Prospective Study on Prevalence of Symptoms and Complications in Chronic Kidney Disease Patients in Tertiary Care Hospitals of Khammam Region

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Abstract- Chronic Kidney Disease (CKD) is a global public health problem affecting the adult population and is associated with increased morbidity and mortality. The aim of our work was to study the prevalence of symptoms and complications in chronic kidney disease patients in tertiary care hospitals with sample size of 301 patients. Males were more prone to chronic kidney disease. Most cases were indentified in stage 4 and 5 which is increasing the chances of incidence of complication and mortality. Highest reported symptoms were edema in 172 patients, 125 patients had decreased urine output, 83 patients had breathlessness. The major complications reported in our study were heart diseases, diabetes mellitus, septic shock, urosepsis, fluid overload. From our study it was concluded that there is a rising prevalence of complications in the patients suffering with Chronic Kidney Disease. Early intervention may retard the progression of kidney disease and the associated complications.

Keywords: Co morbidities, chronic kidney disease, Drug utilization, risk factors, Prevalence.

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I. INTRODUCTION

Chronic kidney disease (CKD) is a heterogeneous disease that affects the structure of the kidney and its function. It is defined as kidney damage or decreased glomerular filtration rate of less than 60 mL / min / 1.73 m2 for 3 months or more [1-3]. It is characterized by a reduced ability of the kidneys to maintain low and normal levels of protein metabolism products (such as urea), normal blood pressure, hematocrit, sodium, water, potassium and acid-base balance [4]. Chronic kidney disease is an emerging global public health problem. CKD is increasingly common in developed and developing countries [5].

Chronic kidney disease (CKD) is associated with various comorbidities and adverse clinical outcomes, such as cardiovascular events, renal failure requiring renal replacement therapy, mortality and poor quality of life for survivors in general [6-9].

In India, the prevalence of CKD was observed to be 17.2% and 6% have CKD at stage 3 or worse and is seen more among men than women due to stress, alcoholism, hypertension, diabetes mellitus, smoking and cumulative risk. chronic vascular disease (CVD) factors [10-11]. Diabetes mellitus, hypertension, smoking, cardiovascular disease (CVD), age, chronic use of non-steroidal anti-inflammatory drugs (NSAIDs) and obesity are the main causes of CKD [12].

The lack of community screening programs has led to detecting CKD patients at an advanced stage. It is possible that early diagnosis of kidney disease through community-based screening programs could impact this problem through early intervention. The Kidney Disease Early Detection and Assessment (SEEK) project was designed and conducted to generate data to determine the prevalence and risk factors of CKD in India. To study the prevalence of risk factors, symptoms, comorbidities and complications and in chronic kidney disease in tertiary hospitals.

B. METHODOLOGY

This study was a prospective observational study conducted over a 1-year period from January 2020 to December 2020 in tertiary care hospitals of Khammam region with a sample of 301 cases. Inclusion criteria include patients over 20 years of age, patients with elevated serum creatinine levels, GFR levels, ESR levels, and patients with acute renal failure. The exclusion criteria include patients who are kidney transplant patients, patients whose data are not relevant to the study, and patients who are unwilling to participate in the study.

Patients were prospectively selected for study by simple random sampling. Patients were classified into men and women. In addition, patients are classified according to their age group, social status. The patients were then classified according to their disease status. The risk factor and complications of CKD have been identified. Statistical analysis will be carried out by Microsoft Office (MS-Word, MS-Excel).

III. RESULTS

Among them 301 cases who met out inclusion criteria were included in our study. All the cases were categorized as age, gender, family history, residence, social habits and nephrotoxic drugs and CKD stages and symptoms and complication were reported.

A. Age

We have studied the cases of age from 20 years to 90 years in both males and females visiting to the nephrology department in tertiary care hospitals. There were 12(5.88%) cases in males and 11(11.34%) cases in females in age group of 20 to30 years, whereas33(16.17%) cases in males and 26 (26.80%)cases in females in age group of 31 to40 years, and 52(25.49%) cases in males and 20 (20.61%)cases in females in age group of 41 to 50years, often 48 (23.52%) cases in males and 13 (13.40%) cases in females in age group of 51 to 60 years, and by the age of 61 to 70 years 37 (18.13%) cases in males and 17(17.52%) cases in females, and by the age of 71 to 90 years 22 (10.7%) cases in males and 10 (10.30%) case in females. The results were given in figure 1.
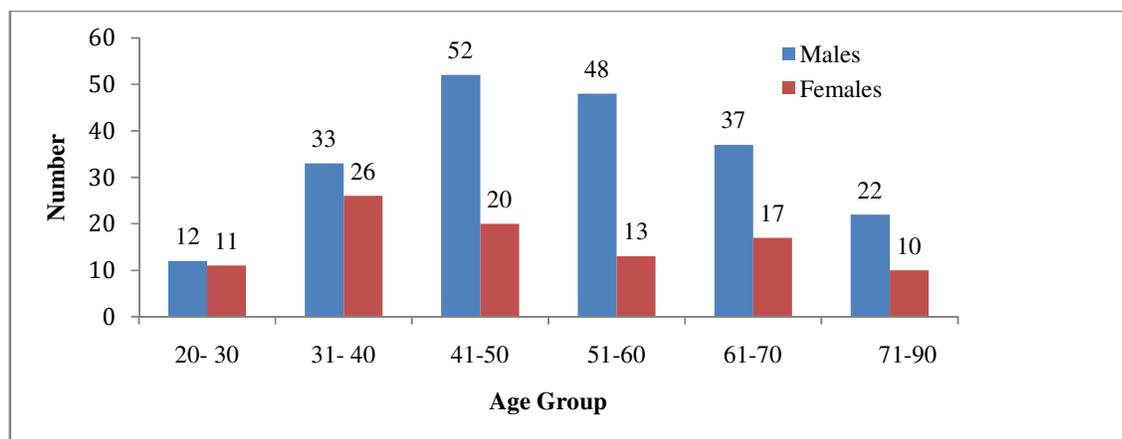

Fig.1. Categorization of age in CKD patients.

B. Gender

Among 301 cases, 204 cases were males (67.77%) and 97 cases were females (32.22%).
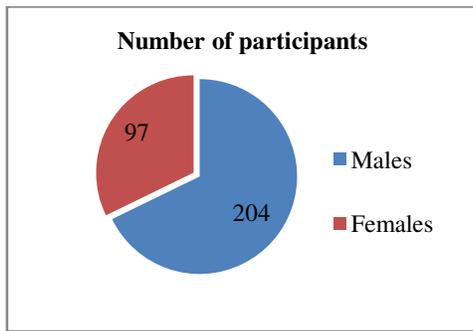
The results were given figure 2.

Fig.2. Categorization of gender

C. Residence

Among 301 cases, 168 patients were in rural patients and urban patients were 133. The results were given in figure 3
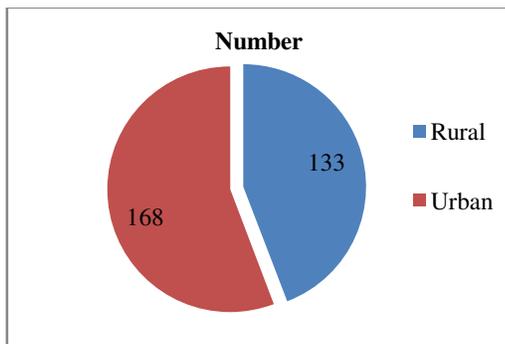

Fig. 3. Participants according to their residence from where they belong (Urban or Rural)

D. Family history

Among 301 participants 34 participants were having family history and 267 participants were not having family history. There were 15 (37.5%) cases in diabetes mellitus, 7(17.5%) cases in hypertension, 8(20%) cases in hypothyroidism respectively. The results were given in figure 4.
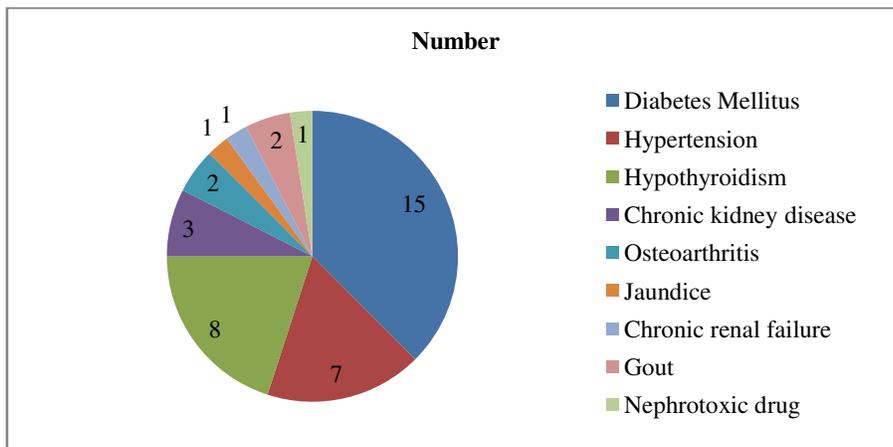

Fig. 4. Family history of CKD patients

E. Social Habits

Among 301cases 73 cases are observed with social habits. In 73 cases alcohol participants were 24 (7.97%), smoking participants were 18(5.98%)and drug abuse participants are 31(10.3%). The results were given in & figure5 .
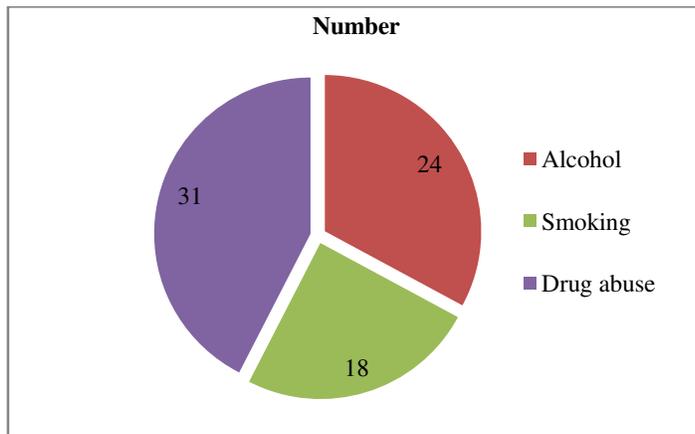
Fig. 5. According to their social habits, participants were divided in 3 sub-categories.

F. Stages

All the cases were categorized in to 5 stages based on GFR rate. There are 12 cases in G2, 42 cases in G3a, 58 cases in G3b, 93 cases in G4, 96 cases in G5 stage. The results were given in figure 6.
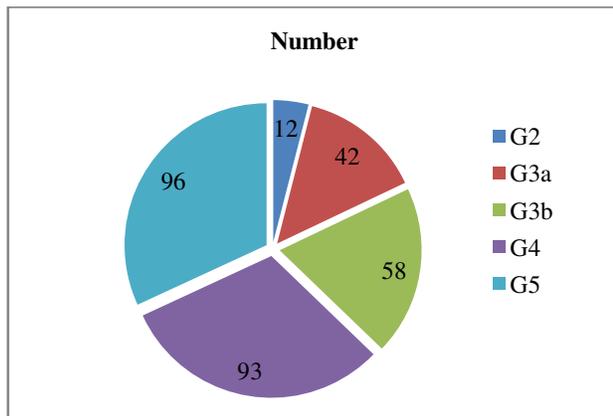
Fig. 6. Categorization of patients according to their CKD stage

G. CKD symptoms

 Total 60 symptoms were observed out of which 172(57.14%) patients had edema, 125(41.5%) patients had decreased urine output, 83 (27.5%) patients had breathlessness, 79(26.2%) patients had generalized weakness, 77 (25.5%) patients had loss of appetite, 55 (18.2%) patients had nausea & vomiting respectively. The results were given in table 1.

Table 1: Based on the Participants condition CKD symptoms were listed below

CKD Symptoms	Number of Participants	Percentage
Edema	172	57.14
Decreased urine output	125	41.52
Breathlessness	83	27.57
Generalized weakness	79	26.24
Loss of appetite	77	25.58

Nausea &vomiting	55	18.27
Muscle cramps and backaches	52	17.27
Fever	49	16.27
Itching &skin rashes	45	14.95
Fatigue	42	13.95
Pallor	37	12.29
Abdominal pain	28	9.30
Chest pain	22	7.30
Headache	11	3.65
Urinary tract infection	10	3.32
Weight loss	10	3.32
Constipation	8	2.65
Insomnia	7	2.32
Fluid retention	6	1.99

H. CKD-Related complications

There were so numerous diverse sorts of complications were enrolled agreeing to system, where they appeared their action related to the framework. The complications due to chronic kidney disease was categorized in according to the system type that is getting affected. In Hormonal system, 5 (1.66%) number of cases were having Diabetes mellitus, in Cardiovascular system, Heart diseases had the more prevalence of cases that was 37(12.29%), in Blood, Septic 17(5.64%) number of cases had shock, 22(7.30%) cases of Fluid overload and Urosepsis in 10 (3.32%) cases was reported in Renal system, remaining systems were having less number of cases. The results were given in table 2 to 7.

Table 2: CKD related complications in Renal system

System	Complications	Number	Percentage
	Fluid overload	22	7.30
	Urosepsis	10	3.32
	Acute kidney injury	6	1.99
	Acute Pyelonephritis	5	1.66
	Obstructive nephropathy	5	1.66
	Acute tubular necrosis	5	1.66
	Proteinuria	3	0.99
Renal system	Nephrotic syndrome	3	0.99
	Renal calculi	2	0.66
	Anuria	2	0.66
	Left pyelonephritis	1	0.33
	Oliguria	1	0.33
	Uremic pruritis	1	0.33
	Anti-Glomerular basement membrane disease	1	0.33
	Diabetic kidney disease	1	0.33

Table 3: CKD related complications in Blood system

System	Complications	Number	Percentage
Blood	Septic shock	17	5.64
	Uraemia	10	3.32
	Anemia	8	2.65
	Metabolic acidosis	7	2.32
	Thrombocytopenia	5	1.66
	Hyperuricemia	1	0.33
	Hyperphosphatemia	1	0.33
	Hyperlipidemia	1	0.33

Table 4: CKD related complications in Harmonal system

System	Complications	Number	Percentage
Hormones	Diabetes Mellitus	5	1.66
	Diabetic cystopathy	1	0.33
	Recurrent hypoglycaemia	1	0.33
	Hypothyroidism	1	0.33

Table 5: CKD related complications in cardiovascular system

System	Complications	Number	Percentage
Cardiovascular system	Heart diseases	37	12.29
	Hypertension	21	6.97
	Coronary artery disease	2	0.66

Table 6: CKD related complications in Central nervous system

System	Complications	Number	Percentage
Central nervous system	Seizure	2	0.66
	Insomnia	1	0.33
	Cervical disorders	1	0.33
	Spondylitis	1	0.33
	Uremic encephalopathy	1	0.33
	Parkinsonism	1	0.33
	Septic encephalopathy	1	0.33

Table 7: CKD related complications in various systems

System	Complications	Number	Percentage
Articulatory System	Gout	2	0.66
	Osteoarthritis	2	0.66
Ophthalmic system	Diabetic retinopathy	1	0.33
Integumentary system	Left lower limb cellulitis	1	0.33
Immune system	Retroviral disease on art	1	0.33
Hepatic system	Cirrhosis of liver	2	0.66
Gastro-intestinal system	Acute Gastroenteritis	1	0.33
Digestive system and endocrine system	Gross ascites	1	0.33
	Acute pancreatitis	1	0.33
Miscellaneous	Dyselectrolytemia	4	1.32
	Hyperkalaemia	1	0.33
	Hypokalaemia	1	0.33
	Periodic paralysis	1	0.33
	Severe hypoalbuminemia	1	0.33
	Left leg filariasis	1	0.33

IV. DISCUSSION

Chronic kidney disease is the presence of kidney damage, manifested by abnormal albumin excretion or reduced kidney function, quantified by measurement or estimated by GFR.

Patients enrolled in the study were classified according to their age and gender. The highest incidence of cases was in the 41 to 60 year age group. The mean age for the incidence of chronic kidney disease was 51.48 years.

In our study it was reported that men were more prone to kidney disease than women. This could be because higher testosterone levels in men cause loss of kidney function. Men's kidneys may not be protected from estrogen, which is higher in women until they attain menopause.

Patients in rural areas were more than patients in urban areas. This was due to a lack of awareness of the disease and its management.

Family history is common among patients with incident kidney disease. Hypertension and diabetes in family history are a strong predictor of kidney disease in incident patients [13].

Social habits such as smoking, alcoholism and drug abuse are the main risk factor for acute kidney disease.

Most cases have been observed in stage 4 and stage 5. Treatment of the disease in the advanced stages leads to poor results and there is also the possibility of an incidence of more complications that could affect therapy.

The most commonly reported symptoms in patients were edema, decreased urine output, shortness of breath, generalized weakness, loss of appetite, and nausea and vomiting. The other less reported symptoms were muscle cramps and back pain, fever, itching and rash, fatigue, paleness, abdominal pain, chest pain, headache, urinary tract infection, weight loss, constipation, insomnia, fluid retention . The incidence of symptoms was similar to the previously reported results [14].

The main complication of kidney disease was diabetes mellitus, heart disease, septic shock, fluid overload, and urosepsis.

Damaged kidneys can release too much renin, which can lead to high blood pressure and thus increases the risk of heart attack, congestive heart failure and stroke.

In chronic kidney failure patients, the kidneys can no longer remove toxins such as urea. Urea is directly responsible for the poor insulin secretion that causes diabetes in patients with kidney disease.

Complications in the blood system include septic shock, uremia, anemia, metabolic acidosis. Central nervous system complications include seizures, insomnia, cervical disorders, spondylitis, uremic encephalopathy, parkinsonism, septic encephalopathy. Cognitive decline is recognized as a common complication of CKD and remains poorly identified. Guanidine compounds that have been retained in the body due to kidney damage have long been linked to the cause of uremic encephalopathy. These compounds are known to induce seizures in CKD patients.

V. CONCLUSION

The present study aims to observe the increasing incidence of CKD in the population. Since many cases were observed in the later stages G4 and G5, an early diagnosis of the disease is required which will improve the health status of the patients. Symptoms that would be the cause of kidney disease have been reported. This would help doctors to assess the patient's condition for kidney disease as soon as possible. The complication of chronic kidney disease has been reported in several systems of our body. Understanding the pathophysiological mechanisms of these conditions can provide insight into effective management strategies in patients with chronic kidney disease.

REFERENCES

[1] A.S. Levey, J. Coresh, Chronic kidney disease, *Lancet,* 379, 165-80, 2012.

[2] National Kidney Foundation. KDOQI clinical practice guidelines for chronic kidney disease: Evaluation, classification, and stratification. *Am J Kidney Dis*, 39, S1-266, 2012.

[3] W.G. Couser, G. Remuzzi, S. Mendis S, The contribution of chronic kidney disease to the global burden of major noncommunicable diseases, *Kidney Int*, 80(12), 1258−1270, 2011.

[4] R.G. Like, Chronic renal failure. Goldman: Cecil Textbook of Medicine, 21st ed. Philadelphia: W.B. Saunders Company, 571-578, 1998.

[5] R.C. Atkins, The epidemiology of chronic kidney disease, *Kidney Int Suppl,* 67, S14−S18, 2005.

[6] M.T. James, B.R. Hemmelgarn, M. Tonelli, Early recognition and prevention of chronic kidney disease, *Lancet,* 375, 1296–1309, 2010.

[7] E.L. Meguid, A. Nahas, A.K. Bello, Chronic kidney disease: the global challenge, *Lancet*, 365:331–340, 2005.

[8] A.S. Levey, P.E. de Jong, J. Coresh, The definition, classification, and prognosis of chronic kidney disease: a KDIGO controversies conference report, *Kidney Int,* 80, 17–28, 2011.

[9] J. Yuan, X.R. Zou, S.P. Han, Prevalence and risk factors for cardiovascular disease among chronic kidney disease patients: results from the Chinese cohort study of chronic kidney disease (C-STRIDE), BMC Nephrol, 18, 23, 2017.

[10] Jafar TH, Stark PC, Schmid CH. Progression of chronic kidney disease: the role of blood pressure control, proteinuria, and angiotensin-converting enzyme inhibition: a patient-level meta-analysis. Ann Intern Med. 2003;139:244.

[11] N.V. Rani, R. Thomas, E. Rohini, P. Soundararajan, G. Kannan, P. Thennarasu, A study on drug related problems in chronic kidney disease patients of a tertiary care teaching hospital in South India, *World J Pharmaceu Res*, 3, 1403-17, 2014.

[12] C.O. Alebiosu, O.O. Ayodele, A. Abbas, Chronic Renal Failure at the Olabisi Onabanjo University Teaching Hospital, Sagamu, Nigeria. *Afr Health Sci*, 6(3), 132-8, 2006.

[13] R. Ferguson, C.E. Grim, T.J. Opgenorth, A familial risk of chronic renal failure among blacks on dialysis, *J Clin Epidemiol* , 4,1189 –1196, 1988.

[14] Y. S. Renuka Prasad, H. A. Krishna Murthy, Clinical and biochemical spectrum of chronic kidney disease in tertiary care centre, *J Evol Med and Den Sci*, 1, 1214-1222, 2012.