

A Clinical Profile Of Epidemiology, Etiology And Drug Utilization Review On Chronic Kidney Disease.

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Abstract

Background: Chronic kidney disease (CKD), previously termed chronic renal failure, refers to an irreversible deterioration in renal function which usually develops over a period of years.

Aim : To access the clinical profile with reference to the Epidemiology, Etiology of the condition, the management and review of the Drug utilization.

Objectives : To access the clinical profile with reference to the Epidemiology and Etiology of the chronic kidney disease. To access the serum creatinine and GFR values of the condition. To Monitor the DUR on drugs used in the treatment of chronic kidney disease.

Methodology: The data from medical records of all the cases of chronic kidney disease admitted in the department of nephrology GGH, KURNOL. Over the study period of 3 months were assessed and documented further study. The patients were selected based on inclusion and exclusion criteria.

Results: Total distribution of patients with age group shows that high number of patients were under the age 51-60 than other age groups. In our study, percentage population showed that 41 (82%) patients were males and 9 (18%) patients were females. In our study, majority of the CKD Patients were involved in Urban area 19(62%), followed by Rural area 19(38%). Among the 50 patients, we observed 26 (52%) patients were with hypertension and 14 (28%) were with hypertension along with diabetes.

Conclusion: In our study the majorly observed risk factors were Hypertension and Diabetes, so the health care professionals should have to conduct the Awareness programme as much as possible which helps in enhancement of the patient's quality of life. Finally we conclude that proper risk factors management (HTN, DM) and following the guidelines in the treatment reduces the severity of the Disease and their prognostic factor shows the good result.

Keywords: Chronic Kidney Disease, Hypertension, Diabetes, Epidemiology, Etiology Drug Utilization Review.

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I. Introduction

DEFINITION

Chronic kidney disease (CKD), previously termed chronic renal failure, refers to an irreversible deterioration in renal function which usually develops over a period of years. Initially, it is manifest only as a biochemical abnormality but, eventually, loss of the excretory, metabolic and endocrine functions of the kidney leads to the clinical symptoms and signs of renal failure, collectively referred to as uraemia. When death is likely without RRT (CKD stage 5), it is called end-stage renal disease or failure (ESRD or ESRF).¹

Classification of the stages of chronic kidney disease^{1,2}

STAGE	GFR (ml/min/1.73m ²)	DESCRIPTION
I	>90	Minimal kidney damage
II	60-89	Kidney damage with mild reduction of GFR
III A	45-59	Moderate reduction of GFR
III B	30-44	Moderate reduction of GFR
IV	15-29	Severe reduction of GFR
V	<15 OR on dialysis	End- stage renal disease

EPIDEMIOLOGY¹

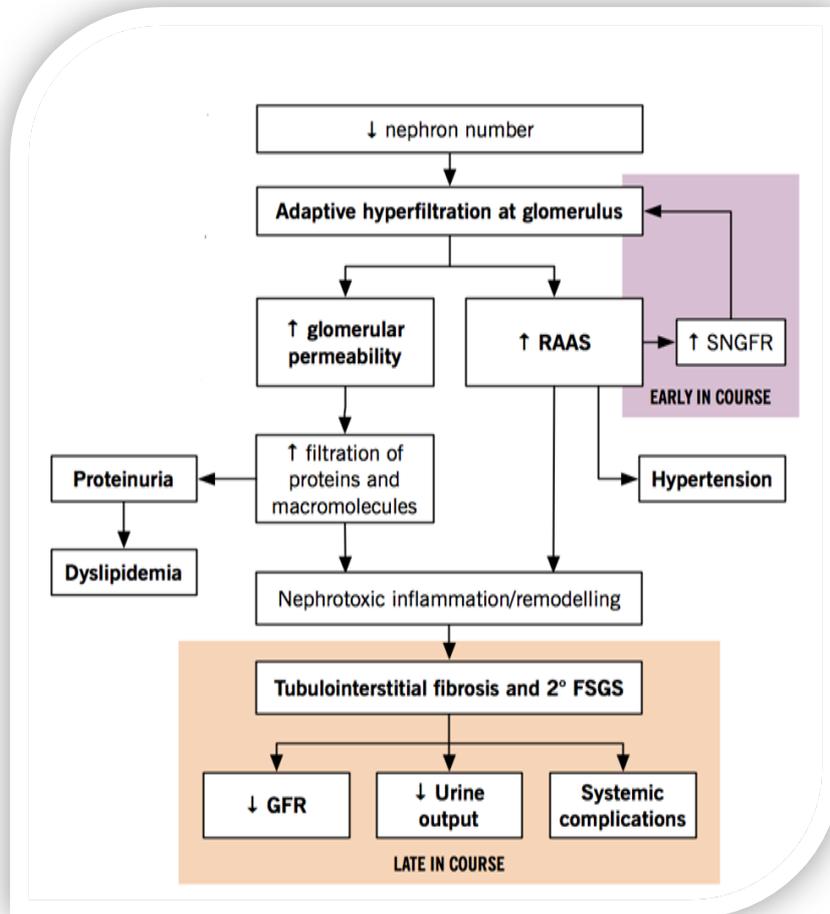
The social and economic consequences of CKD are considerable. In most countries, estimates of the prevalence of CKD stage 3–5 (eGFR < 60) are around 5-7%, mostly affecting people aged 65 years and above. The prevalence of CKD in hypertension, diabetes and vascular disease is substantially higher, and targeted

screening for CKD should be considered in these and other high-risk groups. The great majority of patients with earlier CKD (stages 1–3) never develop ESRD, which is fortunate.

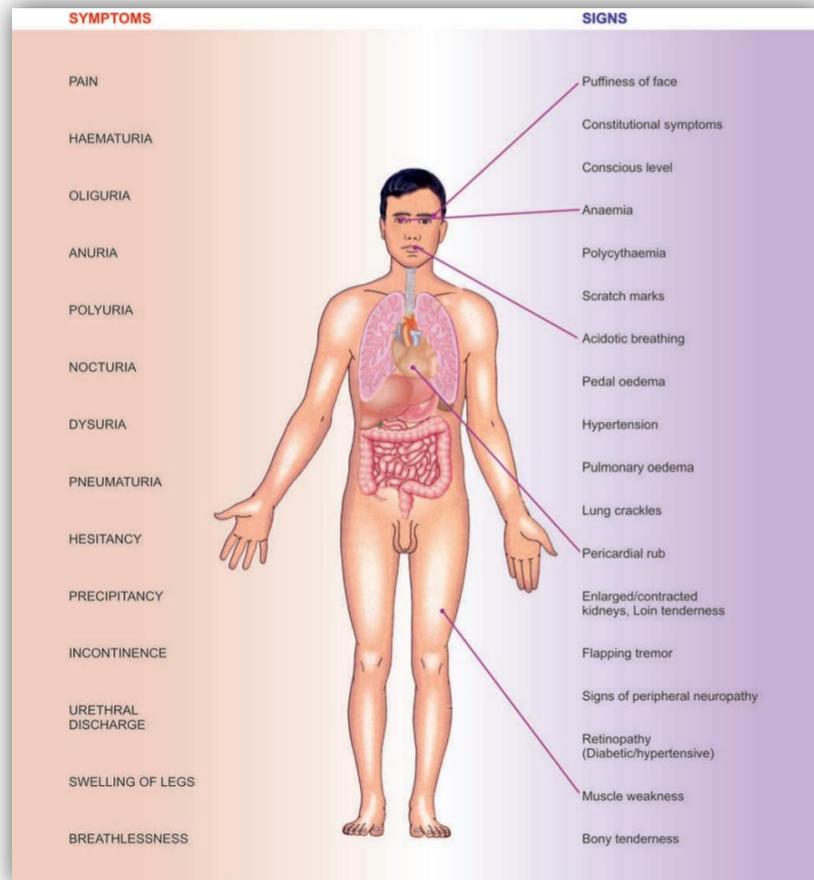
ETIOLOGY³

- Diabetes
- Hypertension
- Glomerular disorders
- Underlying Renal diseases
- Auto immune disease
- Polycystic kidney disease
- Other
- Infections
- Obstructive uropathy
- Interstitial diseases

PATHOPHYSIOLOGY⁴



CLINICAL MANIFESTATIONS^{5,6,7}



DIAGNOSIS⁸

For kidney disease diagnosis, may also need certain tests and procedures, such as:

- **Blood tests.** Kidney function tests look for the level of waste products, such as creatinine and urea, in blood.
- **Urine tests.** Analyzing a sample of urine may reveal abnormalities that point to chronic kidney failure and help identify the cause of chronic kidney disease.
- **Imaging tests.** It may use ultrasound to assess kidneys' structure and size. Other imaging tests may be used in some cases.
- **Removing a sample of kidney tissue for testing.** It may recommend a kidney biopsy to remove a sample of kidney tissue. Kidney biopsy is often done with local anesthesia using a long, thin needle that's inserted through skin and into kidney. The biopsy sample is sent to a lab for testing to help determine what's causing kidney problem.

TREATMENT⁸

- **High blood pressure medications.** People with kidney disease may experience worsening high blood pressure. Your doctor may recommend medications to lower your blood pressure — commonly angiotensin-converting enzyme (ACE) inhibitors or angiotensin II receptor blockers — and to preserve kidney function. High blood pressure medications can initially decrease kidney function and change electrolyte levels, so you may need frequent blood tests to monitor your condition. Your doctor will likely also recommend a water pill (diuretic) and a low-salt diet.
- **Medications to lower cholesterol levels.** Your doctor may recommend medications called statins to lower your cholesterol. People with chronic kidney disease often experience high levels of bad cholesterol, which can increase the risk of heart disease.
- **Medications to treat anemia.** In certain situations, your doctor may recommend supplements of the hormone erythropoietin (uh-rith-roe-POI-uh-tin), sometimes with added iron. Erythropoietin supplements aid in production of more red blood cells, which may relieve fatigue and weakness associated with anemia.

- **Medications to relieve swelling.** People with chronic kidney disease may retain fluids. This can lead to swelling in the legs, as well as high blood pressure. Medications called diuretics can help maintain the balance of fluids in your body.
- **Medications to protect your bones.** Your doctor may prescribe calcium and vitamin D supplements to prevent weak bones and lower your risk of fracture. You may also take medication known as a phosphate binder to lower the amount of phosphate in your blood, and protect your blood vessels from damage by calcium deposits (calcification).
- **A lower protein diet to minimize waste products in your blood.** As your body processes protein from foods, it creates waste products that your kidneys must filter from your blood. To reduce the amount of work your kidneys must do, your doctor may recommend eating less protein. Your doctor may also ask you to meet with a dietitian who can suggest ways to lower your protein intake while still eating a healthy diet.

Treatment for end-stage kidney disease

If your kidneys can't keep up with waste and fluid clearance on their own and you develop complete or near-complete kidney failure, you have end-stage kidney disease. At that point, you need dialysis or a kidney transplant.

- **Dialysis.** Dialysis artificially removes waste products and extra fluid from your blood when your kidneys can no longer do this. In hemodialysis, a machine filters waste and excess fluids from your blood. In peritoneal dialysis, a thin tube (catheter) inserted into your abdomen fills your abdominal cavity with a dialysis solution that absorbs waste and excess fluids. After a period of time, the dialysis solution drains from your body, carrying the waste with it.
- **Kidney transplant.** A kidney transplant involves surgically placing a healthy kidney from a donor into your body. Transplanted kidneys can come from deceased or living donors. You'll need to take medications for the rest of your life to keep your body from rejecting the new organ. You don't need to be on dialysis to have a kidney transplant.

For some who choose not to have dialysis or a kidney transplant, a third option is to treat kidney failure with conservative measures. However, once you have complete kidney failure, your life expectancy generally would be only a few months.

II. Literature Review

1. Ajay K Singh, et al was conducted a study,(2013) on "Epidemiology and risk factors of chronic kidney disease in India – results from the SEEK (Screening and Early Evaluation of Kidney Disease) study". There is a rising incidence of chronic kidney disease that is likely to pose major problems for both healthcare and the economy in future years. We cross-sectionally screened 6120 Indian subjects from 13 academic and private medical centers all over India. Blood and urine samples were collected. The total cohort included in this analysis is 5588 subjects. The mean \pm SD age of all participants was 45.22 ± 15.2 years (range 18–98 years) and 55.1% of them were males and 44.9% were females. The overall prevalence of CKD in the SEEK-India cohort was 17.2% with a mean eGFR of 84.27 ± 76.46 versus 116.94 ± 44.65 mL/min/1.73 m² in non-CKD group while 79.5% in the CKD group had proteinuria. Prevalence of CKD stages 1, 2, 3, 4 and 5 was 7%, 4.3%, 4.3%, 0.8% and 0.8%, respectively. The prevalence of CKD was observed to be 17.2% with ~6% have CKD stage 3 or worse.

2. Muhammad Salman et al was conducted a study (2015) on "Attributable causes of chronic kidney disease in adults: a five-year retrospective study in a tertiary-care hospital in the northeast of the Malaysian Peninsula". A total of 851 eligible cases were included. The patients' mean age was 61.18 ± 13.37 years. CKD stage V was found in 333 cases (39.1%) whereas stages IV, IIIb, IIIa, and II were seen in 240 (28.2%), 186 (21.9%), 74 (8.7%) and 18 (2.1%), respectively. The percentage of CKD stage V patients receiving renal replacement therapy was 15.6%. The foremost attributable causes of CKD were diabetic nephropathy (DN) (44.9%), hypertension (HPT) (24.2%) and obstructive uropathy (9.2%). The difference in the prevalence of CKD due to DN, HPT and glomerulonephritis between patients ≤ 50 and > 50 years old was statistically significant.

3. Dorothy A. Thomas, et al was conducted "A Retrospective Study of Chronic Kidney Disease Burden in Saskatchewan's First Nations People". We aimed to identify the severity of chronic kidney disease and quantify the geographical challenges of obtaining kidney care by Saskatchewan first national people. This study is a retrospective analysis of the provincial electronic medical record clinical database from January 2012 to December 2013. The patients included 2478 individuals (379 First Nations and 2099 non-First Nations) who were older than 18 years old, resident in Saskatchewan, and followed by the provincial chronic kidney care program. First Nations demonstrate a higher proportion of end-stage renal disease (First Nations = 33.0% vs non-First Nations = 21.4%, $P < .001$), earlier onset of chronic kidney disease (M FN = 56.4 years, SD = 15.1; M NFN = 70.6 years, SD = 14.7, $P < .001$), and higher rates of end-stage renal disease secondary to type 2 diabetes (First Nations = 66.1% vs non-First Nations = 39.0%, $P < .001$). First Nations people are also more likely to be on dialysis (First Nations = 69.7% vs non-First Nations = 40.2%, $P < .001$), use home-based therapies less frequently (First Nations = 16.2% vs non-First Nations = 25.7%; $P = 0.003$), and must travel farther

for treatment (P < .001), with First Nations being more likely than non-First Nations to have to travel greater than 200 km.

4. Wei Chen, et al was conducted a study(2011) on “Prevalence and risk factors of chronic kidney disease: a population study in the Tibetan population”. We conducted a population –based survey in tibet to identify the prevalence and associated risk factors of CKD in subjects living at altitudes of >3500m. One thousand two hundred and eighty-nine Tibetans (≥ 18 years) from four districts of Lhasa city (altitude 3658 m) and eight villages of Dangxiong County (altitude 4200 m) were interviewed and tested for haematuria, albuminuria and estimated glomerular filtration rate (eGFR). The adjusted prevalence of hypertension, albuminuria, haematuria and reduced eGFR were 38.8% (95% CI: 36.2–41.5%), 16.2% (95% CI: 14.1–18.2%), 3.9% (95% CI: 2.8–4.9%) and 2.1% (95% CI: 1.3–2.9%), respectively. Both the presence of hypertension and the presence of albuminuria were strongly and independently associated with hyperuricaemia and elevated haematocrit. We found a higher prevalence of CKD and associated high prevalence of albuminuria, hypertension, hyperuricaemia and high haematocrit in the Tibetan population. The present study indicates the urgent need to develop comprehensive strategies targeted at reducing the CKD burden in this area and may lead to a better understanding of CKD in high-altitude populations.

5. MELANIE K. et al was conducted a study(2003) on “Risk Factors for Chronic Kidney Disease: A Prospective Study of 23,534 Men and Women in Washington County, Maryland”. Prospective data on risk factors for CKD are limited to men, and few studies examine the importance of smoking. A total of 23,534 participants had complete records in 1974 with regard to BP and age and resided in Washington County, MD. During the subsequent 20 yr (425,653 person-years of observation), 143 cases of CKD were identified. Record linkage to HCFA in 1994 for patients with treated ESRD yielded 51 cases (median year, 1989). A detailed medical record review of 168 participants based on kidney disease on death certificates identified another 92 cases of CKD (median year, 1988) and 76 who did not have CKD. Of the 76 subjects who did not have CKD, four were receiving hemodialysis for acute renal failure.

6. Maryam Afrian was conducted a study (1988-2014) on clinical manifestations of kidney disease among US adults with diabetes,

7. Davidson's principles and practice of medicine, 22nd edition, pg.no. 483-54.

8. Nelson's essentials of paediatrics, 7th edition, pg.no. 561-569.

9. Harrison's manual of medicine, 19th edition, pg.no. 752.

10. Alagappan manual of practical medicine, 4th edition, pg.no. 395-426.

III. Aim And Objectives

AIM

To access the clinical profile with reference to the Epidemiology, Etiology of the condition, the management and review of the Drug utilization.

OBJECTIVES

1. To access the clinical profile with reference to the Epidemiology of the chronic kidney disease.
2. To access the clinical profile with reference to the Etiology of the chronic kidney disease.
3. To access the serum creatinine and GFR values of the condition.
4. To Monitor the DUR on drugs used in the treatment of chronic kidney disease.

IV. Methodology

Study design : A Prospective observational study.

Study site : Department of Nephrology,
Government General Hospital, Kurnool.

Study duration : The study will be performed for 3 months.

Sample size : 50 patients.

Inclusion criteria:

- ◆ The Patients with chronic kidney disease of either sex were include in this study
- ◆ The patients under the age group of 20-70 years were include in this study

Exclusion criteria :

- ◆ Paediatric patients with chronic kidney disease were excluded in this study
- ◆ The patients with other than chronic kidney disease were excluded in this study
- ◆ The patients with nephrotic syndrome, glomerulonephritis, polycystic kidney disease and urinary tract infection were excluded in this study

SAMPLING:

- ◆ The clinical profile of 50 patients admitted with chronic kidney disease was selected based on
- ◆ inclusion and exclusion criteria.
- ◆ In the present study, the patients admitted in nephrology with Chronic Kidney Disease

are selected. All the patients with Chronic Kidney Disease were systematically evaluated by nephrologists based on the required investigations.

V. Materials

The data was collected including all baseline parameters of the patients which are as following:

- Demographic details
- Indication for Admission
- Provisional Diagnosis
- General Examination of the patient
- Systemic examination
- Specific treatment and management methods
- Investigations
- Final diagnosis
- Dialysis follow-up

VI. Results

Table1: AGE DISTRIBUTION (n=50)

Total distribution of patients with age group shows that majority of patients were found in between the age groups of <30 years were 6 (12%) patients, 31-40 years were 6 (12%) patients, 41-50years were 13(26%) patients, 51-60 years are 17 (34%) patients and 61-70 years were 8(16%) patients were represented in table:1

Age	No. of Patients	Percentage (%)
< 30	6	12
31-40	6	12
41-50	13	26
51-60	17	34
61-70	8	16

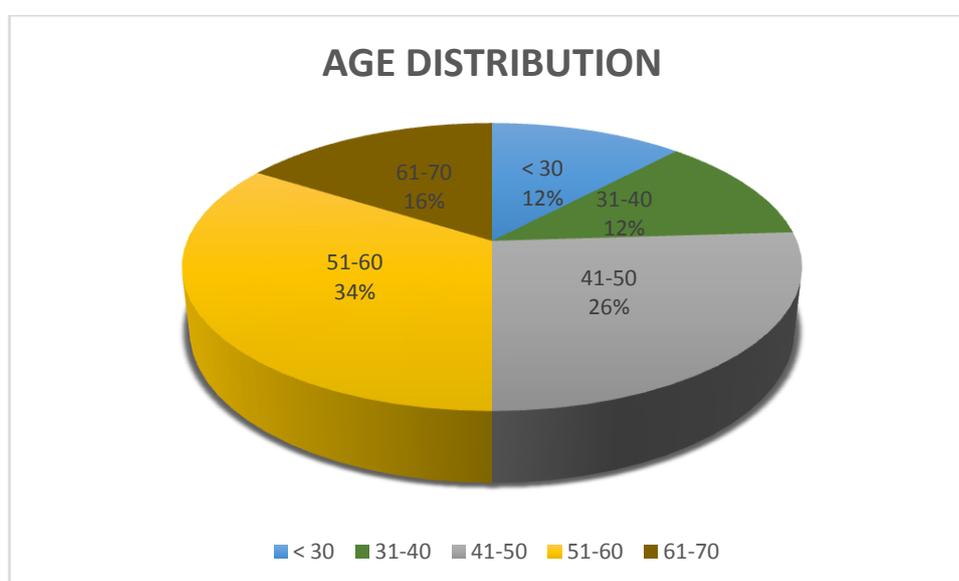


Fig 1: Age Distribution

Table 2: GENDER DISTRIBUTION (n=50)

In our study 50 patients were admitted to the inpatient department of nephrology, the percentage distribution of this study population showed that 41 (82%) patients were males and 9 (18%) patients were females which is represented in the table:2

Gender	No. of Patients	Percentage (%)
Male	41	82
Female	9	18

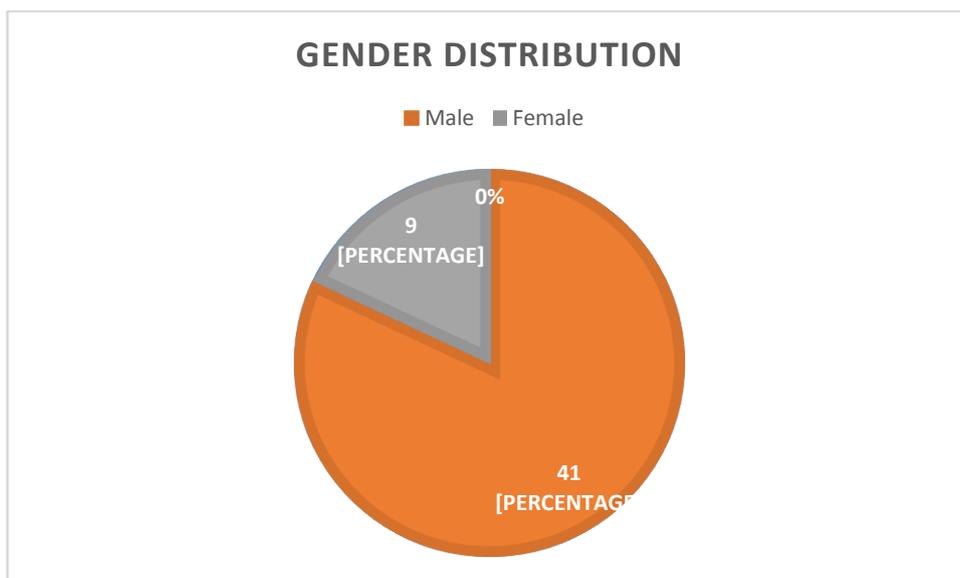


Fig 2: Gender Distribution

Table 3: RESIDENCE STATUS DISTRIBUTION (n=50)

In our study, a total of 50 patients are presented to the inpatient department of Nephrology, majority of the CKD Patients were involved in Urban area 19(62%), followed by Rural area 19(38%).

RESIDENCE STATUS	No. of Patients	Percentage (%)
Rural	19	38
Urban	31	62

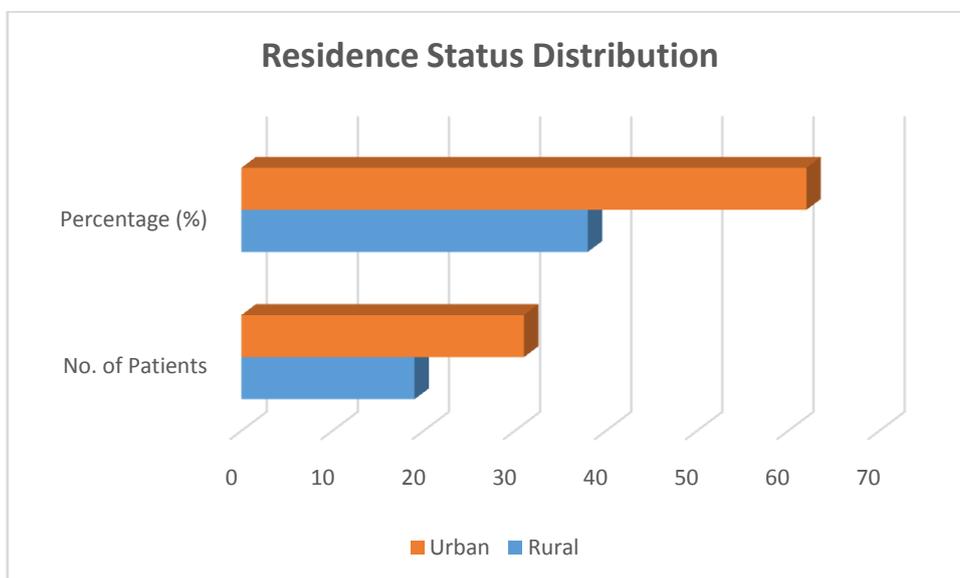


Fig 3: Residence Status Distribution

Table 4: RISK FACTORS DISTRIBUTION (n=50)

In our study among the 50 patients, we observed 26 (52%) patients were with hypertension and 14 (28%) were with hypertension along with diabetes.

RISK FACTOR	No. of Patients	Percentage (%)
Hypertension	26	52
Diabetes	0	0
Hypertension+ Diabetes	14	28

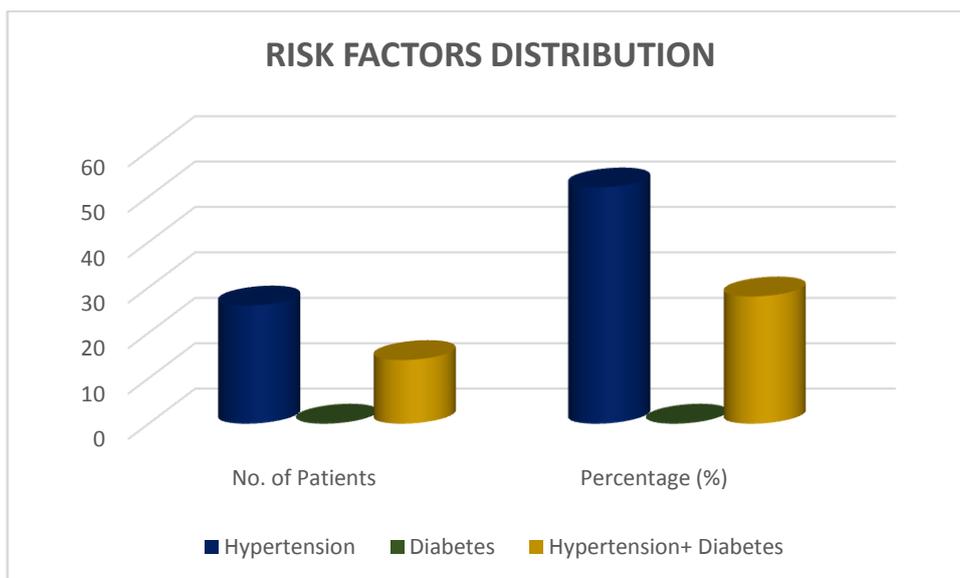


Fig 4: Risk Factors Distribution

Table 5: SERUM CREATININE DISTRIBUTION (n=50)

A total of 50 patients are presented to the inpatient department of Nephrology, we observed that majority of patients were with reported with the range of greater than 10 were 23 (46%) patients, less than 10 were 21 (42%) patients less than 5 were 6 (12%) patients, the percentage distribution of the serum creatinine levels were represented in the table:5

SERUM CREATININE RANGE	No. of Patients	Percentage (%)
< 5	6	12
< 10	21	42
>10	23	46

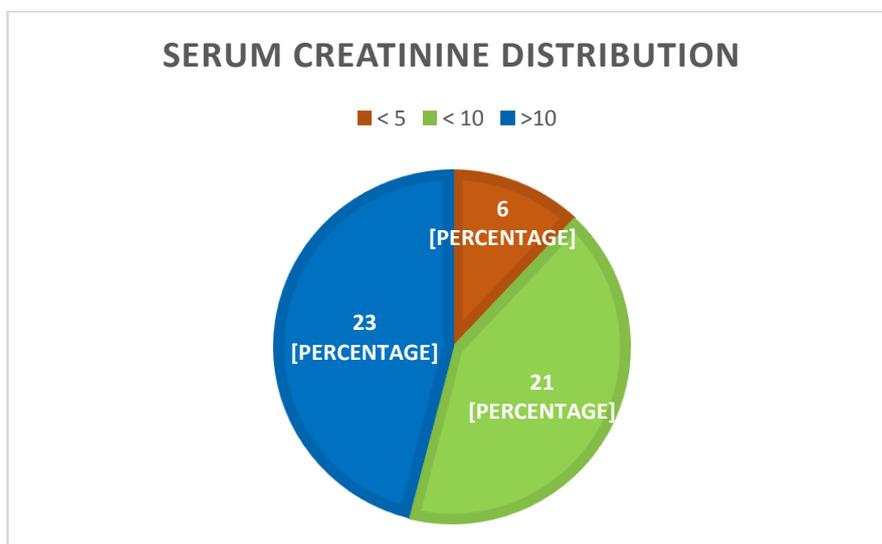


Fig 5: Serum Creatinine Distribution

Table 6: GFR DISTRIBUTION (n=50)

In our study the patients diagnosed with CKD based on GFR range shows that majority of patients were found in between GFR Range less than 5 were 20 (40%) followed by less than 10 were 7 (14%) and greater than 10 were 23 (46%) which are represented in the table:6

GFR RANGE	No. of Patients	Percentage (%)
< 5	20	40
< 10	7	14
>10	23	46

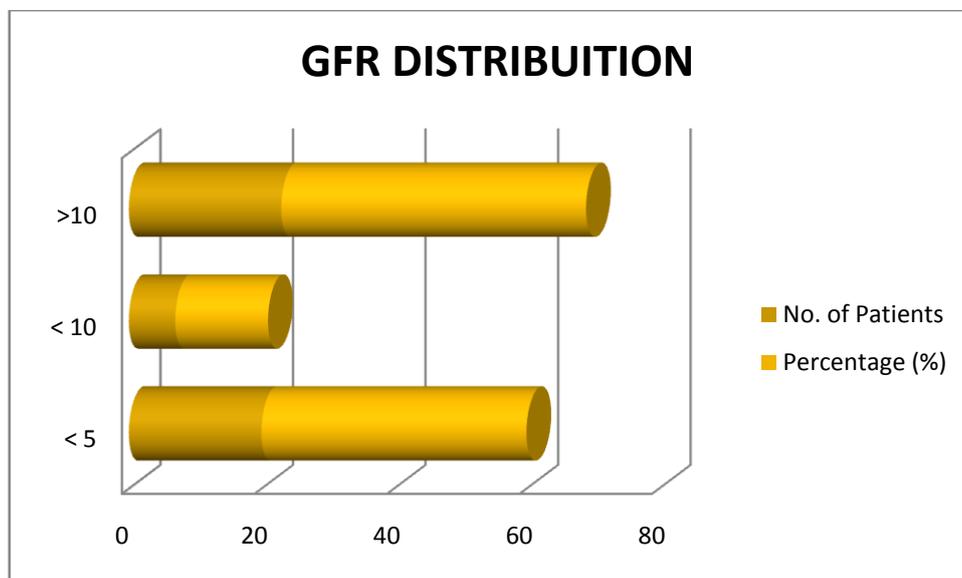


Fig 6: GFR Distribution

Table 7: TREATMENT OF HYPERTENSION (n=50)

In our study the hypertensive patients were mostly prescribed class of drugs were calcium channel blockers 39(78%), followed by Beta blockers 13(26%), Diuretics 24(48%), and others 13(26%) which are presented in table :7

CLASS OF DRUGS	No. of Patients Prescribed	Percentage (%)
Calcium channel blockers	39	78
β Blockers	13	26
Diuretics	24	48
Others	13	26

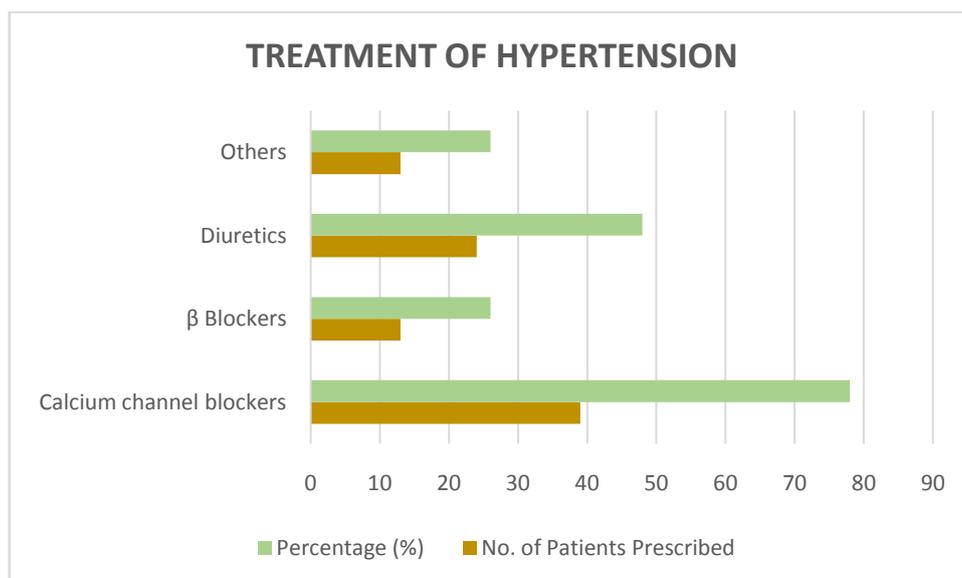


Fig 7: Treatment of Hypertension

VII. Discussion

In our prospective observational study of fifty cases of Chronic Kidney Disease which were carried out for two months duration in GGH, KURNOOL, it was found that males were prone to CKD.

Total distribution of patients with age group shows that majority of patients were found in between the age groups of <30 years were 6 (12%) patients, 31-40 years were 6 (12%) patients, 41-50 years were 13(26%) patients, 51-60 years are 17 (34%) patients and 61-70 years were 8(16%) patients.

In our study 50 patients were admitted to the inpatient department of nephrology, the percentage distribution of this study population showed that 41 (82%) patients were males and 9 (18%) patients were females.

In our study, a total of 50 patients are presented to the inpatient department of Nephrology, majority of the CKD Patients were involved in Urban area 19(62%), followed by Rural area 19(38%).

In our study among the 50 patients, we observed 26 (52%) patients were with hypertension and 14 (28%) were with hypertension along with diabetes.

A total of 50 patients are presented to the inpatient department of Nephrology, we observed that majority of patients were with reported with the range of greater than 10 were 23 (46%) patients, less than 10 were 21 (42%) patients less than 5 were 6 (12%) patients, the percentage distribution of the serum creatinine levels were presented.

In our study the patients diagnosed with CKD based on GFR range shows that majority of patients were found in between GFR Range less than 5 were 20 (40%) followed by less than 10 were 7(14%) and greater than 10 were 23(46%).

In our study the hypertensive patients were mostly prescribed class of drugs were calcium channel blockers 39(78%), followed by Beta blockers 13(26%), Diuretics 24(48%), and others 13(26%).

VIII. Conclusion

The study was carried out in an attempt to find out the major risk factors of the chronic Kidney Disease and to evaluate the majorly prescribing class of antihypertensive at GGH, KURNOOL.

In most of the cases drug utilization Review was done effectively with various classes of drugs used in Chronic Kidney Disease.

Most of the patients admitted in the department of nephrology with Chronic Kidney Disease at GGH KURNOOL were age group of 50-60 years. It shows that elderly patients were more prone to kidney failure compared to age group less than 50 years.

In our study, we observed that majority of patients admitted in the department of nephrology with Chronic Kidney Disease at GGH KURNOOL belongs to Urban area (82%), which shows that Un-awareness of the condition of the disease.

In our study the majorly observed risk factors were Hypertension and Diabetes, so the health care professionals should have to conduct the Awareness programme as much as possible which helps in enhancement of the patient's quality of life.

Early identification of the risk factors plays a crucial role in qualitative and quantitative patient care.

Finally we conclude that proper risk factors management (HTN, DM) and following the guidelines in the treatment reduces the severity of the Disease and their prognostic factor shows the good result.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

ABBREVIATIONS

CKD	: Chronic Kidney Disease
RRT	: Renal Replacement Therapy
ESRD or ESRF	: End-Stage Renal Disease Or Failure
GFR	: Glomerular Filtration Rate
HTN	: Hypertension
DM	: Diabetes Mellitus

SUMMARY

- Among the CKD patients, elderly patients were more prone to kidney failure compared to younger patients.
- The most common risk factors were Hypertension and Diabetes, so the health care professionals should have to conduct the Awareness programme as much as possible which helps in enhancement of the patient's quality of life.
- Proper risk factors management (HTN, DM) and following the guidelines in the treatment reduces the severity of the Disease.

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