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A STUDY ON PRESCRIPTION PATTERN OF CHRONIC KIDNEYDISEASE IN TERTIARY CARE HOSPITAL

M. Saraswathi Pravallika*, H. Sampreethi, CH. Anusha, K. Rohini and Dr. Shivkumar Shete

Doctor of Pharmacy, Sree Dattha Institute of Pharmacy, Jawaharlal Nehru Technological University, Hyderabad, Telangana, India.

***Corresponding Author: M. Saraswathi Pravallika**

Doctor of Pharmacy, Sree Dattha Institute of Pharmacy, Jawaharlal Nehru Technological University, Hyderabad, Telangana, India.

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ABSTRACT

Aim: The aim of the present investigation is to study the prescription pattern of chronic kidney disease in tertiary care hospital. **Objective**: The objective of the study was to study the prescription patterns of drugs used in chronic kidney disease and other comorbid conditions and to identify which drug is mostly prescribed at that hospital. To assess the rationality of prescription. To evaluate the medication adherence in CKD patients. The study on prescribing pattern definitely improves the quality of prescription writing, so study of drug prescribing pattern is relevant in the present scenario. To evaluate the prevalence of correct dosing in chronic kidney diseases depending on renal function estimation. **Methodology**: This is a retrospective, prospective observational study conducted over a period of six months. The study was conducted at Medicine ward of GLENEAGLES AWARE GLOBAL HOSPITAL LB. NAGAR. Patients who admitted to Nephrology department of the hospital during a six- month period from October 2020 to March 2021 are enrolled. CKD patients visiting the nephrologists are evaluated, diagnosed and prescribed with suitable therapy. All necessary details were collected from patient demographics, prescription chart, lab data, progress chart, medical records, doctor's notes, nursing notes using a suitable designed data collection form. **Results: -** One hundred one patients were included in the project; with a mean age of 62.5. ± 18 years. More than half of patients were male, 77(76.2%). The mean BMI was 26 ± 1.15 kg/ m2. The majority of patients were having normal weight 80 (79.2%), 15 (14.8%) patients had overweight, and obesity and only 6 (5.9%) patients were underweight. While 35 (34.6%) patients were smokers, 10 (9.9%) were ex-smokers and 56 (55.4 %) patients were non-smokers. Anti- hypertensive agents are predominantly used among the patients. The most preferred options were beta blockers, calcium channel blockers and diuretics. Most of the physicians prescribed metoprolol (18.2%), amlodipine (38.3%), and cilnidipine (2%). Diuretics were the preferred option by the physician furosemide (92.3%), anti-platelets that are prescribed by the physicians are Aspirin (69.2%), clopidogrel (30.7%). Among the lipidlowering agents, atorvastatin (92.8 %) was given to the most of the patients. sulbactam(20.4%), cefoperazone (20.4%), clarithromycin (10.25%), amoxycillin (10.25%) were mostly prescribed antibiotics in the study. **Conclusion: -** The study concluded that most of the patients included in the study were suffering from chronic kidney disease. These may be due to their food habits, smoking, less exercise and poor health hygiene. The maximum number of patients was male; it may be due to smoking and alcoholic habits. Comorbidities such as hypertension, hyperglycemia, albuminuria, renal structure, and sex hormones, have been reported to have different effects on males and females. Thus, CKD progression may differ depending on sex. Early recognition with timely initiation of treatment in collaboration with nephrologists will improve the care for CKD patients. Thus, physicians and Nephrologists play an important outcome in patients with CKD.

KEYWORDS: Chronic Kidney Disease, Prescription Pattern.

INTRODUCTION

The kidney disease outcome quality initiative (KDOQI) characterizes chronic kidney disease (CKD) as either damage of the kidney or diminished glomerular filtration pace of <60ml/min/1.73m2 for a long time. CKD is a worldwide threat to health for developing nations specifically in light of increasing incidence, insignificant outcome and expenses of the treatment.[1] The reason India turning into main repository of CKD can be ascribed to developing predominance of diabetes and hypertension.

Proper drug selection for the patients with CKD is crucial to keep away the undesirable drug effects and to guarantee ideal results.[2] In the beginning phase of CKD, the treatment is fundamental just for the conditions like diabetes, hypertension and other primary risk factors and to reduce the progression of disease. However, as the kidney function declines, various drugs are administered to oversee the conditions such as mineral and bone problems, hyperlipidemia, anemia and cardiovascular events. When the patient reaches stage 5, they may require 10-12 drugs.[3]

Prescription patterns changes with various treating doctors, disease condition and populace being dealt with makes it imperative to study medication utilization over a period of time.[4] Prescription pattern studies in chronic kidney disease can help to propose changes in prescribing practices to make clinical consideration adroit. Nevertheless, in India there is no depiction overall drug profile in CKD patients. Hence, the study was expected to assess the physician's prescribing pattern.[5]

Classification of CKD.

STAGE	DESCRIPTION	GFR ml/min/1.73m2	RELATED TERMS
1	Kidney damage with normal or GFR	≥90	Albuminuria, proteinuria, hematuria
2	Kidney damage with mild GFR	60–89	Albuminuria, proteinuria, hematuria
3	Moderate GFR	30–59	Chronic renal insufficiency, early renal insufficiency
4	Severe GFR	15–29	Chronic renal insufficiency, late renal insufficiency, pre-ESRD
5	Kidney failure	<15(ordialysis)	Renal failure, uremia, end-stage renal disease

Stage Renal Disease

End-stage renal infection (ESRD) is characterized as irreversible decrease in an individual's own kidney work, which is serious to be fatal without dialysis or transplantation. ESRD is incorporated under stage 5 of the National Kidney Foundation Kidney Disease Outcomes Quality Initiative classification of chronic kidney disease (CKD), where it alludes to people with an expected glomerular filtration rate under 15 mL each moment for every 1.73 m^2 body surface region, or those requiring dialysis independent of glomerular filtration rate. Decrease in or nonappearance of kidney work prompts a large group of maladaptive changes including liquid maintenance (extracellular volume over-load), anemia, disturbances of bone and mineral metabolism, dyslipidemia, and protein energy malnutrition. This audit manages ESRD in adults only. Fluid retention in individuals with ESRD contributes significantly to the hypertension, ventricular dysfunction, and overabundance cardiovascular events saw in this populace. anemia related with CKD is normocytic and normochromic, and is most regularly ascribed to diminished erythropoietin synthesis by the affected kidneys. Extra factors add to the anemia, including: iron insufficiency from successive phlebotomy, blood retention in the dialyzer and tubing, and gastrointestinal bleeding; serious optional hyperparathyroidism; acute and chronic inflammatory conditions (e.g., infection) and shortened red blood cell survival.

Etiology

Diabetes and hypertension are the most basic causes of CKD. Hypertensive nephrosclerosis diabetic nephropathy are the most well-known causes for ESRD The another frequent reason was CKD of undetermined etiology continued in practically equivalent recurrence by ongoing glomerulonephritis and hypertensive nephrosclerosis.[12]

Obesity is a significant danger factor of CKD. It causes cardiovascular and renal illnesses through a few systems including hypertension, hyperglycemia, dyslipidemia, irritation and atherosclerosis. Plainly abundance weight acquires, particularly when joined by expanded instinctive fat, is related with numerous highlights of metabolic condition which increment the danger for the advancement of CKD. Ectopic fat accumulation in and around the kidney may likewise have unfavorable outcomes on renal capacity.[13]

Glomerulonephritis most common reasons for end-stage renal illness. It is characterized as infection portrayed by intraglomerular aggravation and cell expansion related with hematuria. Patients with glomerulonephritis for the most part present with one of five clinical disorders: asymptomatic hematuria, intense glomerulonephritis, quickly progressive glomerulonephritis, the nephritic syndrome, or persistent glomerulonephritis.[14]

Dyslipidemia is a typical cause of CKD and lipoprotein digestion adjustment and is related with the decrease in GFR; thus, lipid profile relies upon the degree of kidney work and the level of proteinuria.[15]

Proteinuria is a solid marker of CKD movement. Proteinuria may speed up kidney infection progression to ESRD.[16]

Pathophysiology

Damage of the kidney may result from various heterogeneous factors. Hence, the initial structural damage may rely upon major disease affecting the kidney. Nonetheless, most of the progressive nephropathies have a final common pathway to irreversible renal damage and ESRD. The three major elements of this pathway are: a) loss of nephron mass, b) proteinuria and c) glomerular capillary hypertension.

The subjection to initiation risk factors may result in loss of nephron mass. The remaining nephrons exaggerate to compensate the loss. Over a period, the exaggeration can may to the development of intra glomerular hypertension, possibly mediated by angiotensin II.

For both afferent and efferent arterioles, Angiotensin II acts as a potent vasoconstrictor. But preferably it acts on the efferent arteriole, which leads to increase in pressure within the glomerular capillaries and consequent increase in filtration fraction. The intra glomerular hypertension development correlates with the systemic arterial hypertension development. High intra glomerular pressure damages the size selective ability of glomerular permeability barrier, which results in increased urinary excretion of albumin and frank proteinuria. Angiotensin II may also mediate progression of renal damage through non hemodynamic effects.

Proteinuria alone can accelerate the loss of nephrons as a result of direct cell damage. Filtered proteins like albumin, transferrin and angiotensin II are toxic to tubular cells of the kidney. Various studies have shown that the presence of these proteins in renal tubule activates the tubular cells, may lead to the increased production of inflammatory and vasoactive cytokines. Proteinuria is also connected with the activation of complement elements on the membrane of proximal convoluted tubules. Evidences now recommend that intra tubular complement activation may be the crucial mechanism of damage in the progressive protein uric nephropathies. These circumstances ultimately lead to the damage of the interstitium, gradual loss of structural nephron units and reduction of glomerular filtration rate. (JOSEPH T. DIPIRO, 1999).

Treatment

Non Pharmacological Therapy

Lifestyle modification and dietary adjustments are effective in explicit types of CKD. Doctors should suggest all the patients with chronic kidney disease to stop smoking; exercise for at least half an hour;reduce alcohol consumption; maintain body mass index and eat a diet that includes fruits, vegetables and whole grains. The DASH (dietary approach to stop hypertension) diet is suggested for the patients with glomerular filtration rate >60 ml/min/1.73m2 and stage 1 hypertension but not for those with glomerular filtration rate <60ml/min/1.73m2 (stage 3 or 4), since it contains higher than suggested measure of protein, potassium and phosphorous. Even though, salt restriction is questionable in general population, CKD patients with hypertension should confine their dietary salt intake to <2.0 g/d. Patients with CKD should not take high-protein diets (>1.3 g/kg/day). Finally, patients with CKD stage 4 or 5 must take a low protein diet (0.6g/kg/day) under the direction of a dietician specialized in renal disease.

Drugs and other agents causing acute kidney injury in patients with CKD

Patients with chronic kidney function are significantly more liable to acute kidney injury from nephrotoxic agents than people with normal kidney function. Hence, known nephrotoxic drugs like aminoglycosides antibiotics, amphotericin B, NSAIDs and radio contrast drugs must be avoided. If the radio contrast agents are fundamental, intravenous sodium bicarbonate or 0.9% saline must be administered before and after the procedure for the patients who are at increased risk for nephropathy. Patients with CKD stage 4 or 5 should not be exposed to higher doses of gadolinium because of the risk for nephrogenic systemic fibrosis. Although, not really a risk factors for renal injury, the dosing of several drugs should be changed in order to avoid adverse effects.

Management of CKD associated diabetes

Diabetes is the most common reason for end stage renal disease (ESRD). Patients with diabetes and CKD must maintain great glycemic control to decrease the rate of proteinuria, advancement of CKD and conceivably decrease the incidence of ESRD. CKD patients whose GFR is <30 ml/min/1.73m2, must avoid the usage of metformin.

Management of Anemia

Anemia accompanies with deterioration of CKD as production of erythropoietin declines. Anemia in CKD patients is associated with left ventricular hypertrophy and cardiovascular complications. Despite the fact that patients with normocytic, normochromic anemia and low reticulocyte count, probably going to have the anemia of CKD, CKD isn't really the sole reason for anemia. The examination of patients with anemia and CKD must include hemoglobin estimation, hematocrit value, RBC count, reticulocyte count, iron levels, transferrin saturation, and vitamin B12 and foliate levels. Patients with iron deficiency must be assessed to recognize the potential source of bleeding.

Based on investigational studies that show improvement in functional status but not mortality, current guidelines propose that doctors should consider treating CKD and anemia patients with erythropoietin when hemoglobin range is between 9-10 g/dL. Adequate iron stores are important for success in the treatment of anemia of CKD because iron is important factor for the formation of hemoglobin and erythropoiesis. Recommend oral or

intravenous iron depending upon the situation to maintain adequate iron stores (TSAT >20% and serum ferritin >100 ng/mL.

Management of cardiovascular risk factors
In addition to promoting life style modification, cardiovascular risk factors should be evaluated by measuring blood pressure, getting a fasting lipid profile and screening for diabetes. Diabetes and hypertension must be treated. The American college of cardiology guidelines for elevated cholesterol shouldbe followed but with a couple of exceptions: Given the risk of cardiovascular disease among adults aged 50 years or more established with chronic kidney disease, the guidelines suggest treatment with a statin or statin-ezetimibe despite of cholesterol range and do not suggest focusing on specific total cholesterol and low-density lipoprotein range in most patients.

Indications for renal replacement therapy
Regular indications to start dialysis are volume overload non response to diuretics, uremic encephalopathy and nonresponse of hypertension to treatment. Hyperkalemia and metabolic acidosis that can't be overseen therapeutically and reformist "uremic" symptoms like fatigue, nausea, vomiting, loss of appetite, malnutrition and sleeping disorder are signs for initiation of renal replacement therapy.[19]

METHOD AND MATERIAL

Study site
The study is carried out in patient department of nephrology in tertiary care hospital, erode, Telangana, India.

Study design
This is a retrospective, prospective observational study to be conducted over a period of six months (i.e., October 2020 to march 2021). The study is conducted at medicine ward of Aware Global Hospital, LB Nagar, Hyderabad, Telangana. All relevant patient's data is collected in a suitably designed patients datacollection form.

Study population
Inclusion criteria

Patients of either sex above 18 years. Any patient whose GFR is <60 ml/min/1.73 m^2 is included.
Patients who are at risk of CKD (e.g., Patients with diabetes, hypertension, or glomerulonephritis).Patients with hemodialysis.

Exclusion criteria
Patients below 18 years age. Outpatients Department (OPD) patients. Pregnant / lactating woman.

Study protocol
Designing a data entry form with all details of patient, medication and diagnostic methods, collecting the case histories of patients from medical records, analyzing the data and divided into various categories and concluding it prescription analyze has to be performed by the help of medical record.

RESULTS

Demographic data
One hundred patients were included in the project; with a mean age of 62.5 ± 18 years. More than half of patients were male, 77(76.2%). The mean BMI was 26 ± 1.15 kg/ m2. The majority of patients were having normal weight 80 (79.2%), 15 (14.8%) patients had overweight, and obesity and only 6 (5.9%) patients were underweight. While 35 (34.6%) patients were smokers, 10 (9.9%) were ex-smokers and 56 (55.4 %) patients were non-smokers.

Comorbidities
Patients in this study had multiple co-morbidities, with a mean number of 3.5 ± 1.5 per patient. The most common diseases among 101 patients with were hypertension 89 (88.1%), diabetes mellitus 52(51.4%), and ischemic heart disease 05 (4.9%), Hypothyroidism13 (12.8%).

Medications
A total of 117 medications were reviewed. Patients in this study were often prescribed multiple medications, with a mean number of 7.2 ± 3.6 per patient. The most commonly prescribed medicines are antibiotics (15%), followed by Antihypertensives (9.7%), Antidiabetics (6.7%), vitamins and minerals supplements (4.5%). More details are given in (Table 6).

Table 1: Prevalence of chronic kidney disease in study population.

Total number of patientsvisited thehospital during study period	Number of CKD patients	Percentage
1567	1O1	6.44%

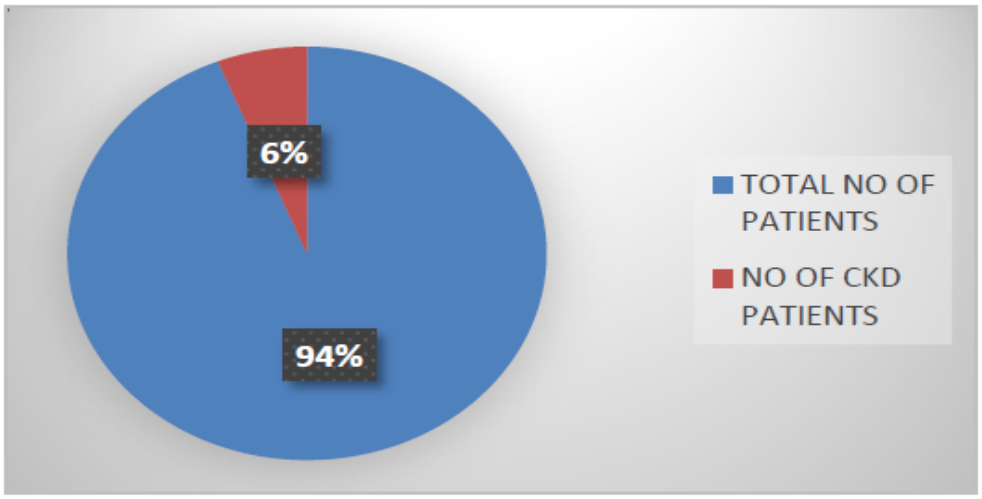

Figure 1: Prevalence of chronic kidney disease in study population.

Table 2: Gender wise Distribution of CKD patients.

SEX	Number of CKD patients	Percentage
MALE	77	76.2%
FEMALE	24	23.8%

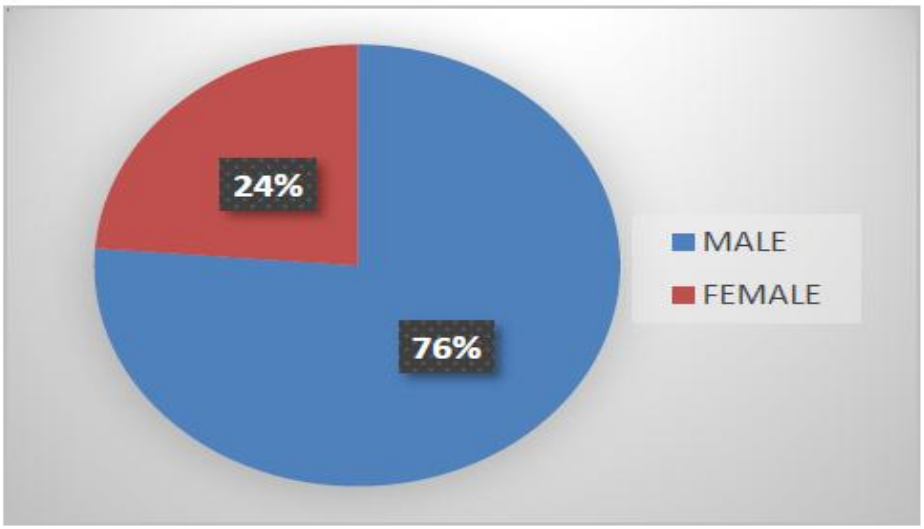

Figure 2: Gender wise Distribution of CKD patients.

Table 3: Co-morbid diseases.

Medical condition	Number of patients (n=101)	Percentage (%)
Hypertension	89	89.8
Diabetes Mellitus	52	52.2
Dyslipidemia	01	01
Ischemic heart disease	05	5.05
Liver disease	02	2.02
Heart failure	15	15.2
Seizures	03	03
HCV	11	11.1
Hypothyroidism	13	13.1
Anemia	11	11.1
Others	73	73.7

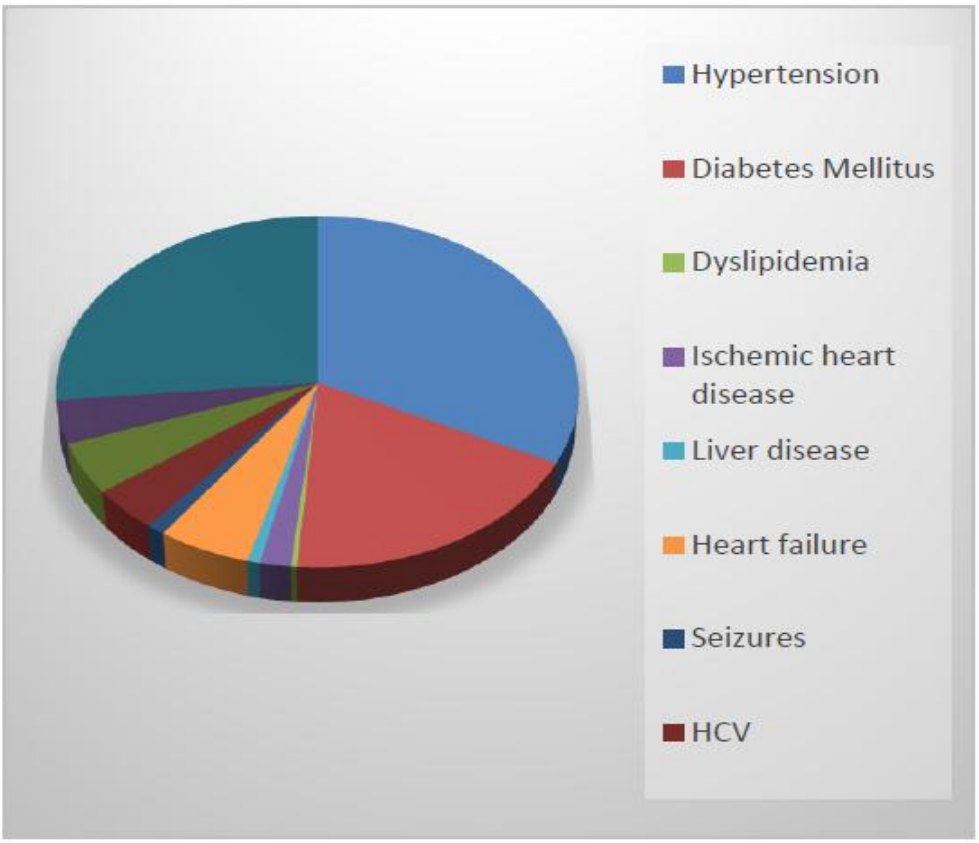

Figure 3: Co-morbid diseases.[3]

Table 4: The frequency distribution of various drugs used by studied patients.

Category of drugs	Number of Drugs (n=134)	Percentage
Antibiotics	20	15%
Antihypertensives	13	9.7%
Vitamins and minerals	7	4.5%
Antidiabetics	9	6.7%
Analgesic	3	2.2%
Antiasthmatics	9	6.7%
statins	2	1.5%
Diuretic	4	3.0%
Antiarrhythmics and antianginals	5	2.2%
Anticoagulants	2	1.5%
Anti-platelets	2	1.5%
Antiepileptics	4	3.0%
Antitubercular	5	3.8%
Proton pump inhibitors	4	3.0%
Laxative	17	3.0%
Antiemetic	2	1.5%
Antihistamines	5	3.8%
Benzodiazepines	7	5.3%
Antivirals	4	3.0%
Other drugs	29	21.8%

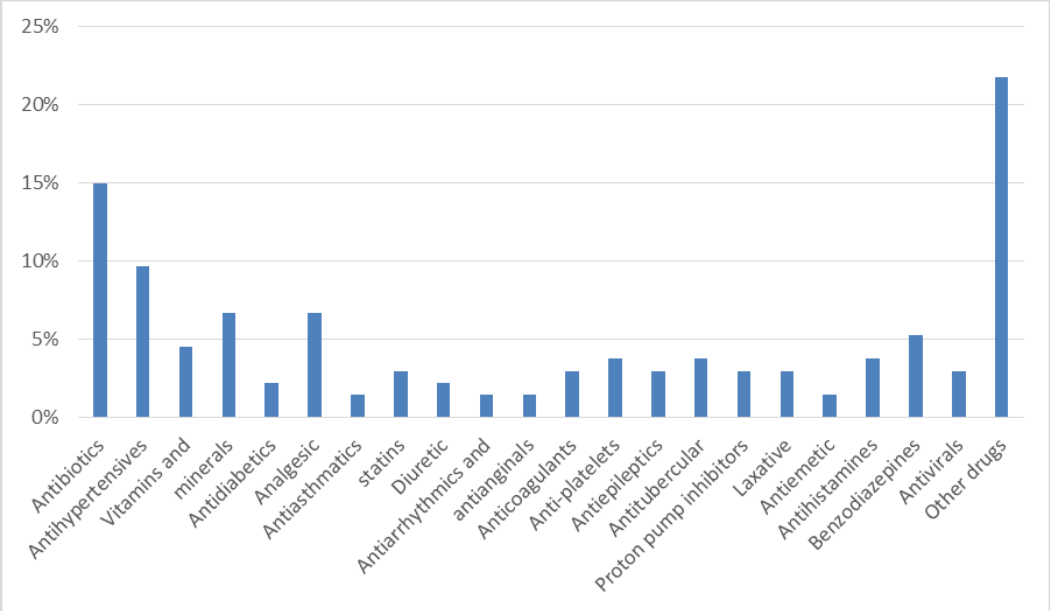

Figure 4: The frequency distribution of various drugs used by studied patients.

Table 5: Antibiotics.

Class	Antibiotics	Number Of Drugs (N=244)	Percentage
Fluoroquinolones	Ofloxacin	5	2 %
	Moxifloxacin	1	0.4 %
Penicillins	Amoxicillin	25	10.2 %
	Piperacillin	3	1.2 %
Betalactamaseinhibitors	Clavulanicacid	5	10.2 %
	Tazobactam	3	1.2 %
	Sulbactam	50	20.4 %
Cephalosporins	Cefixime	23	9.4 %
	Cefoperazone	50	20.4 %
	Ceftriaxone	4	1.6 %
Macrolides	Clarithromycin	20	8.1 %
	Azithromycin	2	0.8 %
Carboxylic Acids	Mupirocin	1	0.4 %
Lincosamides	Clindamycin	3	1.2 %
Oxazolidonones	Linezolid	3	1.2 %
Carbapenems	Meropenem	3	1.2 %
Aminoglycoside	Amikacin	12	4.9 %
Tetracyclines	Doxycycline	3	1.2 %
Glycopeptides	Vancomycin	6	2.5 %
Nitroimidazoles	Metronidazole	2	0.8 %

Table no 6: Phosphate binders used in study population.

Phosphate binders	Number of drugs (n=7)	Percentage (%)
sevelamer	6	85.7%
Calcium polysterate sulphonate	1	14.2%

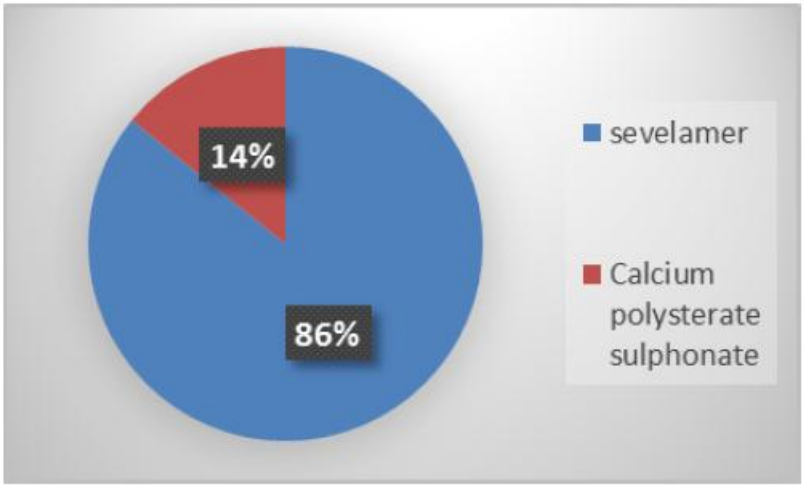

Figure 5: Phosphate binders used in study population.

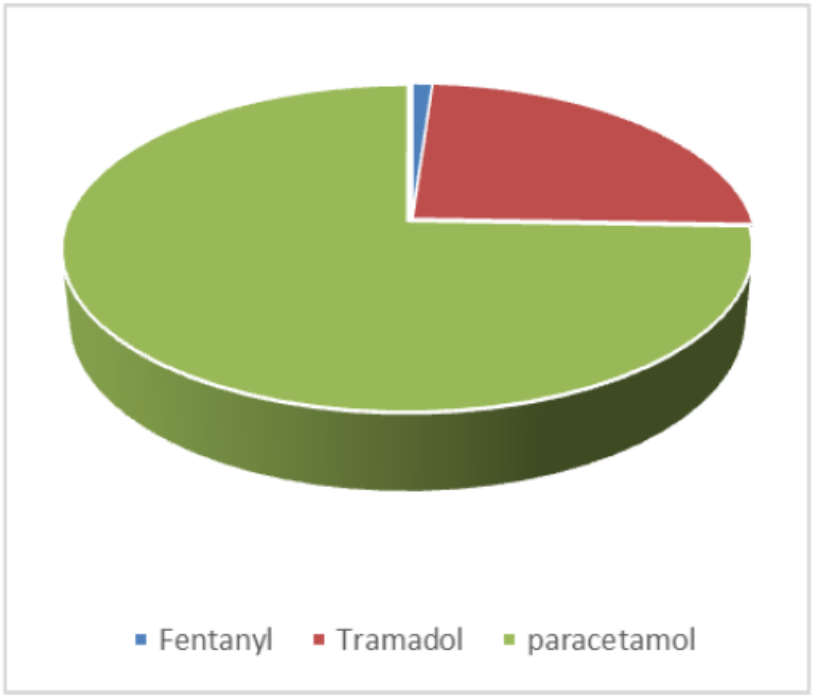

Figure 6: Analgesics.

Table no 7: Analgesics.

Analgesic	Number of DRUGS (N=90)	Percentage
Fentanyl	1	1.1%
Tramadol	22	24.4 %
paracetamol	67	74.4%

Table no 8: Anti coagulants.

Anticoagulants	Number of drugs (n=3)	Percentage (%)
Enoxaparin	1	33.3 %
Heparin	2	66.6 %

Figure 9: Antiplatelets.

Antiplatelets	Number of drugs (n=39)	Percentage (%)
Clopidogrel	12	30.7 %
Aspirin	27	69.2 %

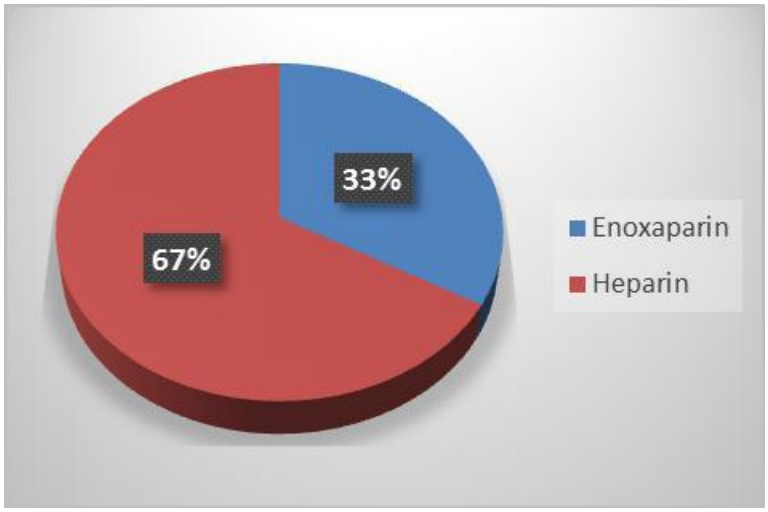

Figure 7: Anti coagulants.

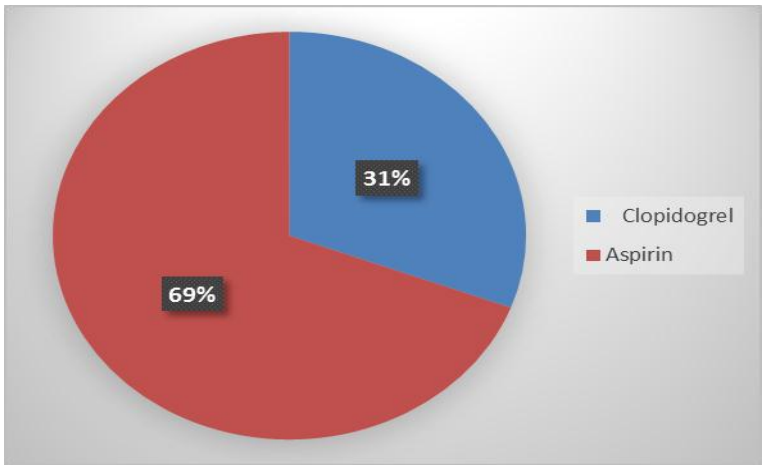

Figure 8: Statins.

Table 10: statins.

Statins	Number of drugs (n=28)	Percentage (%)
Rosuvastatin	2	7.1 %
Atorvastatin	26	92.8 %

Table 11: Antidiabetics.

Anti-diabetics	Number of drugs (n=96)	Percentage (%)
Human mixtard	38	48.6 %
HumanInsulin	16	16.2 %
Glargine	1	2.7 %
Aspartate	1	2.7 %
Gliclazide	1	2.7 %
Glimepiride	16	16.2 %
Glipizide	1	2.7 %
Metformin	21	5.4 %
Vildagliptin	1	2.7 %

Table 12: Antihypertensives.

CLASS	Antihypertensives	Number of drugs (n=159)	Percentage (%)
Calcium channel blockers	Amlodipine	61	38.3%
	Cilnidipine	7	4.4%
	Diltiazem	2	1.25%
Angiotensin receptor blockers	Telmisartan	4	2.51%
	Olmesartan	4	2.51%
	Losartan	2	1.25%
Beta blocker	Metoprolol	29	18.2%
	Bisoprolol	1	0.62%
	propranolol	1	0.62%
Alpha blocker	Prazosin	23	14.5%
	Tamsulosin	7	4.4%
Alpha agonist	Clonidine	14	8.8%
Alpha +Beta blocker	Carvedilol	4	2.51%

Table 13: Vitamins and minerals.

Vitamins and minerals	Number of drugs (n =167)	Percentage (%)
B plex forte	55	32.9%
Ascorbic acid	11	6.6%
Cholecalciferol D3	27	16.1%
Iron	15	9.0%
Calcium	15	9.0%
Recombinant human erythropoietin alpha	40	24.0%
Methoxy polyethylene glycolepoetin beta (ESAs)	4	2.4%

Table 14: Antiasthmatics.

Class	Drugs	Number Of Drugs (N=40)	Percentage (%)
Bronchodilators	Acebrophylline	3	7.5%
	Levosalbutamol	15	37.5%
	Salbutamol	2	5.0%
	Ipratropium	6	15%
Mucolytic agents	Ambroxyl	3	7.5%
	Acetylcysteine	4	10%
Expectorant	Guaifenesin	2	5.0%
Corticosteroids	Budesonide	2	5.0%
	Hydrocortisone	3	7.5%

Table 15: Antiepileptics.

Antiepileptic Drugs	Number of drugs(n=12)	Percentage(%)
Levetiracetam	8	66.6 %
Pregabalin	2	16.6 %
Phenytoin	1	8.3 %
Divalproex	1	8.3 %

Table 16: Antiarryhmatics and anti anginaldrugs.

Class	*Drugs*	Number Of Drugs (N=68)	Percentag E (%)
Antiarrhythmic drugs	Amiodarone	1	1.5 %
Anti-anginal drugs	Isosorbide mononitrate	60	88.2%
	Isosorbide dinitrate	3	4.4 %
	Nicorandil	3	4.4 %
	Trimetazidine	1	1.5 %

Table no 17: Diuretics.

Diuretics	Number of drugs (n=65)	Percentage (%)
Metolazone	1	1.5 %
Furosemide	60	92.3 %
Torsemide	3	4.6 %
chlorthalidone	1	1.5 %

Table no 18: Inotropes.

Inotropes	Drugs	Number of drugs(n=14)	Percenta ge (%)
Cardiac glycosides	Digoxin	3	21.4%
Direct sympathomimetics (synthetic)	Dobutamine	3	21.4%
(endogenous)	Noradrenaline	8	57.1%

Table no 19: Antivirals.

Antivirals	Number ofdrugs (n=6)	Percentage (%)
Abacavir	3	50 %
Lamivudine	1	16.6 %
Atazanavir	1	16.6 %
Ritonavir	1	16.6 %

Table no: 20 Benzodiazepines.

Benzodiazepines	Numberof drugs(n=11)	Percentage (%)
Alprazolam	2	18.1%
Clonzepam	3	27.2%
Chlordiazepoxide	1	9.09%
Lorazepam	1	9.09%
Midazolam	2	18.1%
Carbamazepam	1	9.09%
Clobazam	1	9.09%

Table No 21: Antihistamines.

Antihistamine	Number of drugs(n=18)	Percentage (%)
Pheniramine	4	22.2 %
Fexofenadine	2	11.1 %
Hydroxyzine	3	16.6 %
Levocetirizine	7	38.8 %
Cyproheptadine	2	11.1 %

Table 22: Laxative.

Laxative	Number ofdrugs (n=17)	Percentage (%)
Lactulose	12	70.5 %
Bisacodyl	2	11.7%
Sodium phosphate	1	5.8%
Polyethylene Glycol	1	5.8%
Liquid paraffin	1	5.8%

Table no 23: other drugs.

Class	Drugs	Numberof drugs (n=113)	Percentage (%)
protectants	Sucralfate	2	1.8%
Hepatic protectants	Ursodeoxylic acid	2	1.8%
Alkalizing Agent	Sodium bicarbonate	16	14.1%
Neuromuscular blocker	vecuronium	1	0.8%
Xanthine oxidase inhibitor	febuxostat	10	8.8%
H2 receptor blocker	Ranitidine	3	2.65%
Antipsychotics	Levosulpiride	4	3.5%
Histamine Agonist	Betahistine	1	0.8%
Phenythylamine	Amphetamine	2	1.8%
Antifibrinolytics	Tranexamic acid	3	2.65%
Tricyclic Antidepressants	Amitriptyline	3	2.65%
Anticholinergic	Hyoscine butylbromide	2	1.8%
Serine proteases(enzyme)	Trypsin chymotrypsin	4	3.5%
Carnitine Analog	Levocarnitine	15	13.2%
Thyroid hormone	Thyroxine	10	8.8%
Calcium supplement	Calcium gluconate	4	3.5%
	Calcium lactate pentahydrate	2	1.8%
Antacid	Calciumcitrate	10	8.8%
Alpha blocker	Tamsulosin	5	4.42%
Volume expanders	Human Albumin	4	3.5%
Skeletal muscle relaxant	Baclofen	1	0.8%
Potent local anesthetic	Oxetacaine	1	0.8%
Amino acids	Taurine	1	0.8%

DISCUSSION

The layout of the most fulfilling dosage routine for suffers with CKD is depending on the provision of a correct characterization of the connection among the pharmacokinetic parameters of the drug and renal function, and a correct evaluation of the suffers renal function. Before 1998, there has been no consensus concerning the specific standards for characterization of the connection among the pharmacodynamics and pharmacokinetics of a drug and renal function.

The United States Food and Drug administration (FDA) enterprise steering issued in May 1998 supplied a framework to assist business determine after they ought to behavior such as "characterization" take a look at and proposed clean guidelines for examined layout, records, analysis and evaluation of drug effect on drug dosing. Thus, the excellence of records to be had to clinicals has stepped forward dramatically with inside the final ten years.[25]

Demographic Data

In this examine 101 patients were included with a mean age of +70 or -20 years. More than half of them were male,77 (76.2%) and 24(23.8%) were female. Our study tallies the third national health and nutrition examination survey (NHANES iii), a national investigation of more than 18,000 persons 20 years of age or older conducted from 1998 through 1994 provides information at the ranges of CKD with inside the U.S population. From these data, populations at increased risk for developing ESRD include the older population particularly patients 6 years of age and older. More than 49% of hemodialysis patients in 2004 were age 65 or older, a much larger % than for the peritoneal dialysis and transplant populations.[26,27]

Co-Morbidities

Sufferers on this look at had more than one comorbidity, with a mean number of in keeping with patient. The maximum not unusual place illnesses amongst them have been high blood pressure 89(89.8%) diabetes mellitus

52(52.2%), dyslipidemia 01(1%) and ischemic heart disease 5(5.05%) the main reasons of ESRD, in suffers newly identified with inside the USA 2004 had been Diabetes Mellitus (44%) Hypertension (27%).

Patients with advanced stages of CKD have many health problems, including salt and water retention, phosphate retention, diabetes, hypertension, chronic anemia, hyperlipidemia, and heart disease. To address all these medical problems, most patients require fluid restriction, multiple dietary restrictions, phosphate binders, vitamin D preparations, antihypertensive medications, hypoglycemic agents, erythropoietin, iron supplements, and a variety of other medications. Themost commonly used medications in this study expected based on the comorbidities and complications of CKD.

Ortega et al., In CKD patients, Metabolic acidosis is seen in early stages of renaldysfunction. Pathogenesis shows the lack nof bicarbonate production due toaccumulation of acids that lead to the development of tubulo interstitial damage through retention of ammonium and deposition of compliment. This is mosthly treated by sodium bicarbonate.

Hemodialysis patients were on more medications for management of renal complications and for management of symptoms. We also found that Benzodiazepines and opioids were most likely prescribed in Hemodialysis patients. The most commonly prescribed PPI's were pantoprazole (92 %).

Metoclopromide

When crcl is found to be <50 ml/min, give 75% of normal Metoclopramide. In those patients whose crcl is lower than 40 ml/min, treatment should be started at approximately the half of the standard dosage.[0] Since metoclopramide is eliminated mainly through kidneys, and the risk of toxic reactions to this drug maybe higher in patients with renal insufficiency. According to clinical efficacy and safety considerations, the dosage may be increased or decreased as appropriate. Not dialyzable (0% to 5%), supplemental dosing is not necessary.

Metronidazole

If crcl < io or severe hepatic dysfunction. Adult dose is 500 mg po/iv q 8 hrs. Same for adults and pediatric. consider 50% at same interval if >14 days duration. (52,53) intermittent hemodialysis (1 HD) (Deliver metronidazole after hemodialysis on dialysis days) Dialyzable (50% to 100%). A dose of 0.5 g each 2 0r 3 instances daily. Dosing regimen is highly dependent on clinical indication. Dosing reliant on the idea of three times weekly. Complete the IHD sessions. Continuous Renal Replacement Therapy (CRRT). Medicine removal is fantastically depending on the technique of renal replacements, the price of go with the drift & kind of filter. Right dosing wishes mean tracking of pharmacological effect, Symptoms and symptoms of detrimental reactions because of accumulation, in addition to drug concentrations approximately goal through (if applicable).

Rosuvastatin

Rosuvastatin competitively inhibits HMG-coA reductase enzyme selectively and reversibly. Rosuvastatin is a totally HMG-coA reductase inhibitor. It is much less lipophilic than different statins along with atorvastatin and simvastatin however greater lipophilic than pravastatin. After a single oral dose, the peak plasma concentration is reached at 5 hrs. Food intake decreasing the rate of absorption of rosuvastatin by 20% but not the extent of absorption. Approximately 90% of Rosuvastatin is protein bound mainly to albumin. Mean volume of distribution is 134 liters in steady state. Approximately 72% of absorbed rosuvastatin is eliminated in bile and 28% via renal excretion. Rosuvastatin consequently decreases hepatic sterol synthesis, which in turn, results in a reduced attention of hepato cellular cholesterol.

vancomycin is a bacterial antibiotic with activity against more gram-positive organisms such as methicillin- resist staphylococcus aureus (MRSA) and streptococcus. Species consisting of a few isolates enterococcus daedauls. Its far used empirically withinside the febrile neutropenic affected person due to the fact the occurrence. Normally doses are designed to achieve peak levels of 25-40 mg/l and through levels of 10-15 me. Some clinicals have suggested, however that plasma levels>80 my/L May correlate with auditory dysfunction.

Vancomycin

Vancomycin is poorly absorbed through oral should be administered intravenously while used to deal with systemic infections. As with many different antibiotics, vancomycin typically is cleared through the kidneys. Significant toxicities were related to prove serum concentrations. The correlation among vancomycin toxicity e.g. (oto toxicity) it has an removal half-life of 3-9 hours in suffers with regular renal function, this will increase to 129-189 hours in suffers with ESR.

Furosemide

Furosemide is a loop diuretic. The food and drug administration (FDA) has authorized furosemide to deal with conditions like volume overload and edema secondary to congestive heart failure, liver failure or renal failure, including nephrotic syndrome. Furosemide is available in oral and iv formulation. Administration of this can be in the form of tablets or an oral solution. The average bioavailability is approximately 50% with a range of 10-100%.

It is a second line agent in heart failure patients with advanced kidney disease with an estimated GFR, < 30ml/min. It inhibits tubular reabsorption of sodium and chloride inside the proximal and distal tubules and thick ascending loop of Henley by inhibiting Na+ cl- transport system resulting in excessive excretion of water along

with sodium, chloride and magnesium. The half-life of furosemide is around 2 hours, and the overall time of therapeutic effect is 6 to 8 hours. In healthy volunteers, more than 95% of furosemide bound to plasma proteins.

Amlodipine

Amlodipine is di hydro pyridine which inhibits the slow L type voltage gated calcium channel, preventing their entry into the vascular and cardiac tissue. It is an extremely slow acting drug which takes about 2 hours to act and has a bioavailability of 60 to 65%. Amlodipine also inhibits potassium channel causing peripheral vasodilation, increase myocardial oxygen supply and increase coronary blood.

It decreases glomerular resistance and increases renal blood flow. After oral administration, amlodipine is slowly and completely absorbed with Tmax occurring after 6 to 8 hours. The drug is 95% protein bound and is extensively metabolized in the liver by CYP450 enzyme and through oxidative deamination. More than 75% of metabolites are excreted in urine with a half- life of about 30-40 hours, which increases to 56 hours in hepatic failure, thus requiring a small dose.

CONCLUSION

The study concluded that most of the patients included in the study were suffering from chronic kidney disease. These may be due to their food habits, smoking, less exercise and poor health hygiene. The maximum number of patients was male; it may be due to smoking and alcoholic habits. Comorbidities such as hypertension, hyperglycemia, albuminuria, renal structure, and sex hormones, have been reported to have different effects on males and females. Thus, CKD progression may differ depending on sex. Early recognition with timely initiation of treatment in collaboration with nephrologists will improve the care for CKD patients. Thus, physicians and Nephrologists play an important outcome in patients with CKD.

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CONFLICT OF INTEREST

The authors declared no conflict of interest.

ABBREVIATION USED

CKD: Chronic Kidney Disease, CLCR: Creatinine Clearance, EGFR: Estimated Glomerular Filtration Rate, GFR: Glomerular Filtration Rate, RAS: Renin Angiotensin System.

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