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A PROSPECTIVE OBSERVATIONAL STUDY TO ASSESS CHRONIC KIDNEY DISEASES ALONG WITH IT'S CO-MORBIDITIES IN A TERTIARY CARE TEACHING HOSPITAL

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ABSTRACT

Chronic Kidney Disease (CKD) is a condition characterized by gradual loss of kidney function over time, manifested by abnormal albumin excreation or decreased Kidney function, Quantified by measured or estimated glomerular filtration rate (GFR). That persists for more than three months, CKD is a world wide public health problem. **Objective:** The study aims to evaluate and carry out the prospective observational study to assess the ChronicKidney Disease (CKD) along with it's Co-morbidities. **Methodology:** A prospective observational study was carried out for three months in Department of General Medicine, VIMS, Ballari. A total of 70 case records of patients with CKD were reviewed and details such as demographics, Co-morbidities, clinical manifestations, diagnostic tests and medical procedures are recorded. The collected data were analyzed in MS Excel and statistically analyzing the results of the study. **Results:** As a result of 70 patients who met the inclusion criteria were studied, comprising 36 (51.4%) males and 34 (48.57%) females. The majority of patients were in the age group of 46 – 60 (41.4%). Most of the patients according to Co-morbidities were seen in hypertension (39.25%). The majority of patients based on clinical manifestations were found with Breathlessness 34 patients (23.6%) followed by edema were 19 patients (13.19%). Out of 70 patients based on medical procedures were seen in 40 patients (57.14%) with Dialysis and 30 (42.85%) with Non-Dialysis. Most of the patients according to diagnostic test based on Serum creatinine values

are 5.0 – 10 mg/dl are 34 (48.57%) and based on Blood urea values are Above 100 mg/dl are 48 (68.57%) patients. **Conclusion:** In our study found that prevalence of CKD was most affected in the age group 46 – 60 and common Co-morbidities observed in the study were Hypertension and Diabetes mellitus. Pharmacist plays a major role in hospital by providing services such as patient education, disease counseling, assessment of risk factors and detection of CKD in early stages, creating awareness in the public and health care workers therefore improve quality of life among the CKD patients.

KEYWORDS: Chronic Kidney Disease, Glomerular filtration rate(GFR), C0-morbidity, Hypertension, Dialysis, Disease counselling, Awareness, Quality of life.

INTRODUCTION

Kidneys are vital organs they are bean shaped, located on either side of spine they are the most important part of urinary tract. Nephron is a functional unit of kidney, which involves blood filtration, Reabsorption of water and other essential molecules from the Glomerular qfiltrate.[1]

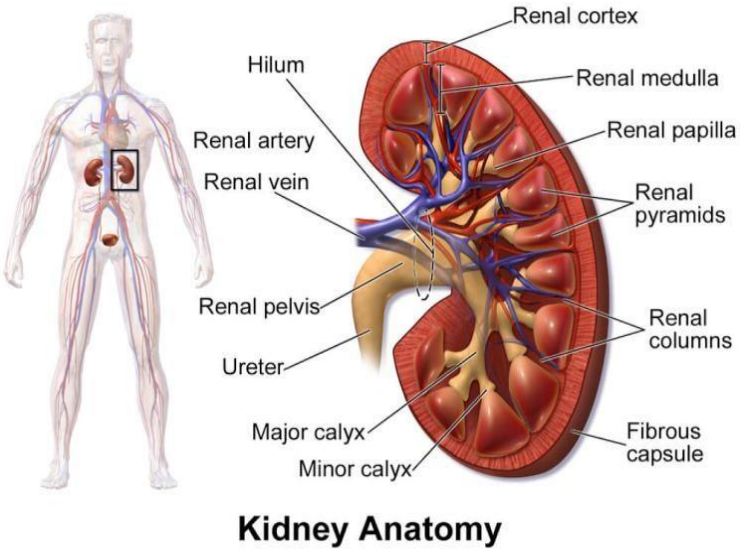

Fig. 1: Anatomy of Kidney.

Introduction to CKD

Chronic kidney disease (CKD) is a condition characterized by gradual loss of kidney function over time, manifested by abnormal albumin excretion or decreased kidney function, quantified by measured or estimated glomerular filtration rate (GFR), that persists for more than three months. Chronic kidney disease (CKD) is a worldwide public health problem.[2]

Stages of GFR

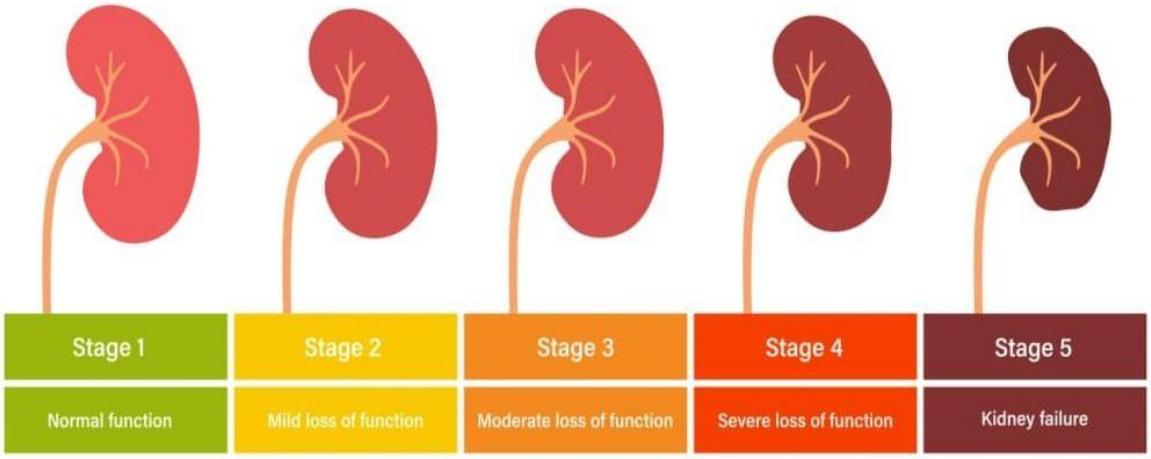

Fig. 2: Stages of GFR.

Table 1: KDIGO Staging for CKD.[3]

Gfr stages	Gfr Levels	Descriptions
1	> 90 ml/min	Normal or High
2	60-89 ml/min	Mildly decreased
3A	45-59 ml/min	Mildly to Moderately decreased
3B	30-44 ml/min	Moderately to Severely decreased
4	15-29 ml/min	Severely decreased
5	< 15 ml/min	End stage renal disease

Epidemiology

CKD affected 753 million people globally in 2016 including 417 million females and 336 million males.[4]

Etiology

Diabetic nephropathy (Type 1 & Type 2), Hypertension, Glomerulonephritis, Vasculitis, Toxins: Excessive use of medications that are excreted through kidneys, Recurrent phelonephritis (kidney infection), Autosomal dominant polycystic kidney disease, Vasicoureteral reflux: a condition that causes urine to backup into kidney, Other cystic and tubulointerstitial nephropathy.[4]

Pathogenesis of chronic kidney disease[5]

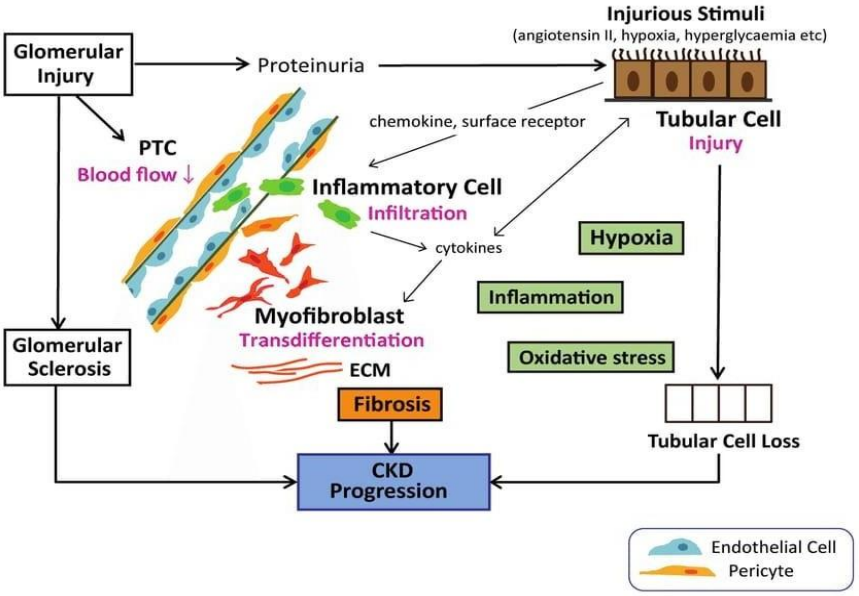

Fig. 3: Pathogenesis of Chronic Kidney Disease.

Clinical Manifestation[6]

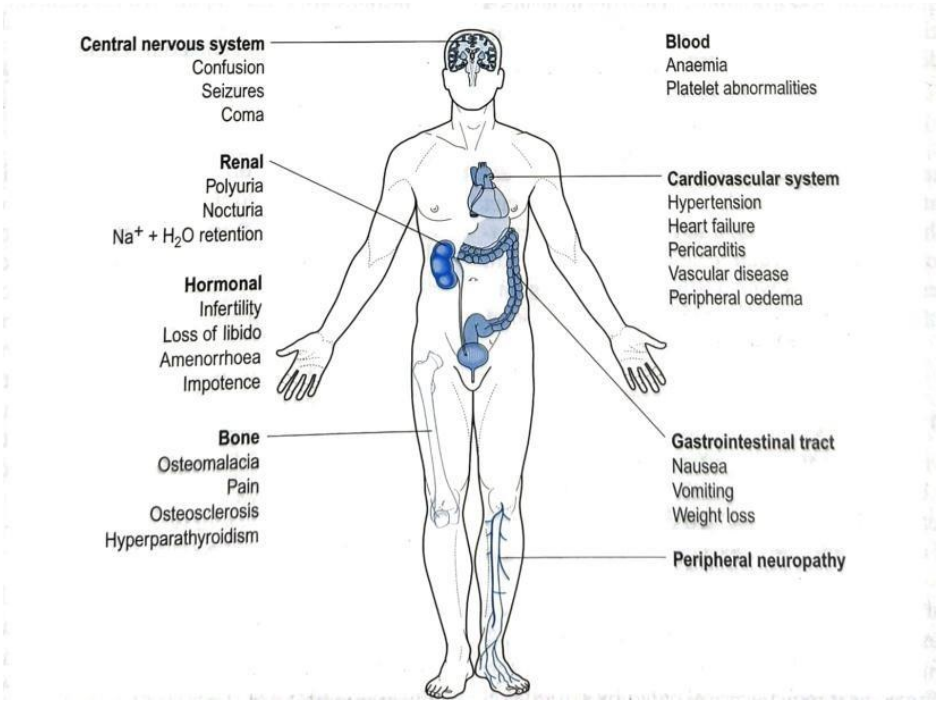

Fig. 4: Medical Signs and Symptoms of CKD.

Risk factors

Small for gestation birth weight, Childhood obesity, Hypertension, Diabetes mellitus, Autoimmune disease, Previous episodes of AKI, Presence of proteinuria, Abnormal urinary sediment, Structural abnormalities of urinary tract, Consumption of alcohol and smoking.[4]

Co-morbid conditions

Diabetes, Hypertension, Anemia, Hypercholesterolemia, Tuberculosis, HIV, CVA.[7]

Diagnostic tests

Serum creatinine test, Blood urea nitrogen (BUN) test, Urinary albumin test, Glomerular, filtration rate (GFR), Imaging tests(X-ray, Magnetic resonance imaging, Computed tomography), Kidney biopsy.[8]

Treatment

There's no cure for chronic kidney disease (CKD), but treatment can help relieve the symptoms and stop it getting worse.

The main treatments are

- **Medicine:** To control associated problems, such as High blood pressure and High cholesterol
- **Dialysis treatment:** To replicate some of the kidney's functions, which may necessary in advanced (stage 5) CKD
- **Kidney transplant:** This may also be necessary in advanced (stage 5) CKD.[8]

Life style modifications

Control BP, Manage diabetes, Balanced diet, Consume fruits and vegetables, Exercise regularly, Intake of water as prescribed by physician, Avoid smoking, Avoid alcohol consumption.[8]

METHODOLOGY

A prospective observational study was conducted among 70 CKD patients in the Department of General Medicine, VIMS, Ballari. Over 3 months, IEC Committee of TVM college of pharmacy approved the study, A specially designed profoma was used for collecting data which includes patient demographics, personal history, comorbidities, diagnosis, dialysis report, present medications prescribed for each patient. The data were obtained by interviewing the patient and /or caretakers and from patient profiles. The study was carried out by considering specific inclusion and exclusion criteria mentioned below.

Inclusion criteria	Exclusion criteria
Age >18 years of both male and femalepatients.	Age <18 years.
Inpatients.	Out patients.
All patients diagnosed with CKD.	Pregnant women with CKD.
Patient who are willing to sign the informed consent form.	Patients who are not willing to sign theInformed consent form.

Materials used

1. Data Collection Form.
2. Informed Consent Form.
3. Patient Counselling Form.
4. Educating Patients by Providing Patient Information Leaflet.

Data analysis: Data was analyzed in MS Excel and descriptive statistics was used for analyzing the result of the study.

RESULTS

This study recruited 70 CKD patients after getting an informed consent form based on Inclusion and Exclusion criteria. The demographic details and other medical procedures were collected in the suitable data collecting form. The filled forms were analyzed for the observational study to assess CKD along with it's Co-morbidities. Obtained results were analyzed by using Microsoft Excel.

A Prospective Observational Study was conducted among the Inpatients of Vijayanagara Institute of Medical Scinces, Ballari, Karnataka.

Table 2: Distribution of patients according to age.

Sl. No.	Age	Number of patients	Percentage
1.	18-30	9	12.85%
2.	31-45	17	24.28%
3.	46-60	29	41.4%
4.	61-75	13	18.57%
5.	76-90	2	2.85%

Out of 70 patients the highest age group people are 46-60 (41.4%), followed by 31-45 (24.2%), 61-75 (18.57%), 18-30 (12.85%) and 76-90 (2.85%).

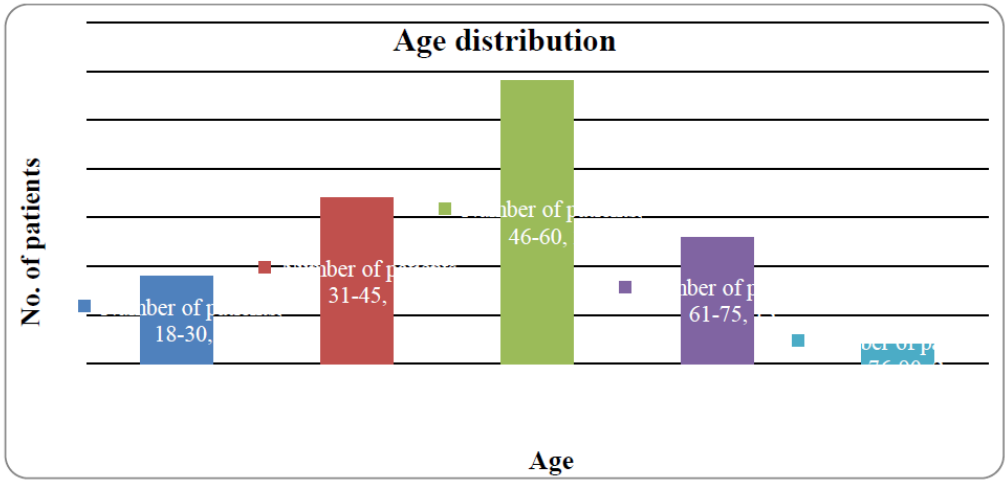

Fig. 5: Distribution of patients according to age.

Table 3: Distribution of patient according to gender.

Sl. No.	Gender	Number of patients	Percentage
1.	Male	36	51.4%
2.	Female	34	48.57%

Out of 70 patients (36) 51.4% were males and (34) 48.57% were females.

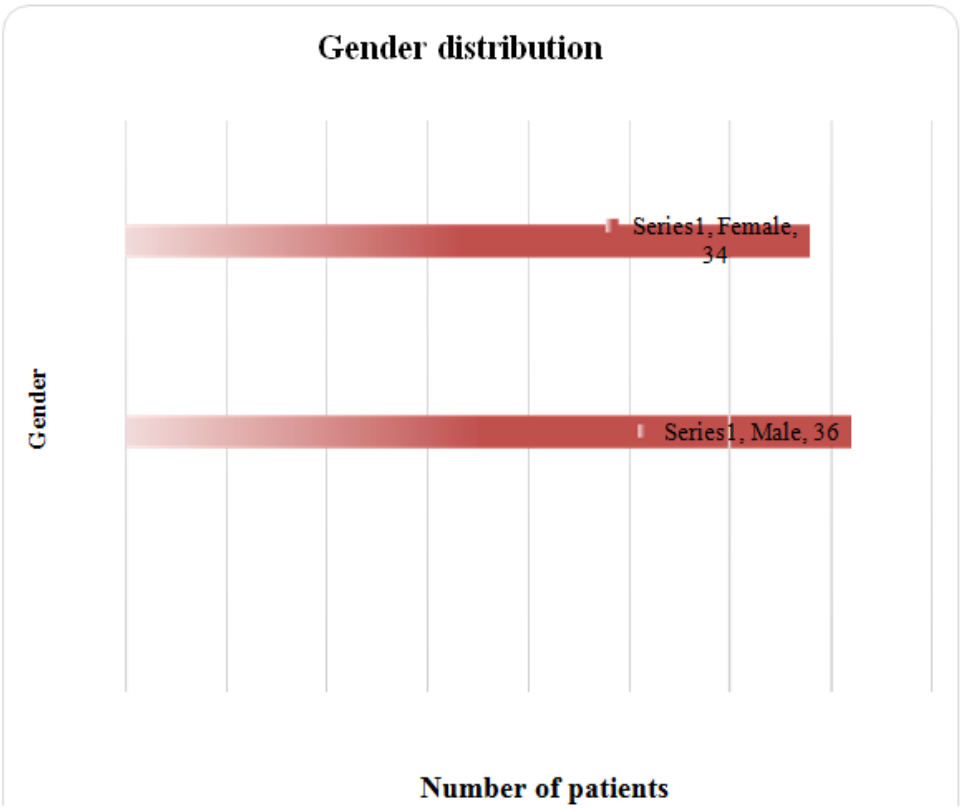

Fig. 6: Distribution of patients according to gender.

Table 4: Distribution of patients according to Co-morbidities.

Sl. No.	Co-morbid condition	Male	Female	Total no ofpatients	Total percentage
1.	Hypertension	24	18	42	39.25%
2.	Diabetes mellitus	11	7	18	16.82%
3.	CVA	2	1	3	2.80%
4.	P. Tuberculosis	2	4	6	5.60%
5.	Anemia	0	3	3	2.80%
6.	Others	6	7	13	12.14%
7.	No co-morbid	12	10	22	20.56%
8.	Total	57	50	107	100%

Note: Others Includes IHD, Hypocalcemia, Nephritic Syndrome, Hypothyroidism, Uremic Encphelopathy, LVF, CVA, P. TB, RHD, IDV (HIV-I), Nephritis, Pancreatitis, Cardiac Stroke, Renal Amyloidosis.

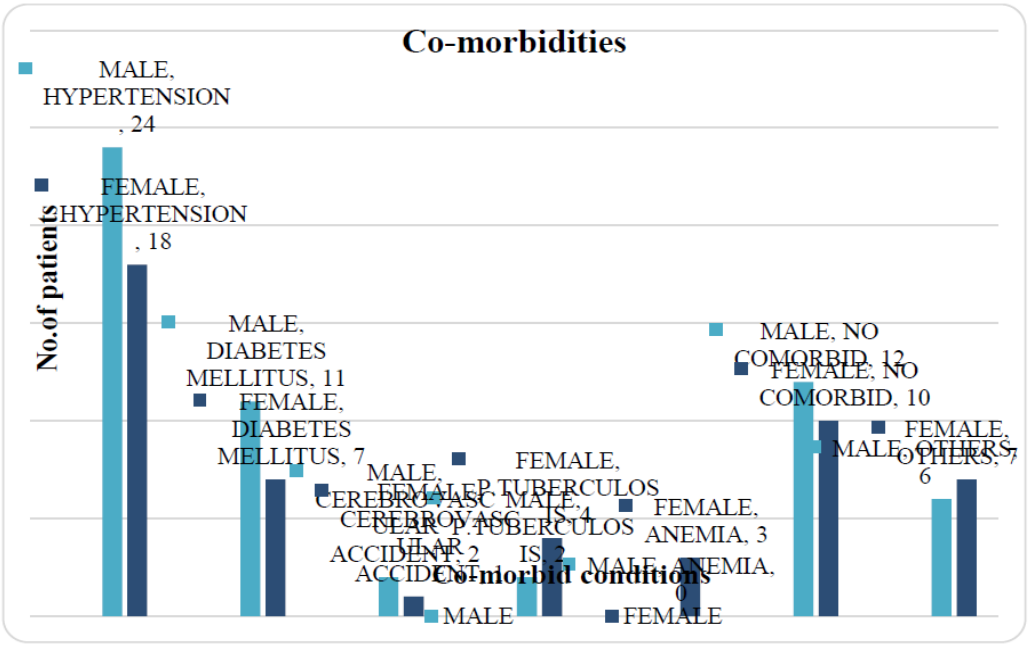

Fig. 7: Distribution of patients according to Co-morbidities.

Table 5: Distribution of patients according to clinical manifestation.

Sl. No.	Clinical Manifestations	Number of Patients	Percentage
1.	Altered Sensorium	7	4.86%
2.	Breathlessness	34	23.61%
3.	Chest pain	9	6.25%
4.	Chills	4	2.77%
5.	Cough	10	6.94%
6.	Edema	19	13.19%
7.	Fever	16	11.11%
8.	Reduced urine output	9	6.25%
9.	Vomiting	9	6.25%

10.	Weakness	4	2.77%
11.	Others	23	15.97%
12.	Total	144	100%

Out of 70 patients, 34 patients (23.61%) found with breathlessness, 19 patients (13.19%) found with edema, 16 patients (11.11%) found with fever, 10 patients (6.94%) found with cough, 9 patients (6.25%) found with chest pain, 9 patients (6.25%) were found with reduced urine output, 9 patients (6.25%) were found with vomiting, 7 patients (4.86%) were found with altered sensorium, 4 patients (2.77%) were found with chills and 4 patients (2.77%) were found with weakness and others were also found in 23 patients (15.97%).

Note: Others include facial puffiness, burning, maturation, loss of appetite, abdominal pain, loose stools, lower limb pain, giddiness, seizures and back pain.

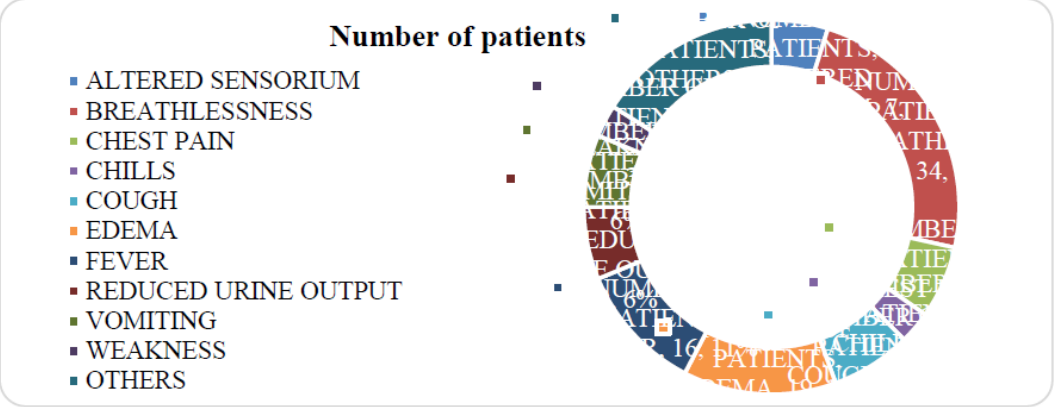

Fig. 8: Distribution of patients according to clinical manifestations.

Distribution of patients according to diagnostic tests

A. Serum creatinine

Table 6: Distribution of patients according to diagnostic test; Serum creatinine.

Sl. No	Values	Number ofpatients	Percentage
1.	0.6-1.4	4	5.71%
2.	1.5-5.0	20	28.57%
3.	5.0-10	34	48.57%
4.	Above 10	12	17.14%
5.	Total	70	100%

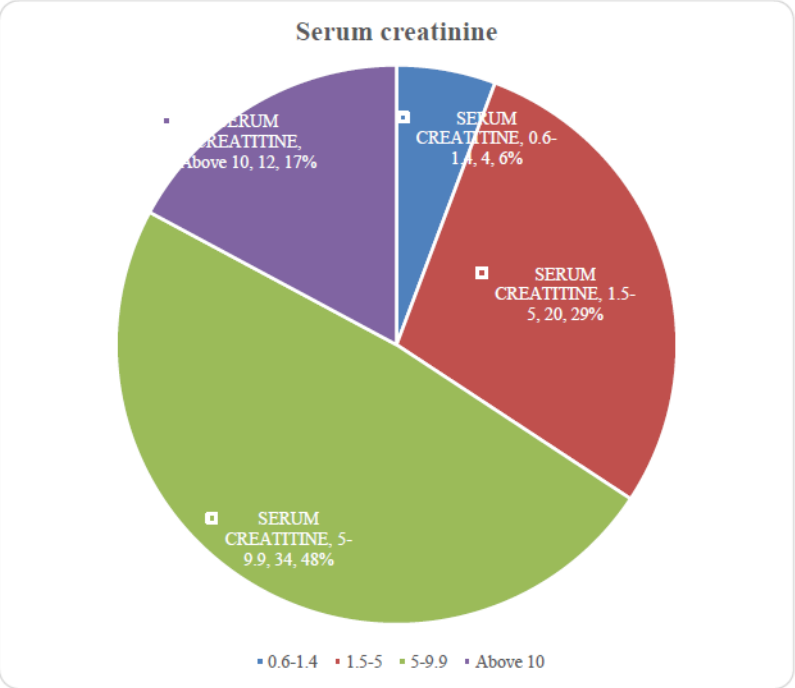

Fig. 9: Distribution of patients according to diagnostic test; Serum creatinine.

B. Blood urea

Table 7: Distribution of patients according to diagnostic test; Blood urea.

Sl. No.	Values	Number ofPatients	Percentage
1.	20-50	3	4.28%
2.	60-100	19	27.14%
3.	Above 100	48	68.57%
4.	Total	70	100%

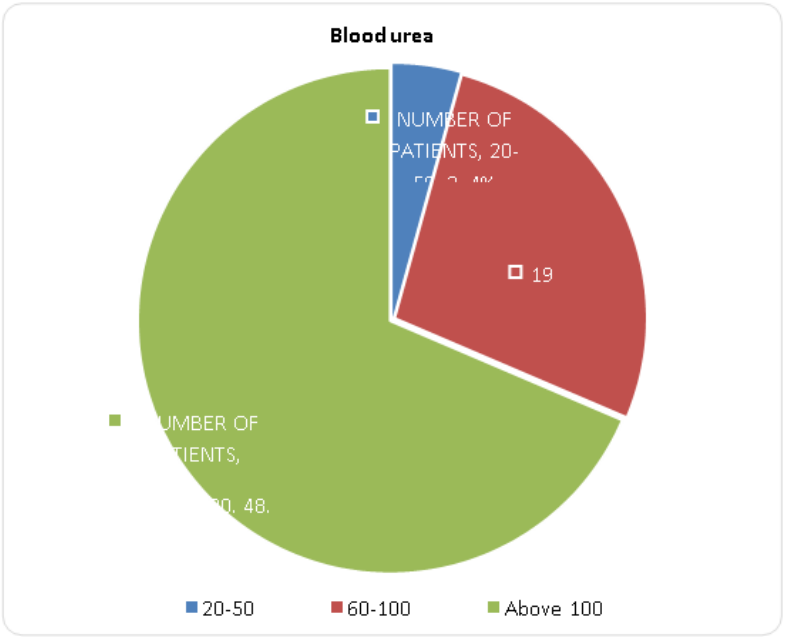

Fig. 10: Distribution of patients according to diagnostic test; Blood urea.

Table 8: Distribution of patients according to counselling provided.

Sl. No.	Counselling Provided	Number of Patients	Percentage
1.	Patient	43	61.42%
2.	Patient Representative	27	38.58%
3.	Total	70	100%

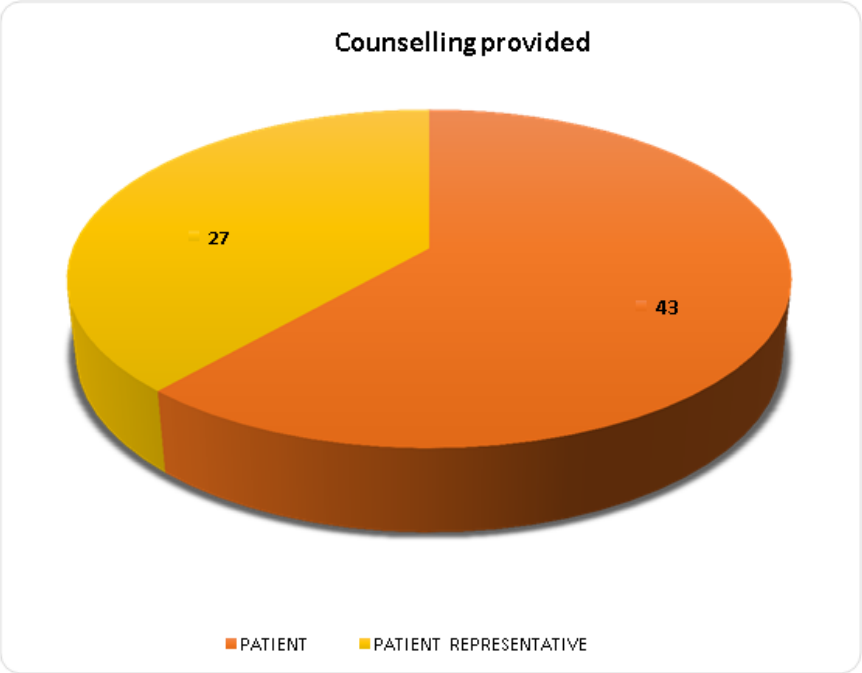

Fig. 11: Distribution of patients according to counselling provided.

Table 9: Distribution of patients according to medical procedure.

Sl. No.	Medical Procedures	Number of patients	Percentage
1.	Dialysis	40	57.14%
2.	Non dialysis	30	42.85%

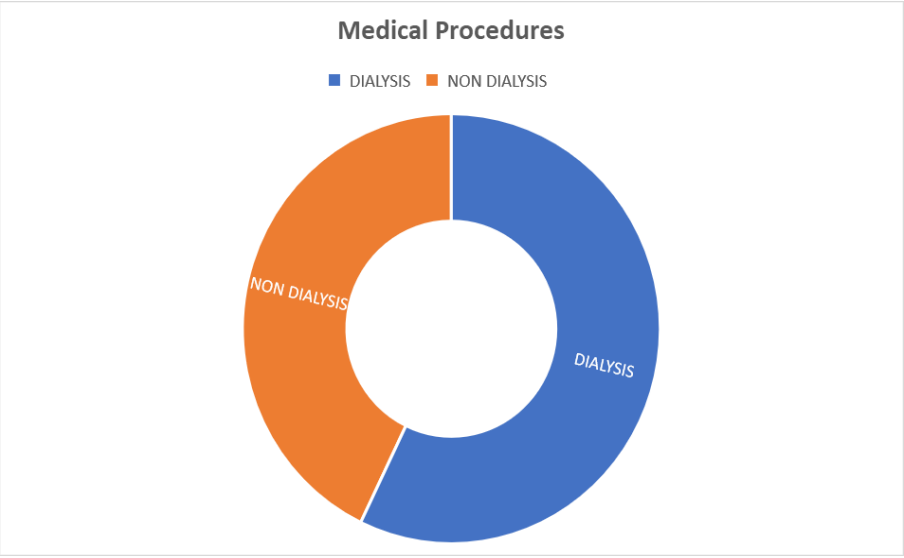

Fig. 12: Distribution of patients according to medical procedure.

DISCUSSION

In the present study to assess CKD patients along with its Co-morbidities in a tertiary care teaching hospital. The study highlights the pattern of Co-morbid condition in CKD. Patients and assessment of clinical manifestations and diagnostic tests.

- A total of 70 patients who satisfied inclusion criteria were enrolled for the study Among the study subjects of 70 CKD patients, 36 patients (51.4%) were males and 34 patients (48.57%) were females as shown in the figure 6.
- In the current study out of 70 patients the highest age group of patients having CKD were observed are 46-60 (41.4%) followed by 31-45 (24.28%), 61-75 (18.57%), 18- 30 (12.85%) and 76-90 (2.85%) age group people are respectively as shown in the figure 5.
- In the present study the most frequent risk and Co-morbidity were found to be Hypertension (39.2%), Diabetes mellitus (16.8%), others like Hypocalcemia, Nephrotic syndrome, Hypothyroidism, Uremic encephalopathy, LVF, Rheumaticheart disease, IDV (HIV-1), Nephritis, Pancreatitis and Renal amydosis. (12.14%), Pulmonary Tuberculosis (5.6%), Anemia (2.8%), Cerebrovascular accident (2.8%) and No Co-morbidity patients are 20.5% were identified during this study as shown in figure 7.
- In the current study distribution of patients according to clinical manifestations are out of 70 patients 34 patients (23.61%) found with breathlessness, 19 patients (13.19%) found with edema, 16 patients (11.11%) found with fever, 10 patients (6.94%) found with cough, 9 patients (6.25%) found with chest pain, 9 patients (6.25%) were found with reduced urine output, 9 patients (6.25%) were found with vomiting, 7 patients (4.86%) found with altered sensorium, 4 patients(2.77%) found with chills and weakness, and 23 patients (15.9%) found with other clinical manifestations like facial puffiness, burning and maturation, loss of appetite, abdominal pain, loose stools, lower limb pain, giddiness, seizures and back pain as shown in figure 8.
- In this present study the laboratory values were also analysed. The highest number of patients reported with serum creatinine 5-10 (48.5%) followed by 1.5-5.0 (28.5%), above 10 (17.14%) and 0.6 to 1.4 (5.7%) (normal) were found as shown in figure 9. Blood urea were also analysed the highest number of patients found with above 100 (68.57%) followed by 60 -100 (27.14%) and 20-50 (4.28%) were reported as shown in figure 10.
- In the present study, performed educating the patients about CKD and improved patient knowledge regarding the disease by providing counselling to them. Out of 70 patients counselling provided to patients (43) are 61.42% and counselling provided to patients representative (27) are 38.5% as shown in fig 11.

- In the present study, distribution of patients according to medical procedures were also observed, are Dialysis performed in 40 patients (57.14%) and Non-Dialysis performed in 30 patients (42.85%) respectively as shown in figure 12.

CONCLUSION

In this study 'A Prospective Observational Study to assess CKD along with its Co-morbidities in a tertiary care teaching hospital'. It was found that males were more prone to advanced CKD than females. The most common Co-morbidities observed in this study population were Hypertension and Diabetes Mellitus. We found that prevalence of CKD was most affected in the age group of 46-60 and 31-45 age group people.

In this study we performed educational programs to the patient about CKD and improved patient knowledge regarding the disease by providing counselling to the patient and their patient representatives and distributed patient information leaflets. Pharmacists play a major role in hospital by providing services such as patient education, disease counselling, assessment of risk factors and detection of CKD in early stages. Creating the awareness in the public and health care workers may decrease the prevalence, economic burden, hospital stay and reduce the disease progression therefore improve quality of life among CKD patients.

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AUTHOR'S CONTRIBUTION

All the authors have contributed equally.

CONFLICT OF INTEREST

All the authors declare no conflict of interest.

ETHICS DECLARATION

The protocol was verified by the Institutional Ethics committee of TVM College of pharmacy. Informed consent form was obtained from all the residence in the hospital.

CONSENT FOR PUBLICATION

The authors have given their consent for publication.

COMPETING INTERESTS

The authors declare that they have no competing interests.

AUTHORS FUNDING

The authors hereby declare that no financial support was taken from anyone for research, authorship and for publication of this article.

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