidities.

In total 135 subjects 112 (82.96 %) with hypertension and 98 patients with (72.59 %) diabetes were reported during the study period. (Table-3).

**Table 2: Age distribution**

Age	Male	Female	Total	Percentage (%)
20-40 Yrs	8	4	12	8.89
41-50 yrs	14	13	27	20.01
51-60 Yrs	26	24	50	37.03
61-70 Yrs	17	20	37	27.41
>70 Yrs	7	2	09	6.67
Mean Age	53.26 ±15.69*			

\*Mean ± Standard Deviation, Yrs – Years

**Polypharmacy**

A total of 135 prescriptions were reviewed, 116 prescriptions had more than five drugs (85.92 %). The prevalence of Polypharmacy was high in CRF patients. The average number of drugs prescribed per prescription was 5.26 ± 3.79. (Table-4)

**Drug utilization pattern**

The study results showed that cardiovascular drugs, particularly anti hypertensive agents were prescribed more than other drugs. Calcium channel blockers were used frequently with the combination of Beta blockers and angiotensin-II receptor blocker. Anti -coagulant of Aspirin with Clopidogrel was prescribed for 28 patients (20.74 %). In dyslipidaemia, atorvasatin was prescribed for 56 patients (41.48 %). (Table-5).

**DISCUSSION**

The CRF population is on the rise worldwide due to increased incidence of diabetes and cardiovascular diseases. In other hand, inappropriate use of drugs and poly pharmacy make these populations vulnerable to drug induced kidney diseases [14]. In

India, limited data are available on drug utilization in CRF population.

In this study, male subjects (62.85 %) predominated; 37.05% of the patients were in the age group of 51 to 60 years. The mean age of subjects was 53.26 ±15.69 years. The majority of these subjects had family history of cardio vascular diseases. The morbidity pattern in these subjects was quite similar to what is commonly found CRF patients in India. The common morbidities included cardiovascular conditions like Systemic Hypertension, Diabetes mellitus and disorders of the neurological Diseases. In an earlier study the remarkable feature of psychiatric conditions were noted from western countries in the geriatric patients [8].

The negligible prevalence of mental health problem in our study could be due to improved awareness regarding CRF among patients and family members. The Average number of drugs prescribed per prescription is an essential index to measure the degree of polypharmacy [9]. Also, it provides scope for systemic review and educational intervention in prescribing practices [13]. In this study the mean number of drugs per prescription was 5.26 ± 3.79, which could be due to prevalence of co-morbidities. It demonstrated that the polypharmacy or over prescribing of drugs in CRF patients may lead to risk of adverse drug reaction and drug interaction. Other hospital-based studies have reported higher value [10].

Anaemia and dyslipidemia were fairly prevalent in the study population of CRF patients other than hypertension and diabetes mellitus. Patients with diabetes were mostly having associated dyslipidemia. They were treated with Glimipride (45.93%) or in combination with metformin. Most of the CRF patients with hypertension were treated with metoprolol and amlodipine or both. In this study, the average number of drugs used in CRF patients for mo-morbidities were same like other studies reported [11, 12]. Ferrus fumarate (41.48%) and folic acid (44.48%) were used frequently to treat anaemia. In this study of polypharmacy prevalence rate was high, it could be due to inclusion of proton pump inhibitor pantaprazole (82.96%) and multi vitamin (49.63%) preparations.

**Table 3: Co-morbidity assessment**

Co-morbidity	Male	Female	Total	Percentage (%)
Hypertension	70	42	112	82.96
Diabetes	64	34	98	72.59
Anaemia	58	62	120	88.89
Dyslipidaemia	30	26	56	41.48
Ocular disease	11	13	25	18.51
Neurological Disease	18	21	39	28.89
ENT Disease	05	11	16	11.85

**Table 4: Polypharmacy Assessment**

No. of Drugs Prescribed	Male	Female	Total	Percentage (%)
Less than 5 Drugs	11	8	19	14.07
More than 5 Drugs	61	55	116	85.92
Avg. No of Drugs/ Prescription	5.26 ± 3.79*			

\*Mean ± Standard

**Table 5: Drug utilization pattern in CRF patients**

Name of the Drugs	No. of patient	Percentage (%)
<b>Beta Blocker</b>		
Metoprolol	28	20.74
Atenolol	24	17.78
<b>Calcium Channel Blocker</b>		
Amlodipine	15	11.11
Felodipine	7	5.19
<b>Angiotensin - II Receptor Antagonists</b>		
Losarton	32	23.70
Telmisartan	42	31.11
<b>Anti-coagulant drug</b>		

Aspirin + Clopidogrel	28	20.74
<b>α1- Receptor Antagonist</b>		
Prazosin	8	5.93
Alfuzosin	5	3.70
<b>HMG-CoA Reductase Inhibitor</b>		
Atorvastatin	56	41.48
<b>Anti Diabetics</b>		
Metformin	36	26.67
Glyclazide	12	8.89
Glimipride	62	45.93
<b>Steroids</b>		
Prednisolone	16	11.85
<b>Anaemic Drug</b>		
Folic acid	60	44.44
Ferrus fumerate	56	41.48
<b>Vitamin and Mineral</b>		
Calcium carbonate and vitamin D3	4	2.96
Vitamin B. Complex	22	16.30
Mecobalamin +Alpha Lipoic Acid	67	49.63
<b>Diuretics</b>		
Spironolactone+Hydroflumethazide	56	41.48
Furosemide	72	53.33
Torseamide	26	19.26
<b>Proton Pump Inhibitor</b>		
Pantaprazole	37	27.41
<b>Others</b>		
Sodium Bicarbonate	112	82.96
	126	93.33

Furosemide (19.26%) and spironolactone+Hydroflumethazide (53.33 %) were prescribed for diuretic therapy in CRF patients. Co-morbidity of anaemia was treated with folic acid (44.44%) and ferrus fumarate (41.48 %). Proton Pump Inhibitor (PPI) and Vitamin B-complex containing preparations were prescribed with the high prevalence of 82.96% and 49.63% respectively.

## CONCLUSION

In the present study, the prevalence of Polypharmacy was high in patients with CRF. Diuretics, anti hypertensive and anti diabetic drugs were used more frequently in chronic renal failure patient because of the high prevalence of co-morbidities. The value of indiscriminate use of anticoagulants and vitamins is valuable addition to the effective medications for secondary prevention of high risk patients. Moreover time to time studies is required in drug utilization pattern to improve management strategy and quality of life of patients. However, targeted education of the prescribers and dissemination of treatment guideline could facilitate rational use of drugs and adherence to treatment guidelines.

## CONFLICT OF INTERESTS

The authors have no funding sources or conflict of interests to report.

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