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ASSESSMENT OF THE PRESCRIPTION PATTERN OF DRUGS USED IN CHRONIC KIDNEY DISEASE PATIENTS UNDERGOING HAEMODIALYSIS IN A TERTIARY CARE HOSPITAL

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ABSTRACT

BACKGROOUND: Chronic Kidney Disease (CKD) has emerged as a major public health hazard worldwide accounting for 98.02% increase in death over the last 27 years. All stages of CKD are associated with increased risks of cardiovascular morbidity, premature mortality, and/or decreased quality of life. The prevalence of CKD increases with age and will continue to rise, reflecting the growing elderly population. As the prevalence of CKD increases they are at a higher risk for progression into End Stage Renal Disease (ESRD) requiring dialysis to maintain the patients' long term survival[1]. The availability and affordability of good quality medicines along with their rational use is crucial for effective management of any disease [2]. This study can illustrate the present scenario of CKD patients in a tertiary care hospital and the prescribing trends of physicians in managing these patients with comorbities and complications. It provides an outline for management strategies and will be influential in health care decision making.The objective of this study was to assess the prescription pattern of drugs used in chronic kidney disease patients undergoing haemodialysis in a tertiary care hospital in India. METHODOLOGY: This was a prospective observational study carried out with 135 chronic kidney disease patients undergoing haemodialysis in the Nephrology department of Muthoot Healthcare Pvt Ltd, Kozhencherry, for a period of 6 months .RESULTS : In our study, it was found that antihypertensives were most commonly prescribed class of drugs (16%) followed by other drugs. A total of 135 patients were included in this study in which 73% were males and 27% were females. Out of total prescribed drugs (1856), the most commonly prescribed were antihypertensive agents (16%), multivitamins (13%), hematinics (11%), diuretics (7.4%), erythropoietin stimulating agents (7.2%).

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INTRODUCTION

Chronic diseases have become a major cause of global morbidity and mortality even in developing countries. It is a worldwide public health problem and causes a huge burden both to the affected patients and health-care providers[3]. CKD is the 9th most probable cause of death as per 2016 statistics[4].

Drugs play an important role in the healthcare delivery system. The availability and affordability of good quality medicines along with their rational use is crucial for effective management of disease[5,6]. Drug utilization studies are conducted frequently all over the world. In developing countries with constraints of health budget for drugs, it becomes even more meaningful to prescribe drugs rationally[7]. Rational drug use is defined as the use of an appropriate, efficacious, safe and cost effective drug given for the right indication in the right dose and formulation, at right intervals and for the right duration of time. However, irrational drug use is more common nowadays especially in developing countries due to irrational prescribing, dispensing and administration of medication[8]. Study of prescribing pattern can identify the factors responsible for poly pharmacy and the problems associated with it. It is also an important tool to determine the rational drug therapy and maximize utilization of resources[9].

Poly-pharmacy is a major challenge in the treatment of chronic medical disorders because in chronic diseases like CKD, use of more than 5 or more drugs at a time is an unavoidable predicament faced due to the prevalence of co-existing illnesses[10,11].

Therefore pharmacotherapy of CKD is complex and inevitably requires polypharmacy with frequent monitoring of drugs and their dosage adjustments. Further, treatment of concurrent diseases like diabetes mellitus, hypertension, coronary artery diseases and infections add to the complexity.

Patients of CKD therefore, face several drug related problems like drug interactions, medication dosing errors, high incidence of adverse drug events which result in an increase in morbidity and mortality, as well as an increase in the cost of health care. Such patients are therefore, non-compliant to the treatment which is a hindrance to successful treatment outcome. Insight into the prescribing trends can help to identify, evaluate and minimize prescription errors and thereby decrease the burden of the disease [12]. Drug utilization changes with time period, physician, disease conditions and population, which makes it is important to study the drug utilization continuously over a period of time[13].

CKD patients need to take medicines lifelong, which makes it is very important to study the prescribing trend on a regular basis. There is very limited evidence from India on the prescribing trends in CKD patients. Drug utilization studies in CKD patients help to understand and build evidence for the drug use[12]. The study of prescribing patterns is a component of medical audit that monitors and evaluates prescribing practices, and recommends necessary modifications to achieve rational drug use. It provides a framework for continuous prescription audit in a hospital setting and suggests possible improvement in prescription practices in patients suffering from CKD [14].

Medical care for CKD patients is complex, due to widespread co-morbidities and major risk factors for CKD. The progression of CKD and the deterioration of kidney function can be slowed by optimal treatment of underlying co-morbidities and risk factors, which can be accomplished with lifestyle modifications and/or different pharmacological interventions. CKD patients receive nearly 10 to 12 medications daily, many of which require multiple doses every day and due to this, frequent medication adjustments are required. Prescribing pattern studies can provide useful information for the improvement of appropriate and effective use of drugs in a hospital. This will have an enormous impact on patient's quality of life and contribute substantially to the financial cost of patient care [12].

This study can illustrate the present scenario of CKD patients in a tertiary care hospital and the prescribing trends of physicians in managing these patients with comorbities and complications. It provides an outline for management strategies and will be influential in health care decision making. These studies can increase our understanding of how drugs are being used. It can estimate the number of patients exposed to specified time period, describe the extent of drug use at a certain moment and/or in a certain area[7].

Different classes of drugs are being prescribed for the patients for various comorbidites and complications. Their doses, route of administration are adjusted according to their individual needs. The drugs given to the patients include: anti hypertensives, antiplatelets, cardiac drugs haematinics, antipruritic, multivitamins, potassium binders, phospate binders, erythropoietin stimulating agents, diuretics, antacids, hypolipidemics, hypoglycemics, thyroid medication, hyperparathyroid medications, antimicrobials, alkalizing agents, drugs for benign prostatic hypertrophy, antiepileptics, drugs for hyperuricemia.

OBJECTIVE

Assessment of prescription pattern of drugs used in chronic kidney disease patients undergoing haemodialysis in a tertiary care hospital in India.

MATERIALS AND METHOD

This is a prospective observational study conducted for a period of 6 months in the nephrology department of Muthoot Healthcare Hospital Pvt Ltd, Kozhencherry, Kerala, India after obtaining the approval from the Institutional Ethics Committee of the hospital. A sample size of 135 patients of genders diagnosed to have chronic kidney disease undergoing haemodialysis in the Nephrology unit between the age of 20 to 80 years were included. Pregnant population and those not willing to participate were excluded from the study.All subjects were provided with a brief introduction regarding the study and the confidentiality of the data. A written Informed Consent printed in their understandable language was obtained from the patient or care-giver, if the subject was unable to give the same. Relevant information was collected according to the approved pre-designed data collection form. Data of each subject was individually screened to assess the prescription pattern. Data was then statistically analyzed in Microsoft excel -2010 version and results were analyzed as tabular form and percentages.

RESULTS

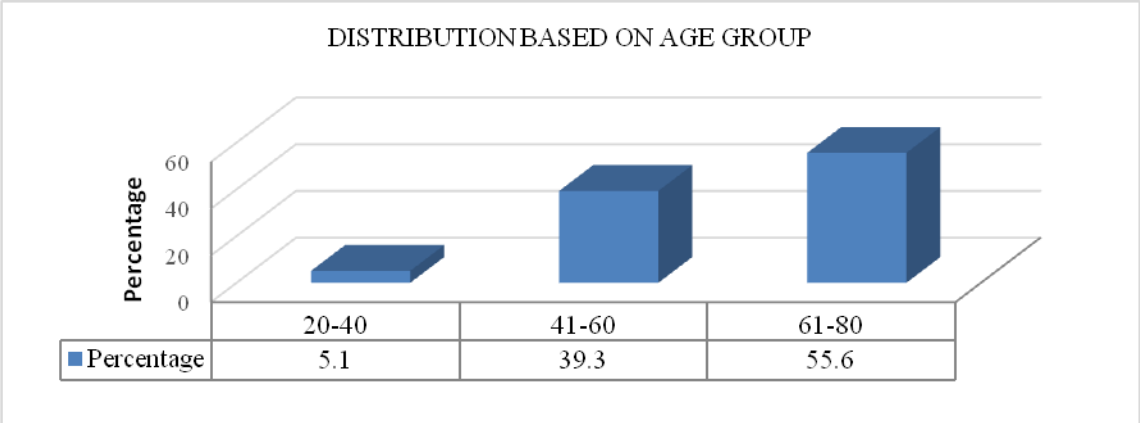

FIGURE 1: DISTRIBUTION OF PATIENTS BASED ON AGE GROUP.

In this study, the highest percentage of haemodialysis patients were found to be in the age group of 61-80 (55.6%) followed by the age groups 41-60 (39.3%), and 20-40 (5.1%).

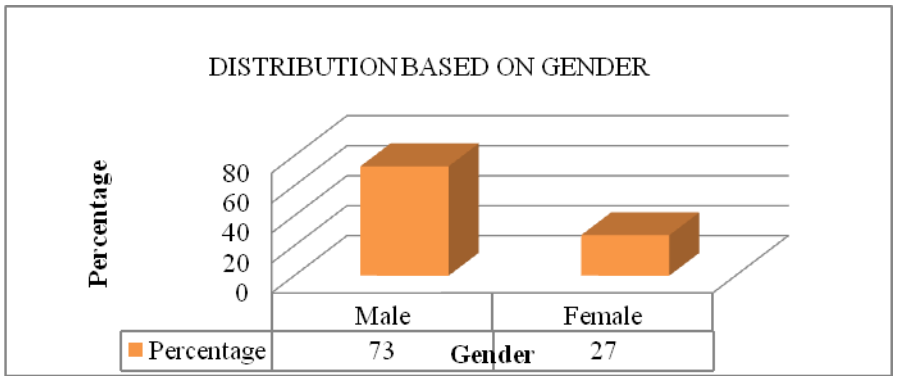

FIGURE 2: DISTRIBUTION OF PATIENTS BASED ON GENDER.

In this study, 73% of the study population was constituted by males whereas 27% was constituted by females.

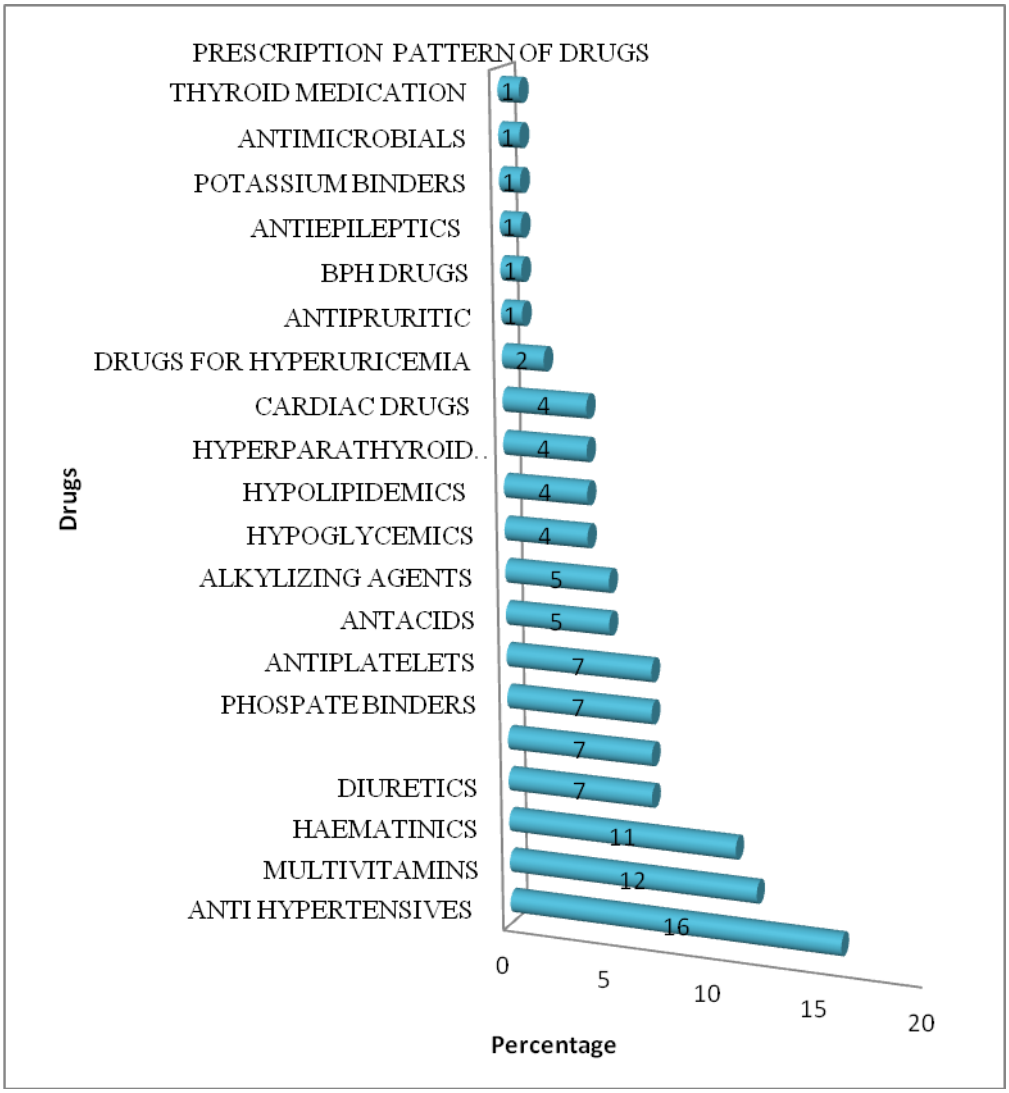

FIGURE 3: ASSESSMENT OF PRESCRIPTION PATTERN OF DRUGS USED IN CKD PATIENTS.

The most prescribed drug in this study was the antihypertensive drugs with a total of 16% followed by multivitamins 12% and haematinics 11%.

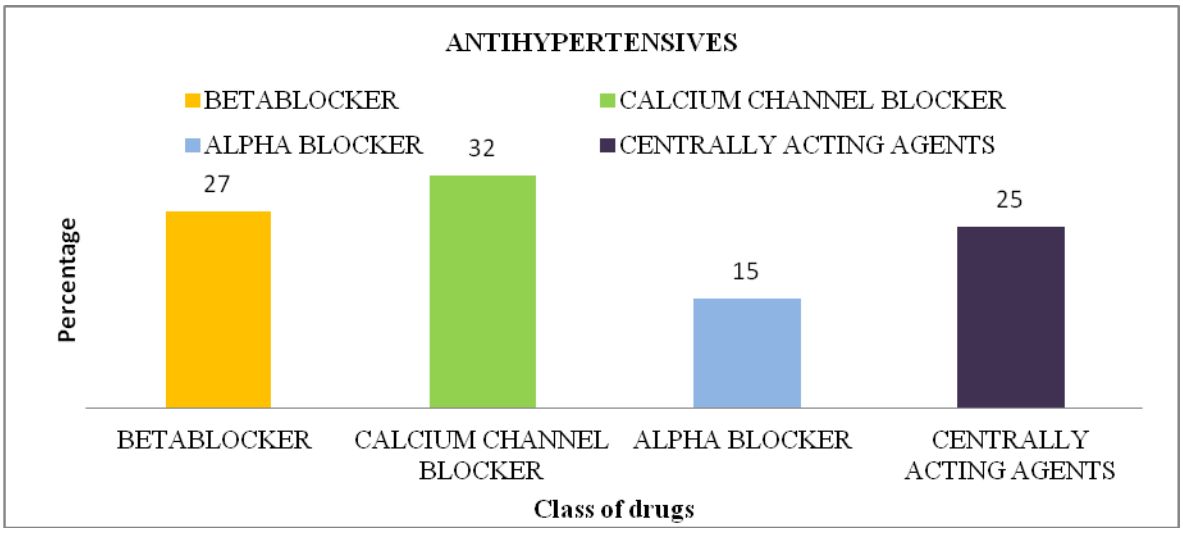

FIGURE 4: DISTRIBUTION OF ANTIHYPERTENSIVES IN THE STUDY POPULATION.

The most prescribed drug in this study was calcium channel blocker 32% followed by beta blockers 27%.

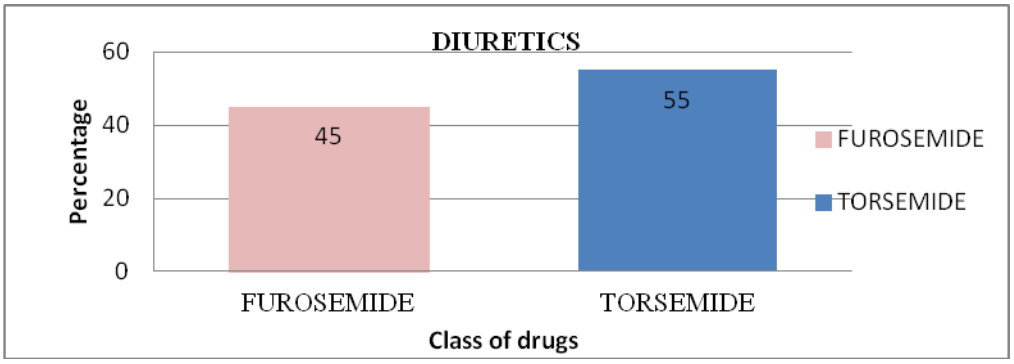

FIGURE 5: DISTRIBUTION OF DIURETICS IN THE STUDY POPULATION.

In this study the most commonly prescribed diuretic is torsemide (55%) followed by furosemide (45%).

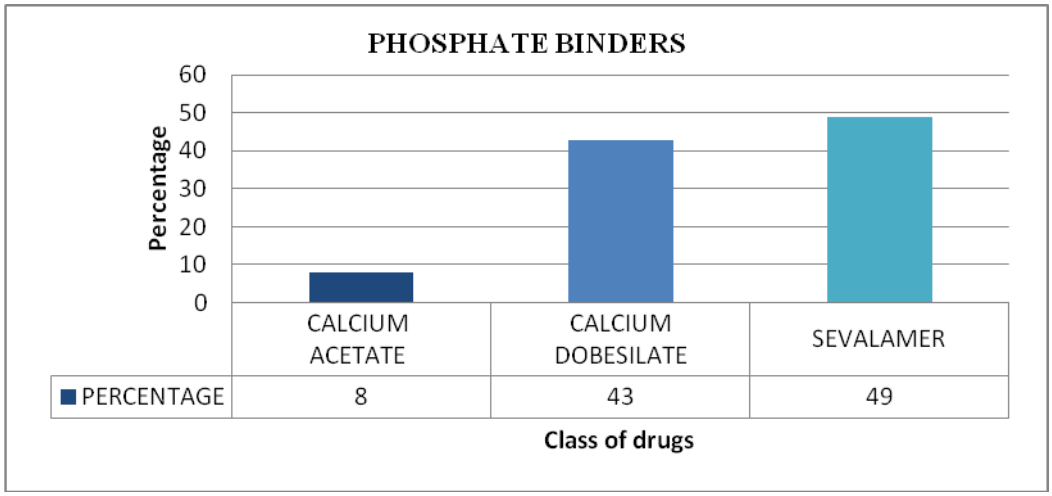

FIGURE 6 : DISTRIBUTION OF PHOSPHATE BINDERS IN THE STUDY POPULATION.

In this study the most commonly prescribed phosphate binder was sevelamer (49%) followed by calcium dobesilate (43%) and calcium acetate (8%).

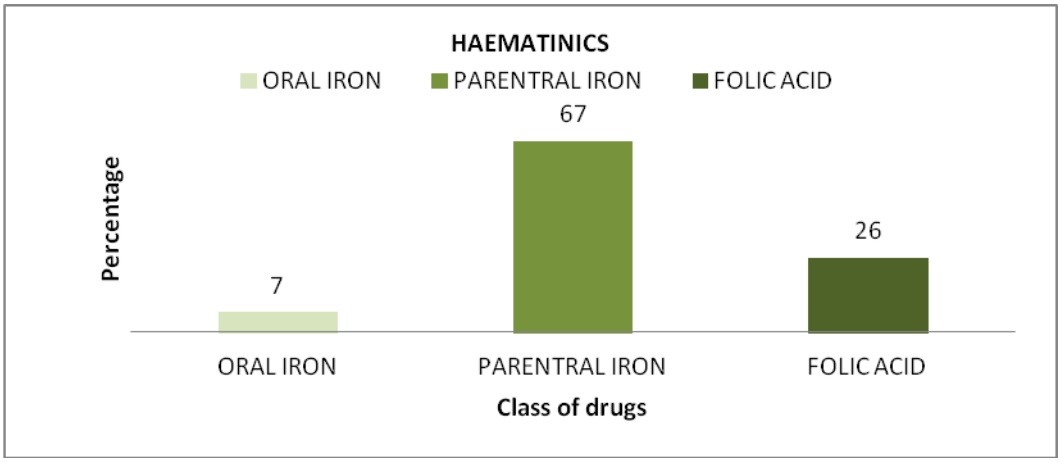

FIGURE 7: DISTRIBUTION OF HAEMATINICS IN THE STUDY POPULATION.

In this study the most commonly prescribed haematinics were parenteral iron (67%) followed by folic acid (26%) and oral iron (7%).

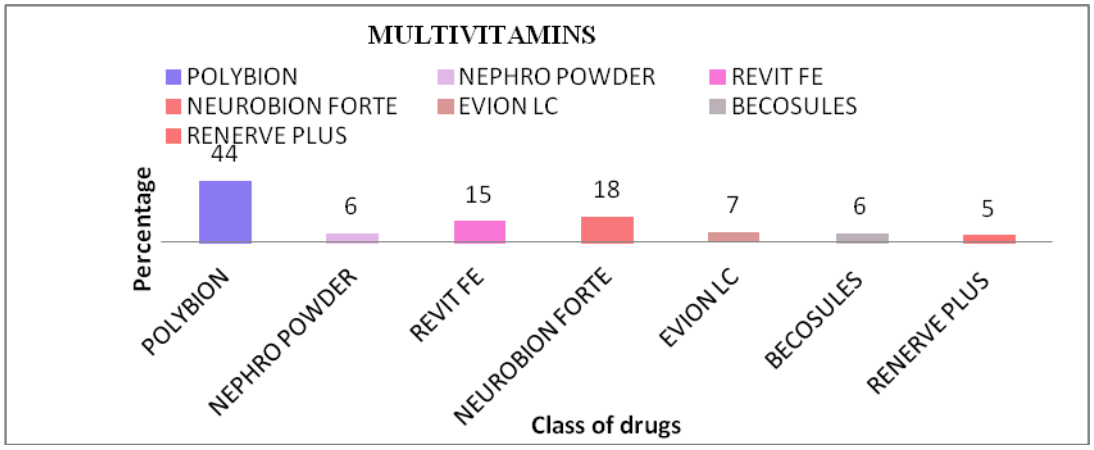

FIGURE 8: DISTRIBUTION OF MULTIVITAMINS IN THE STUDY POPULATION.

In this study the commonly prescribed multivitamin were Polybion (44%) followed by Neurobion Forte (18%), Revit Fe (15%), Evion LC (7%), Becosules (6%), Renerve Plus (5%).

DISCUSSION

The study was conducted with the objective of determining the prescription pattern of drugs in CKD patients undergoing haemodialysis.

A total of 1856 drugs which included 20 different classes of drugs were prescribed to 135 haemodialysis patients and antihypertensives (16%) were found to be the most commonly prescribed class of drugs which can be easily explained by the finding that hypertension is found to be the most common comorbidity in these patients. Other frequently prescribed classes of drugs include multivitamins (12%), hematinics (11%), diuretics (7.4%), erythropoietin stimulating agents (7.27%), phosphate binders (6.73%), antiplatelet agents (6.51%), antacids (5.71%), hypoglycemics (4.31%), alkalizing agents (4.57%), hyperparathyroid medications (4.09%), hypolipidemics (3.87%), cardiac drugs (3.66%), hyperuricemic agents (2.26%), BPH drugs (1.07%), thyroid medications(1.02%), antiepileptics (0.97%), potassium binders (0.53%), antimicrobials (0.48%) and antipruritic agents (0.1%). These observations are supported by those of similar studies evaluating the prescription pattern of drugs in hemodialysis patients.

In the study conducted by Yoshiyuki Morishita *et al.,* [15] (2014) their results showed that antihypertensives were highly prescribed for CKD patients. In our study too antihypertensives were mostly prescribed. In the study by Soumya Santra *et al.,* [10] (2015) they reported that five most commonly used drugs were diuretics (mostly loop diuretics), antihypertensives (like calcium channel blockers, β-blockers), anti-ulcer agents, mineral supplements including calcium and hematinics.

In our study most commonly prescribed antihypertensive drug was found to be calcium channel blockers (32%), followed by beta blockers (27%), centrally acting agents (25%) and alpha blockers (15%). In the study by Bhanu Priya *et al.,* [12] (2015) the most commonly prescribed antihypertensives, was calcium channel blockers (39.5%) followed by centrally acting drugs (10.2%), β blockers (9.7%), alpha blocker (7.9%).

In our study most of the diabetic patients were on insulin therapy 4.3%. In the study by Sourav Chakraborty *et al.,* [16] (2016) they reported that insulin (2.73%) was commonly prescribed. In the study by Chaitali S Bajait *et al.,* [14] (2014) most of the patients were on insulin therapy (1.14%). In the study by Bhanu Priya *et al.*[,12] (2015) they reported that diabetic patients were mostly on insulin therapy.

In the study by Ansuman Abhisek *et al.,* [17] (2017) among diuretics, loop diuretics were commonly given and in this torsemide was commonly prescribed (32%) followed by furosemide. In our study too, loop diuretics were commonly given, torsemide (56.3%) was found to be commonly prescribed followed by furosemide (45.92%), as torsemide has longer duration of action than furosemide and does not accumulate in renal failure.

In the study by Chaitali S Bajait *et al.,* [14] (2014) results shows multivitamins to be more commonly prescribed drug than hematinics like iron and folic acid. In our study too, we observed that multivitamins (12%) as one of the commonly prescribed drug than hematinics (11%).

In the study by Narayana Murthy and Satyanarayana[18] (2014) anaemia is the most common complication seen among these patients due to reduced erythropoietin secretion. In their study also 36% patients had anaemia and were treated with hematinic and vitamin supplements. As hematinic, iron supplements 15% (like livogen, folic acid, iron sucrose) and multivitamins in 11%, were prescribed, erythropoietin stimulating agents(15%). In our study too anaemia (31.3%) is the most common complication seen and is treated with hematinics (11%), and multivitamins (12%), erythropoietin stimulating agents (7.2%).

In our study among phosphate binders, sevalamer (50.41%) was found to be most commonly prescribed followed by calcium dobesilate (44.62%) and calcium acetate (8.26%). These findings, however contradicted with those of by Chaitali S Bajait *et al.*, [14] (2014) that finds calcium carbonate as the most commonly prescribed drug and sevalamer as the least prescribed phosphate binder attributed to its relatively higher cost. *Other relevant studies also show calcium carbonate to be the more commonly prescribed phosphate binder than sevalamer.* The greater usage of sevalamer, in the present study, can be attributed to its better safety profile as compared to calcium containing phosphate binders. Though calcium salts are inexpensive, they are associated with increased risk of metastatic calcification. Sevelamer, besides its effect on phosphate, has been associated with reduction of coronary and aortic calcification. Sevelamer is an ion exchange resin, non absorbable, and the first phosphate binder that is not a source of aluminium or calcium[19].

CONCLUSION

The study was conducted prospectively by using a sample size of 135 patients with the aim of assessing the prescription pattern of drugs used in chronic kidney disease patients undergoing haemodialysis in nephrology department for a study period of 6 months. The obtained parameters were analysed and the results concluded that the most prescribed drug in the study population was antihypertensives (16%) which was followed by multivitamis (13%), haematinics (11%), diuretics (7.4%), erythropoietin stimulating agents (7.2%) and phosphate binders (6.7%). The study has helped to provide an overall estimate of the drugs being prescribed among the CKD patients in the concerned tertiary care hospital. Incorporating a standard assessment and treatment may reduce the complications and adverse reactions seen in these patients and would help doctors, medical professionals and family members to better understand the physical and psychological problems of patients with CKD on haemodilaysis. This would in turn improve their quality of life and reduce the mortality risk in this population.

AREAS OF CONFLICT

NIL

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