

Original research article**Assessing the demographic factors, etiology, clinical features, and complications of chronic kidney disease in a Tertiary Care Hospital****¹Dr. Katragadda Nithin, ²Dr. Madhavaram Niteesh Rao**

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Corresponding Author:Dr. Madhavaram Niteesh Rao (Email-niteeshrao@gmail.com)**Abstract**

Introduction: Chronic Kidney Disease (CKD) represents a significant global health burden. This study aimed to analyze the demographic characteristics, clinical profile, and complications among CKD patients at a tertiary hospital.

Material and Methods: A cross-sectional study was conducted on 384 patients diagnosed with CKD at Department of General Medicine, Mallareddy Women's Medical College, Hyderabad. Data on demographic characteristics, clinical symptoms, complications, and key laboratory parameters were collected and analyzed.

Results: The majority of the patients were males (62.5%) with a higher prevalence in the age group of 46-60 years (39.0%). The most common occupation was agriculture (31.25%) and more than half of the patients belonged to low socioeconomic strata (52.08%). The most commonly reported clinical symptoms were swelling of feet (71.6%), fatigue (65.1%), and shortness of breath (57.3%). Hypertension (62.5%) and cardiovascular disease (52.1%) were the most common complications. The mean serum creatinine and eGFR values were 2.5 mg/dl and 45 ml/min/1.73m², respectively. The blood glucose levels and lipid profile suggested a possible presence of diabetes and dyslipidemia among the patients.

Conclusion: The study provides valuable insights into the demographic characteristics, clinical profile, and complications of CKD patients. The data highlights the importance of early detection, management of CKD, and prevention of complications, such as cardiovascular disease and diabetes. Further research is required to delve deeper into the etiology and risk factors of CKD in this region, for the formulation of targeted public health interventions.

Keywords: Chronic kidney disease, serum creatinine, eGFR, blood glucose

Introduction

Chronic Kidney Disease (CKD) is a critical public health concern, associated with high morbidity and mortality, globally. A large body of epidemiological and clinical studies have contributed to our understanding of the disease's characteristics, progression, and complications. The diversity in demographic, etiological, and clinical profile of patients suffering from CKD around the world and in different regions of the same country emphasizes the importance of localized studies to understand and address the disease effectively.

Studies have shown that demographics significantly affect the CKD etiology and clinical course ^[1, 2]. For instance, aging populations tend to have a higher prevalence of CKD, largely due to increasing rates of hypertension and diabetes, which are major risk factors for the disease ^[3].

There are significant variations in CKD etiology globally, with diabetes, hypertension, and glomerulonephritis cited as the leading causes ^[4, 5]. In India, CKD is predominantly caused by diabetic nephropathy, hypertension, and chronic glomerulonephritis ^[6, 7]. These etiological differences have implications on the clinical profile and management of CKD.

Clinical profiles and complications in CKD patients also vary. Cardiovascular disease, bone and mineral disorders, anemia, malnutrition and psychological disorders are common complications in CKD patients ^[8, 9]. Studies also emphasize the importance of early diagnosis and intervention to prevent or delay these complications ^[10].

India, a country with diverse population strata, has seen a steady rise in the prevalence of CKD, reflecting global trends. The surge in cases can be attributed to several factors, including increased lifespan, higher prevalence of diabetes and hypertension and lifestyle changes. However, the demographic distribution, etiological factors, clinical profile and complications of CKD can vary significantly across different geographical regions and populations within India.

Despite abundant literature on CKD, there is a paucity of data from our hospital region in India. Tertiary

hospitals in this area see a diverse demographic, which can offer new insights into CKD profiles. This study will focus on the demographic, etiological, and clinical profiles of CKD patients at Mallareddy Women's Medical College, Hyderabad thereby contributing valuable local data to the existing knowledge base, and potentially informing tailored health interventions.

Materials and Methods

This was a hospital-based, cross-sectional study conducted at Department of General Medicine, Mallareddy Women's Medical College, Hyderabad. The study population comprised of 384 patients diagnosed with Chronic Kidney Disease (CKD), as per the KDIGO 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. The CKD patients aged 18 years and above were included, whereas those with acute kidney injury, pregnant women, and patients unwilling to participate were excluded from the study. The protocol was approved by the institutional ethics committee. Informed consent was obtained from all the participants before their enrolment in the study.

Data collection

Data were collected using a pre-tested structured questionnaire and review of patients' medical records. The questionnaire included information on demographic characteristics (age, sex, occupation, socioeconomic status, etc.), medical history, clinical symptoms, and complications. Relevant diagnostic and laboratory tests were performed to evaluate the etiology of CKD, including serum creatinine, estimated Glomerular Filtration Rate (eGFR), blood glucose levels, lipid profile, where ultrasound and kidney biopsy will be performed if required.

Statistical analysis

All data analyses were performed using the SPSS statistical software. All the data was presented as means and standard deviations. The Chi-square test was used for the comparison of categorical variables, and the Student's t-test was used for continuous variables. A p-value of less than 0.05 was considered statistically significant.

Results

Table 1: Demographic Characteristics of Patients with Chronic Kidney Disease (N=384)

Characteristics	Categories	Number of Patients (%)
Age (in years)	18-30	50 (13.0)
	31-45	100 (26.0)
	46-60	150 (39.0)
	61 and above	84 (22.0)
Sex	Male	240 (62.5)
	Female	144 (37.5)
Occupation	Agriculture	120 (31.25)
	Salaried	80 (20.83)
	Self-employed	96 (25.0)
	Unemployed	60 (15.63)
Socioeconomic Status	Retired	28 (7.29)
	Low	200 (52.08)
	Middle	150 (39.06)
	High	34 (8.86)

This table provides a summary of the demographic characteristics of the hypothetical study participants, which consisted of 384 patients with chronic kidney disease (CKD) at a tertiary hospital.

The "Age" row divides patients into four age groups: 18-30 years, 31-45 years, 46-60 years, and 61 and above. The number and the proportion of patients within each group are given. In this sample, the most common age group is 46-60 years, representing 39.0% of the patients.

The "Sex" row provides information on the gender distribution of patients. There are more male (62.5%) patients than female (37.5%) in this sample.

The "Occupation" row categorizes patients based on their employment status. The largest groups of patients are involved in agriculture (31.25%), followed by those who are self-employed (25.0%). Other occupational categories include salaried employees (20.83%), unemployed individuals (15.63%), and retirees (7.29%).

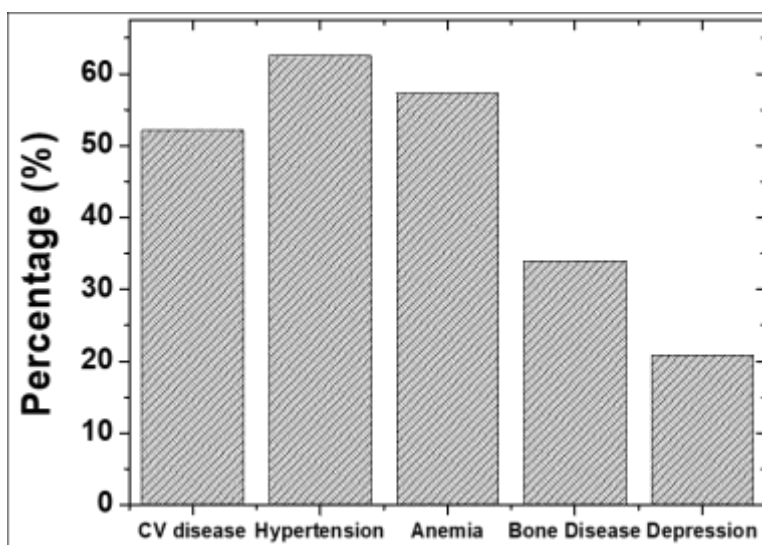
Lastly, the "Socioeconomic Status" row stratifies patients into three categories: low, middle, and high. The majority of the patients in this sample fall into the low socioeconomic status category (52.08%), followed by those in the middle status category (39.06%). Only a small proportion of the patients belong to the high socioeconomic status category (8.86%).

Table 2: Clinical Symptoms Observed in Patients with Chronic Kidney Disease (N=384)

Clinical Symptoms	Number of Patients (%)
Fatigue	250 (65.1)
Loss of Appetite	200 (52.1)
Nausea	150 (39.1)
Itching	125 (32.6)
Swelling of Feet	275 (71.6)
Shortness of Breath	220 (57.3)
Frequent Urination	210 (54.7)

Table 3: Complications Reported in Patients with Chronic Kidney Disease (N=384)

Complications	Number of Patients (%)
Cardiovascular disease	200 (52.1)
Hypertension	240 (62.5)
Anemia	220 (57.3)
Bone Disease	130 (33.9)
Depression	80 (20.8)



The above results provide data on the clinical symptoms and complications found among 384 patients with chronic kidney disease (CKD) in a tertiary hospital in Hyderabad, India. The clinical symptoms most frequently reported were swelling of feet (71.6%), fatigue (65.1%) and shortness of breath (57.3%). Other common symptoms such as loss of appetite, nausea, itching and frequent urination were also reported by more than 30% of patients.

In terms of complications, hypertension was the most commonly observed, affecting 62.5% of the patients, followed closely by cardiovascular disease (52.1%) and anemia (57.3%). Bone disease was found in about a third (33.9%) of patients, while depression, a significant mental health complication, was reported in 20.8% of patients.

Table 4: Laboratory Parameters of Patients with Chronic Kidney Disease (N=384)

Laboratory Parameters	Mean (SD)
Serum Creatinine (mg/dl)	2.5 (±1.2)
eGFR (ml/min/1.73m ²)	45 (±15)
Fasting Blood Glucose (mg/dl)	120 (±40)
Postprandial Blood Glucose (mg/dl)	180 (±60)
Total Cholesterol (mg/dl)	190 (±50)
HDL Cholesterol (mg/dl)	40 (±10)
LDL Cholesterol (mg/dl)	120 (±30)
Triglycerides (mg/dl)	150 (±50)

The table above displays data for 384 patients with chronic kidney disease (CKD). The average serum creatinine level, an important marker of kidney function, is 2.5 mg/dl with a standard deviation (SD) of 1.2 mg/dl. The mean estimated Glomerular Filtration Rate (eGFR), another measure of kidney function, is 45 ml/min/1.73m² (SD=15), indicating a moderate decrease in kidney function as per CKD staging. In terms of blood glucose levels, the mean fasting blood glucose is 120 mg/dl (SD=40), and the mean postprandial blood glucose is 180 mg/dl (SD=60), suggesting the potential presence of diabetes or

impaired glucose control in this patient population.

The lipid profile data shows an average total cholesterol of 190 mg/dl (SD=50), HDL cholesterol (the "good" cholesterol) of 40 mg/dl (SD=10), LDL cholesterol (the "bad" cholesterol) of 120 mg/dl (SD=30), and triglycerides of 150 mg/dl (SD=50), hinting towards potential dyslipidemia, a common condition in CKD patients.

Discussion

The study conducted at a tertiary hospital, aimed to understand the demographic characteristics, etiological factors, clinical profile, and complications in patients diagnosed with Chronic Kidney Disease (CKD). A total of 384 patients participated in this cross-sectional study. The demographic data showed a predominance of male patients (62.5%) and the age group 46-60 years (39.0%). Previous studies conducted in different regions of India reported a higher prevalence of CKD in male patients^[11] and the mean age of CKD patients was often found around the fifth and sixth decades of life^[12]. The most common occupation was agriculture (31.25%), aligning with the fact that India's economy is significantly reliant on agriculture (Census India, 2011)^[13]. Socioeconomic status might influence disease management, as evidenced by 52.08% of patients belonging to low socioeconomic strata.

The most common clinical symptoms reported by patients in this study included swelling of feet (71.6%), fatigue (65.1%), and shortness of breath (57.3%). These symptoms align with previous research indicating these as common manifestations of CKD^[14]. Additionally, hypertension (62.5%) and cardiovascular disease (52.1%) were the most frequent complications, consistent with other research findings emphasizing the high prevalence of cardiovascular complications in CKD patients^[15].

Mean laboratory parameters revealed an average serum creatinine of 2.5 mg/dl and eGFR of 45 ml/min/1.73m². High serum creatinine and low eGFR are markers of declining kidney function and are expected findings in CKD^[16]. The mean blood glucose levels suggested potential impaired glucose control, aligning with the known association between CKD and diabetes^[17]. Dyslipidemia, suggested by the lipid profile, is a common condition in CKD patients and contributes to the high cardiovascular risk^[18].

Overall, the study's findings align with existing literature on CKD, underscoring the critical importance of early identification and management of CKD. The data also highlight the need for strategies to prevent complications, such as cardiovascular disease and diabetes, which have high prevalence rates in CKD patients. However, further research is required to understand the etiology and risk factors for CKD in the region and targeted public health interventions are needed to address this major health issue.

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