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A STUDY ON TREATMENT OUTCOMES BASED ON DIFFERENT STAGES OF CHRONIC KIDNEY DISEASE

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ABSTRACT

Aim: The aim of this study was to study the treatment outcomes based on different stages of chronic kidney disease and to know any improvements in the kidney function by observing lab parameters using disease specific and patient specific. **Methods:** A Prospective and Observational study was performed on 70 patients which conducted in Medicine and Nephrology department of Sagar Multi-Speciality Hospital. Age distribution of patients studied was from age of 20-80years. Lab parameters such as Serum creatinine, BUN, Urine analysis and biomarkers assessment will be conducted centrally. An overview treatment outcomes of Ckd based on assessment of GFR rate in each stage will be estimated and submitted. **Results:** From the study it was observed that (71.4%) of patients have Hypertension, as risk-factor and (54.3%) of patients have Diabetes Mellitus and (10.0%) of patients have Family History. Out of 5 stages of CKD most patients are in (ESRD) Stage V (52.9%) followed by Stage IV (32.9%). The treatment was based on Sr Cr, GFR, BUN levels in our study we have observed that very less number of patients were having normal level of Serum Creatinine and it was identified that 7.1% of patients had shown good improvement at the time of discharge, and most of the patients have less than 15ml/min GFR value (52.9%) more than 90ml/min (1.4%), in our study we have observed that 45.7% of patients shown normal level of GFR at the time of discharge. **Conclusion:** In our study we observed that Males are more prone to chronic kidney disease than Females and mostly stage-V CKD patients were more identified than stage-IV CKD, with majority of patients at the age of 51 to 60 years. Treatment was provided in-order to minimize individual patient risk factors along with management of CKD. And hypertension is the major risk factor followed by Diabetes Mellitus.

KEYWORDS: Chronic Kidney Disease, Diabetes mellitus, Hypertension, Glomerular filtration rate, Creatinine.

INTRODUCTION

The kidney is a specialized tissue that plays a vital role in maintaining body homeostasis. The main functions can be categorized as follows:1. Maintenance of body composition: The kidney regulates the volume of fluid in the body; its osmolarity, electrolyte content, electrolyte concentration and acidity by varying the amounts of water and ions excreted in the urine. 2.Excretion of metabolic end products and foreign substances: The kidney excretes a number of products of metabolism, most notably urea, and a number of toxins and drugs. 3.Production and secretion of enzymes and hormones: The kidney is a source for several important hormones such as renin, which catalyses the formation of angiotensin, the key peptide for blood pressure regulation, erythropoietin, which regulates the production of red blood cells, and activated vitamin D3, which regulates body calcium and phosphate balance.[1] If not treated over time, it leads to Kidney failure also called as End stage Renal disease.[2] CKD is common

among elderly leading to some professional organizations to recommend routine age base screening for CKD in primary care, however little is known about clinical course of CKD in older individuals.[3] A number of epidemiologic studies assessed the prevalence of CKD in different populations and used different equations to estimate kidney function. The prevalence of CKD varied strongly with age. Most of the included studies also presented a gender-specific prevalence of CKD.[4] Proteinuria, hypertension, CVD, diabetes, race, and ethnicity are strong risk factors for progression from CKD to ESRD, and the higher ESRD incidence among men than among women is most pronounced in older patients.[5] Identification of cause of kidney disease is one of the goals in evaluation of CKD, and may lead to changes in management of CKD. CKD could be classified according to severity, diagnosis, treatment, and prognosis. Stages of Chronic Kidney Disease (CKD): Below is the classification & stages of chronic kidney disease.

Stages	Description in ml/min/1.73m^2	Related terms
1	Kidney damage with normal or ↑GFR≥90	Albuminuria, Proteinuria, Heamaturia
2	Kidney damage with mild or ↓GFR 60–89	Albuminuria, Proteinuria, Heamaturia
3	Moderate or ↓GFR 30– 59	Chronic renal insufficiency, early renal insufficiency
4	Severe or ↓GFR 15–29	Chronic renal insufficiency, late renal insufficiency, pre-ESRD
5	Kidney failure GFR<15 (or Dialysis)	Renal failure, uremia, end-stage renal disease.[7]

Renal function tests (RFT's): The most common test to assess renal function is to get an estimate of Glomerular filtration rate (GFR). GFR: The level of glomerular filtrate rate (GFR) is accepted as the most useful index of kidney function in health and disease. Reduction in GFR is associated with symptoms and laboratory manifestations of kidney disease. Decreased GFR in chronic kidney diseases is preceded by alterations in structure that can be detected by pathologic disturbances or markers of kidney damage. Widespread reporting of estimated GFR using the MDRD Study equation simplifies the detection of CKD defined as GFR < 60 ml/min/1.73m^2 [<1 ml/min/1.73m^2][8] Blood Urea Nitrogen (BUN): This renal test also measures the amount of urea nitrogen in the blood. It is nitrogen containing compound that is formed in liver as end product or protein metabolism. This BUN provides a rough measurement of GFR, the rate at which blood is filtered in kidneys. Serum creatinine: It is also utilized in GFR estimating equations such as modified diet in renal disease (MDRD)and the CKD-EPI equation. Demographic factors (age, gender, race), health behaviours (smoking), co-existing illnesses (diabetes and hypertension), physical exam findings (body mass index, systolic and diastolic blood pressure), and laboratory values (total cholesterol, creatinine and glucose) were ascertained at study entry. Chronic kidney disease (CKD) is becoming a major public health problem worldwide. Moreover, current evidence suggests that hypertension and diabetes are the two major causes of kidney disease worldwide. In addition, CKD has a complicated interrelationship with other diseases. Recent studies have reported that CKD is an independent risk factor for cardiovascular disease (CVD). The number of elderly patients with chronic kidney disease (CKD) stage 5 is increasing steadily.

A study on patients with Chronic kidney disease is to assess treatment patterns and patient outcomes.

METHODOLOGY

Study site
The study was conducted in Sagar Multi Specialty Hospital, Bengaluru.

Study design
This was a Prospective and Observational study performed on 70 patients on A Study on Treatment Outcomes based on Stages of Chronic Kidney Disease.

Sample size
A total of 70 patients from the Medicine and Nephrology department of Sagar Multi Specialty Hospital, who satisfied the study criteria and consented to participate were included in the study.

Study period: The study was conducted over a period of 06 months starting from October 2019 to March 2020.

Ethical approval
Ethical committee clearance was obtained by the Institutional Ethical Committee of Sagar Multi Specialty Hospital.

Study criteria
Inclusion criteria
- Patients of both gender
- Patients of all stages of CKD
- Patients undergoing dialysis

Exclusion Criteria
- Patients below age of 14yrs
- Patients who have undergone kidney transplantation
- Patients who are not willing to consent for the study

Source of data
Patient's demographics, clinical findings, laboratory and therapeutic data were collected from inpatients and the main sources for the collection of data were:
1) Patients case notes 2) Treatment chart/ medication chart 3) Laboratory reports 4) Patient discharge cards

Study Procedure
1. Patient Enrollment
A hospital based prospective study was conducted in Medicine and Endocrinology department of Sagar Multi Specialty Hospital. The study was conducted on 70 patients who met the inclusion and exclusion criteria were enrolled in the study.

2. Method of Data Collection
It is a Prospective and Observational study which was conducted in the Nephrology & General Medicine department of Sagar multi-specialty hospital & Research centre by obtaining the ethical clearance. All the patients admitted with chronic kidney disease who meet the inclusion criteria was enrolled for the study. After the diagnosis is confirmed, the necessary baseline information such as demographic details like age & gender, date of admission, date of discharge of the patient was collected. Therapeutic data such as name of drugs, doses, route of administration, duration & other laboratory data was collected and documented in a

previously designed data collection form. The follow ups were carried out till the day of discharge for the enrolled patients and was documented. Lab parameters such as Serum creatinine, BUN, and others also whereas biomarker assessment was conducted centrally. An overview of treatment outcomes of Chronic kidney disease based on the assessment of GFR rate in each stage was estimated and submitted. The standard references like Micromedex and Lexicomp software available in the department was used. Data will be evaluated by using suitable statistical tools. Statistical Methods: Descriptive statistical analysis has been carried out in the present study. Chi-Square test has been used to find the significance of study parameters on categorical findings among different groups.

RESULTS

Table 1: Distribution of subjects according to age group.

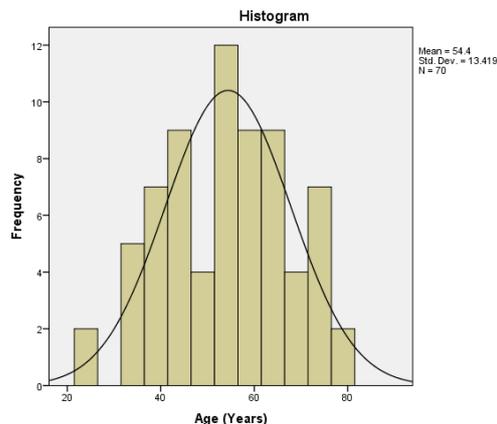| Age group	Frequency	Percent (%)
21 - 30	2	2.9
31 - 40	10	14.3
41 - 50	13	18.6
51 - 60	22	31.4
61 - 70	12	17.1
71 - 80	11	15.7
Total	**70**	**100.0**
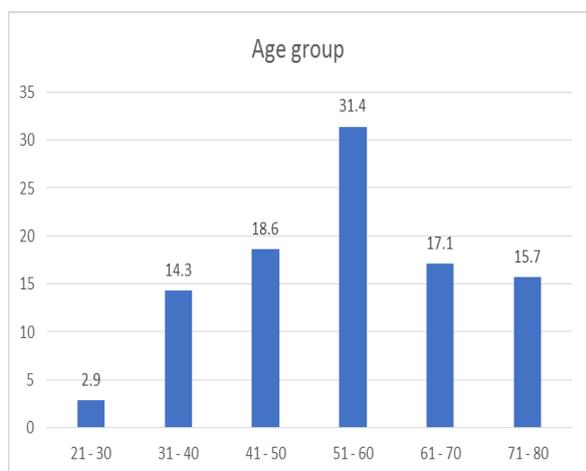
Figure 1: Distribution of subjects according to age group.

In our study, we have observed that majority of patients were identified at the age group of 51 to 60 years

22(31.4%), and mean age of study participants is 54.40, with Std. Deviation: 13.419.

Our study findings had shown that normal distribution curve with respect age of patients

Table 2: Distribution of subjects according to gender.

Gender	Frequency	Percent (%)
Female	17	24.3
Male	53	75.7
Total	**70**	**100.0**
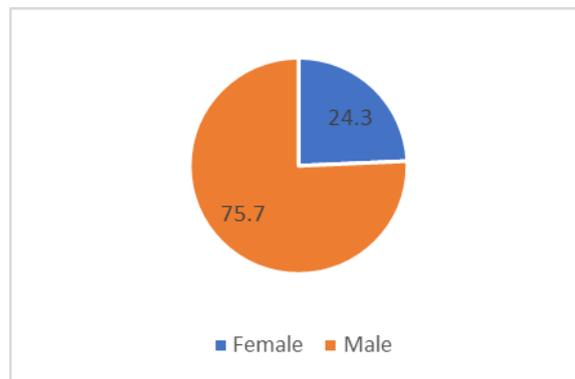
Figure 2: Distribution of subjects according to gender.

In our study, we have observed that majority of study participants were males 53(75.5%) followed by female gender which means males were more prone to get CKD than females.

Table 3: Distribution of subjects according to Risk factors.

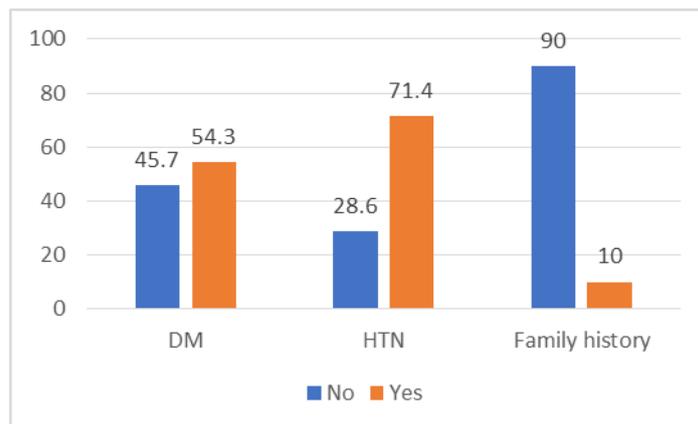|	Risk factors					
	DM		HTN		Family history	
	Frequency	Percent (%)	Frequency	Percent (%)	Frequency	Percent (%)
No	32	45.7	20	28.6	63	90.0
Yes	38	54.3	50	71.4	7	10.0
Total	**70**	**100.0**	**70**	**100.0**	**70**	**100.0**

Figure 3: Distribution of subjects according to Risk factors.

In our study, we have assessed for risk factors. We have observed that 50(71.4%) of patients were having a hypertension Followed by diabetes mellitus 38(54.3%). So which means hypertension is the major risk factor which cause CKD.

Table 4: Distribution of subjects according to CKD stage.

CKD Stages	Frequency	Percent (%)
I	1	1.4
II	2	2.9
III	7	10.0
IV	23	32.9
V	37	52.9
Total	**70**	**100.0**
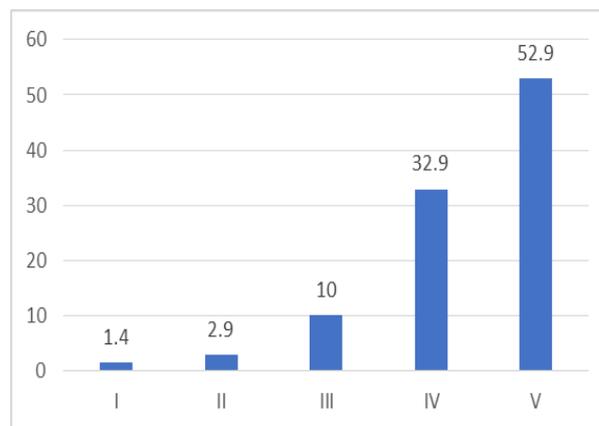
Figure 4: Distribution of subjects according to CKD stage.

In our study, majority of patients were identified at stage-V CKD 37(52.9%) followed by stage-IV CKD.

Table 5: CKD stage Vs Treatment.

Drug	CKD Stage					Total
	I	**II**	**III**	**IV**	**V**	
Acetaminophen	1	0	0	0	1	**2**
	0.3%	0.0%	0.0%	0.0%	0.3%	**0.6%**
Albuterol	0	0	0	1	0	**1**
	0.0%	0.0%	0.0%	0.3%	0.0%	**0.3%**
Amlodipine	0	0	0	1	7	**8**
	0.0%	0.0%	0.0%	0.3%	2.2%	**2.5%**
Amoxicillin	0	0	0	0	2	**2**
	0.0%	0.0%	0.0%	0.0%	0.6%	**0.6%**
Aspirin	0	0	1	3	1	**5**
	0.0%	0.0%	0.3%	1.0%	0.3%	**1.6%**
Atorvastatin	0	0	1	0	0	**1**
	0.0%	0.0%	0.3%	0.0%	0.0%	**0.3%**
Atorvastatin	0	0	0	1	1	**2**
	0.0%	0.0%	0.0%	0.3%	0.3%	**0.6%**
Azathioprine	0	0	0	0	1	**1**
	0.0%	0.0%	0.0%	0.0%	0.3%	**0.3%**
Azithromycin	0	0	0	2	2	**4**
	0.0%	0.0%	0.0%	0.6%	0.6%	**1.3%**
Budesonide	0	0	0	0	2	**2**
	0.0%	0.0%	0.0%	0.0%	0.6%	**0.6%**

Drug						
Calcitriol	0	0	0	0	1	**1**
	0.0%	0.0%	0.0%	0.0%	0.3%	**0.3%**
Calcium Carbonate	0	0	0	3	1	**4**
	0.0%	0.0%	0.0%	1.0%	0.3%	**1.3%**
Calspike	0	0	1	0	0	**1**
	0.0%	0.0%	0.3%	0.0%	0.0%	**0.3%**
Carbonyl Iron	1	0	1	2	4	**8**
	0.3%	0.0%	0.3%	0.6%	1.3%	**2.5%**
Carvedilol	0	0	0	1	1	**2**
	0.0%	0.0%	0.0%	0.3%	0.3%	**0.6%**
Cefoperazone	0	0	1	2	6	**9**
	0.0%	0.0%	0.3%	0.6%	1.9%	**2.9%**
Cefuroxime	0	0	0	0	1	**1**
	0.0%	0.0%	0.0%	0.0%	0.3%	**0.3%**
Cilnidipine	0	0	0	4	3	**7**
	0.0%	0.0%	0.0%	1.3%	1.0%	**2.2%**
Cinnarizine	0	0	0	0	1	**1**
	0.0%	0.0%	0.0%	0.0%	0.3%	**0.3%**
Clarithromycin	0	0	1	0	0	**1**
	0.0%	0.0%	0.3%	0.0%	0.0%	**0.3%**
Clindamycin	0	0	0	1	0	**1**
	0.0%	0.0%	0.0%	0.3%	0.0%	**0.3%**
Clobazam	0	0	0	0	1	**1**
	0.0%	0.0%	0.0%	0.0%	0.3%	**0.3%**
Clonidine	0	1	1	0	0	**2**
	0.0%	0.3%	0.3%	0.0%	0.0%	**0.6%**
Clonazepam	0	1	1	0	1	**3**
	0.0%	0.3%	0.3%	0.0%	0.3%	**1.0%**
Clonidine	0	0	0	1	5	**6**
	0.0%	0.0%	0.0%	0.3%	1.6%	**1.9%**
Clopidogrel	0	0	1	1	7	**9**
	0.0%	0.0%	0.3%	0.3%	2.2%	**2.9%**
Darbepoetin	0	0	0	0	1	**1**
	0.0%	0.0%	0.0%	0.0%	0.3%	**0.3%**
Diclofenac	0	0	0	1	1	**2**
	0.0%	0.0%	0.0%	0.3%	0.3%	**0.6%**
Digoxin	0	0	0	1	0	**1**
	0.0%	0.0%	0.0%	0.3%	0.0%	**0.3%**
Diphenhydramine	0	0	0	0	1	**1**
	0.0%	0.0%	0.0%	0.0%	0.3%	**0.3%**
Domperidone	0	0	1	0	0	**1**
	0.0%	0.0%	0.3%	0.0%	0.0%	**0.3%**
Doxycycline	0	0	0	2	0	**2**
	0.0%	0.0%	0.0%	0.6%	0.0%	**0.6%**
Enoxaparin	0	1	0	0	0	**1**
	0.0%	0.3%	0.0%	0.0%	0.0%	**0.3%**
Erythromycin	0	0	0	0	2	**2**
	0.0%	0.0%	0.0%	0.0%	0.6%	**0.6%**
Escitalopram	0	0	0	2	0	**2**
	0.0%	0.0%	0.0%	0.6%	0.0%	**0.6%**
Faropenem	0	0	0	1	0	**1**
	0.0%	0.0%	0.0%	0.3%	0.0%	**0.3%**
Fortamet	0	0	1	0	0	**1**
	0.0%	0.0%	0.3%	0.0%	0.0%	**0.3%**
Furosemide	1	0	3	12	24	**40**
	0.3%	0.0%	1.0%	3.8%	7.6%	**12.7%**
Glipizide	0	0	0	0	1	**1**
	0.0%	0.0%	0.0%	0.0%	0.3%	**0.3%**

Hydrocortisone Sodium	0	0	0	1	0	**1**
	0.0%	0.0%	0.0%	0.3%	0.0%	**0.3%**
Hydroxyzine	0	0	0	0	1	**1**
	0.0%	0.0%	0.0%	0.0%	0.3%	**0.3%**
Insulin	0	0	2	5	3	**10**
	0.0%	0.0%	0.6%	1.6%	1.0%	**3.2%**
Isosorbide	0	0	0	0	2	**2**
	0.0%	0.0%	0.0%	0.0%	0.6%	**0.6%**
Ketoconazole	0	1	0	0	0	**1**
	0.0%	0.3%	0.0%	0.0%	0.0%	**0.3%**
Lactulose	0	0	1	2	4	**7**
	0.0%	0.0%	0.3%	0.6%	1.3%	**2.2%**
Levonorgestrel	0	0	1	0	0	**1**
	0.0%	0.0%	0.3%	0.0%	0.0%	**0.3%**
Levothyroxine	0	0	0	1	0	**1**
	0.0%	0.0%	0.0%	0.3%	0.0%	**0.3%**
Linezolid	0	0	0	3	2	**5**
	0.0%	0.0%	0.0%	1.0%	0.6%	**1.6%**
Meropenem	0	0	0	0	1	**1**
	0.0%	0.0%	0.0%	0.0%	0.3%	**0.3%**
Metformin	0	1	0	0	0	**1**
	0.0%	0.3%	0.0%	0.0%	0.0%	**0.3%**
Methyl Prednisolone	0	0	0	0	1	**1**
	0.0%	0.0%	0.0%	0.0%	0.3%	**0.3%**
Metoclopramide	0	0	1	0	0	**1**
	0.0%	0.0%	0.3%	0.0%	0.0%	**0.3%**
Metolazone	0	0	0	1	0	**1**
	0.0%	0.0%	0.0%	0.3%	0.0%	**0.3%**
Metoprolol	0	0	1	9	6	**16**
	0.0%	0.0%	0.3%	2.9%	1.9%	**5.1%**
Metronidazole	0	0	0	1	0	**1**
	0.0%	0.0%	0.0%	0.3%	0.0%	**0.3%**
Montelukast	0	1	0	0	0	**1**
	0.0%	0.3%	0.0%	0.0%	0.0%	**0.3%**
Montelukast	0	0	0	0	1	**1**
	0.0%	0.0%	0.0%	0.0%	0.3%	**0.3%**
Moxonidine	0	0	0	0	1	**1**
	0.0%	0.0%	0.0%	0.0%	0.3%	**0.3%**
Nefrosaveforte	0	0	0	1	0	**1**
	0.0%	0.0%	0.0%	0.3%	0.0%	**0.3%**
Nephrosteril	0	0	0	0	2	**2**
	0.0%	0.0%	0.0%	0.0%	0.6%	**0.6%**
Nifedipine	0	0	0	0	5	**5**
	0.0%	0.0%	0.0%	0.0%	1.6%	**1.6%**
Nortriptyline	0	0	1	0	1	**2**
	0.0%	0.0%	0.3%	0.0%	0.3%	**0.6%**
Ondansetron	0	1	0	0	0	**1**
	0.0%	0.3%	0.0%	0.0%	0.0%	**0.3%**
Ondansetron	0	0	0	1	6	**7**
	0.0%	0.0%	0.0%	0.3%	1.9%	**2.2%**
Pantoprazole	0	0	4	12	23	**39**
	0.0%	0.0%	1.3%	3.8%	7.3%	**12.4%**
Paracetamol	0	0	1	2	0	**3**
	0.0%	0.0%	0.3%	0.6%	0.0%	**1.0%**
Pioglitazone	0	0	1	0	0	**1**
	0.0%	0.0%	0.3%	0.0%	0.0%	**0.3%**
Piperacillin	0	1	2	4	8	**15**
	0.0%	0.3%	0.6%	1.3%	2.5%	**4.8%**

Prazosin	0	0	1	3	15	**19**
	0.0%	0.0%	0.3%	1.0%	4.8%	**6.0%**
Propranolol	0	0	0	2	0	**2**
	0.0%	0.0%	0.0%	0.6%	0.0%	**0.6%**
Pyrazinamide	0	0	0	1	1	**2**
	0.0%	0.0%	0.0%	0.3%	0.3%	**0.6%**
Pyridoxine	0	0	0	1	1	**2**
	0.0%	0.0%	0.0%	0.3%	0.3%	**0.6%**
Rabeprazole	0	0	0	0	1	**1**
	0.0%	0.0%	0.0%	0.0%	0.3%	**0.3%**
Ranitidine	1	0	0	0	2	**3**
	0.3%	0.0%	0.0%	0.0%	0.6%	**1.0%**
Rifampin	0	0	0	1	1	**2**
	0.0%	0.0%	0.0%	0.3%	0.3%	**0.6%**
Sodium Bicarbonate	0	0	0	1	1	**2**
	0.0%	0.0%	0.0%	0.3%	0.3%	**0.6%**
Spironolactone	0	0	0	1	0	**1**
	0.0%	0.0%	0.0%	0.3%	0.0%	**0.3%**
Tazobactam	0	0	1	1	0	**2**
	0.0%	0.0%	0.3%	0.3%	0.0%	**0.6%**
Telmisartan	0	1	0	1	0	**2**
	0.0%	0.3%	0.0%	0.3%	0.0%	**0.6%**
Torsemide	0	0	0	4	1	**5**
	0.0%	0.0%	0.0%	1.3%	0.3%	**1.6%**
Tranexamic Acids	0	0	1	0	0	**1**
	0.0%	0.0%	0.3%	0.0%	0.0%	**0.3%**
Total	**4**	**9**	**32**	**101**	**169**	**315**
	1.3%	**2.9%**	**10.2%**	**32.1%**	**53.7%**	**100.0%**

We have observed that Furosemide is the mostly used drug for the fluid accumulation in ESRD followed stage - 4,Pantoprazole is used as second most used drug as proton pump inhibitor to balance protons.Prazosin which act as a Alpha-blocker used for the hypertension to lower the blood pressure.Human insulin is used for the Diabetes Mellitus for balancing the blood sugar levels.

Table 6: Drug interaction and its severity.

Drug Interaction Between (Index drug and Interacting drug)	Severity(Major/Moderate/Minor)			Total
	Major	**Minor**	**Moderate**	
Amlodipine & Budesonide	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Aspirin & Insulin	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Atorvastatin & Clopidogrel	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Atorvastatin & Pantoprazole	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Azithromycin & Lactulose	0	0	2	2
	0.0%	0.0%	3.2%	3.2%
Calcium Carbonate & Levothyroxine	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Carbonyl Iron & Doxycycline	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Carbonyl Iron & Pantoprazole	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Carbonyl Iron Pantoprazole	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Carvedilol & Prazosin	0	0	1	1
	0.0%	0.0%	1.6%	1.6%

Clonazepam & Telmisartan	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Clonidine & Metoprolol	4	0	0	4
	6.5%	0.0%	0.0%	6.5%
Clopidogrel & Pantoprazole	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Clopidogrel& Pantoprazole	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Diclofenac & Furosemide	1	0	0	1
	1.6%	0.0%	0.0%	1.6%
Digoxin & Metoprolol	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Enoxaparin & Telmisartan	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Erythromycin & Ondansetron	1	0	0	1
	1.6%	0.0%	0.0%	1.6%
Furosemide & Cefoperazone	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Furosemide & Clobazam	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Furosemide & Clonazepam	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Furosemide & Digoxin	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Furosemide & Hydrocortisone Sodium	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Furosemide & Hydroxyzine	0	1	0	1
	0.0%	1.6%	0.0%	1.6%
Furosemide & Insulin	0	0	4	4
	0.0%	0.0%	6.5%	6.5%
Furosemide & Lactulose	0	0	2	2
	0.0%	0.0%	3.2%	3.2%
Furosemide & Metolazone	1	0	0	1
	1.6%	0.0%	0.0%	1.6%
Furosemide & Metoprolol	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Glipizide & Insulin	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Insulin & Linezolid	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Ketoconazole & Ondansetron	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Linezolid & Escitalopram	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Metoprolol & Albuterol	1	0	0	1
	1.6%	0.0%	0.0%	1.6%
Metoprolol & Aspirin	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Metoprolol & Calcium Carbonate	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Metoprolol & Insulin	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Metoprolol & Prazosin	0	0	4	4
	0.0%	0.0%	6.5%	6.5%
Metoprolol & Torsemide	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Nifedipine & Budesonide	0	0	1	1
	0.0%	0.0%	1.6%	1.6%

Nifedipine & Clopidogrel	1	0	0	1
	1.6%	0.0%	0.0%	1.6%
Nifedipine & Methyl Prednisolone	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Pioglitazone & Insulin	1	0	0	1
	1.6%	0.0%	0.0%	1.6%
Prazosin & Aspirin	0	0	2	2
	0.0%	0.0%	3.2%	3.2%
Propranolol & Furosemide	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Pyrazinamide & Rifampin	1	0	0	1
	1.6%	0.0%	0.0%	1.6%
Ranitidine & Acetaminophen	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Rifampin & Diclofenac	0	0	1	1
	0.0%	0.0%	1.6%	1.6%
Rifampin & Isoniazid	1	0	0	1
	1.6%	0.0%	0.0%	1.6%
Sodium Bicarbonate & Carbonyl Iron	0	1	0	1
	0.0%	1.6%	0.0%	1.6%
Tranexamic Acids & Levonorgestrel	1	0	0	1
	1.6%	0.0%	0.0%	1.6%
Total	**13**	**2**	**47**	**62**
	21.0%	**3.2%**	**75.8%**	**100.0%**

The most commonly observed drug interaction is with Metoprolol which act as a beta blocker Clonidine and Prazosin which interacts moderately with Metoprolol and cause the severity.

Table 8: Distribution of subjects according to serum creatinine levels.

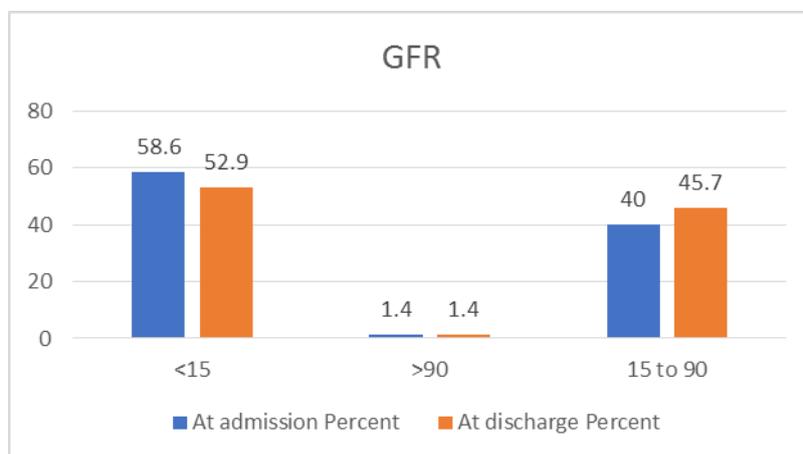| Sr.Cr mg/dl	At admission		At discharge	
	Frequency	Percent (%)	Frequency	Percent (%)
>1.35	67	95.7	65	92.9
0.7 to 1.35	3	4.3	5	7.1
Total	**70**	**100.0**	**70**	**100.0**
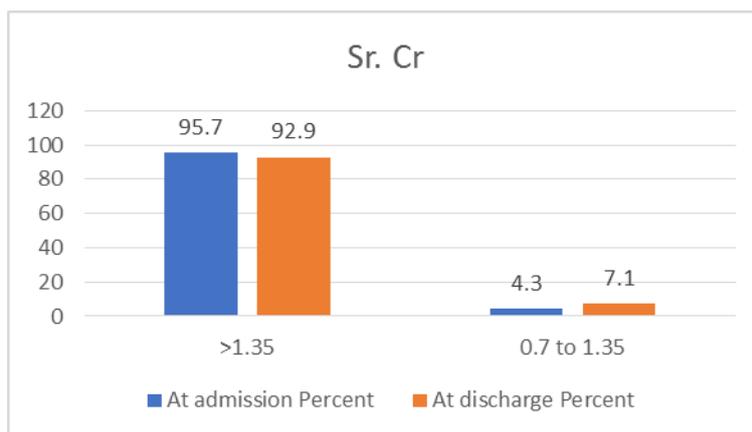
Figure 5: Distribution of subjects according to serum creatinine levels.

In our study, We have observed that 92.9% of patients having the abnormal creatinine values more than 1.35mg/dl.

In our study findings, we have observed that very less number of patients were having normal level of Sr. Cr.

And, it was identified that 5(7.1%) of patients had shown good improvement at the time of discharge.

Table 9: Distribution of subjects according to GFR.

GFR ml/min	At admission		At discharge	
	Frequency	Percent (%)	Frequency	Percent (%)
<15	41	58.6	37	52.9
>90	1	1.4	1	1.4
15 to 90	28	40.0	32	45.7
Total	**70**	**100.0**	**70**	**100.0**

Figure 6: Distribution of subjects according to GFR.

In our study, we have observed that 32(45.7%) of patients shown normal levels of GFR at the time of discharge.

Table 10: Distribution of subjects according to BUN.

BUN mg/dl	At admission		At discharge	
	Frequency	Percent (%)	Frequency	Percent (%)
<6	1	1.4	0	0
>24	62	88.6	11	15.7
6 to 24	7	10.0	59	84.3
Total	**70**	**100.0**	**70**	**100.0**
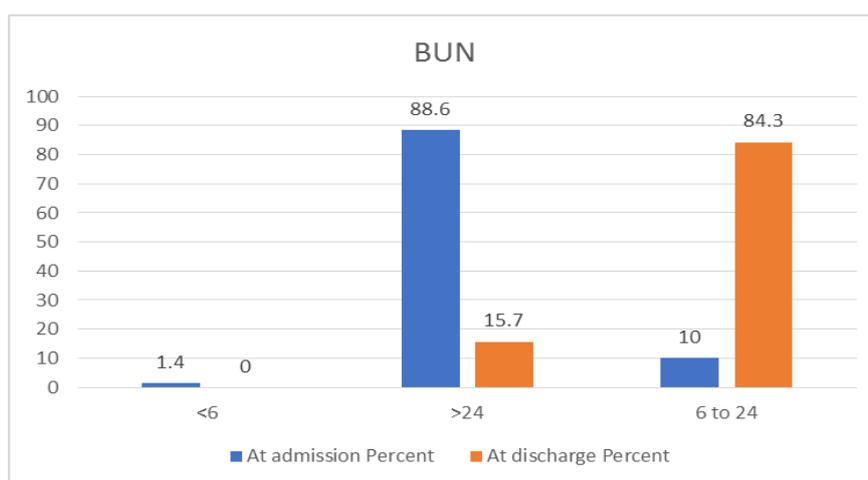
Figure 7: Distribution of subjects according to BUN.

Our study findings had shown great improvement in patients by the time of discharge. Almost 59(84.3%) of patients shown normal levels of BUN at the time of discharge.

CONCLUSION

Our study was concluded to study risk-factors and treatment outcome in each stage and find the drug interactions. The reason for the occurrence of CKD were

correlated with patients past medical history of having kidney disease in which it is mentioned the number of years the patient was suffering from disease and its causative risk factors. Patients of age groups 21-80 were considered in the study, implications such as low estimated GFR and high albuminuria, and patients with risk factors such as Hypertension, Diabetes, Proteinuria, CVD, that results progression of CKD to End Stage Renal Disease(ESRD).

Out of 5 stages of CKD most patients are in (ESRD) Stage V (52.9%) followed by Stage IV (32.9%). The treatment was based on Sr.Creatinine, GFR, BUN levels in our study we have observed that very less number of patients were having normal level of Serum Creatinine and it was identified that 7.1% of patients had shown good improvement at the time of discharge, and most of the patients have less than 15ml/min GFR value (52.9%) more than 90ml/min (1.4%), in our study we have observed that 45.7% of patients shown normal level of GFR at the time of discharge. The BUN levels is more than 24mg/dl for 15.7% of patients and have shown great improvement in BUN levels at the time of discharge 84.3%.

We have assessed that Hypertension acting as major risk factor i.e., Out of 70 patients 50 patients were identified as hypertensive, followed by 38 patients with Diabetes Mellitus. In the study we estimated that most prescribed drugs were Diuretics. In the study population patients were treated with medications such as Anti-Diabetics & Insulin therapy for DM, Alpha & Beta Adrenergic blockers for Hypertension, Diuretics incase for Fluid Accumulation(Edema). Drug interactions and its severity in out of 70 patients, 52 patients had drug interactions in which 75.8% of moderate and 3.2% minor and 21% of major.

Health care professionals must understand the risk-factors and the lab parameters which cause the CKD.

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