



CONNECTING DOTS: AN OBSERVATIONAL INVESTIGATION INTO COMMON ETIOLOGICAL FACTORS OF CHRONIC KIDNEY DISEASE

General Medicine

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ABSTRACT

Introduction: Chronic Kidney Disease (CKD) has emerged as a pervasive and formidable public health dilemma on a global scale. In western countries, diabetes and hypertension account for over 2/3rd of the cases of CKD. According to the previous study, in India too, diabetic mellitus (DM) and hypertension today account for 40-60% cases of CKD. The burden of CKD extends beyond its direct impact on renal function. Its association with cardiovascular morbidity, metabolic disorders, and diminished quality of life underscores the intricate connections between renal health and overall well-being. **Materials and methods:** It was tertiary hospital based observational study conducted on patients of chronic kidney disease in Department of Medicine and Department of Nephrology IGMC Shimla, Himachal Pradesh Study was conducted in 60 patients with age 18 years or more with chronic kidney disease and those who gave consent to participate in the study. **Results:** In this study mean age of patients was 55.18±14.63 years. There was female predominance with 34(57%) female and 26(43%) males. Most of patients 40 (67%) were from rural area and 20 (33%) were from urban area. Most common etiology for CKD among patients enrolled was diabetes seen in 23(39%) followed by hypertension in 11(18%) patients. Other causes included were chronic glomerulonephritis hypertension (10;17%), obstructive uropathy (5;8%), IgA nephropathy(3;5%) followed by other. Out of all the patients who were enrolled for our study, 32(54%) were in stage 5 (eGFR< 15) followed by 20(33%) were in stage 4(eGFR 15-29) and (8,13%) were in stage 3(eGFR 30-59). **Conclusion:** In CKD patients DM and hypertension were the most common etiology.

KEYWORDS

Chronic kidney disease, Diabetics mellitus

INTRODUCTION

In 2017, the global burden of CKD disease was 697.5 million and among them India is the second most affected country, with 115 million cases.¹ According to Kidney Disease Outcome Quality Initiative (K/DOQI) of the National Kidney Foundation (NKF) the chronic kidney disease "Kidney damage for three or more months, as defined by structural or functional abnormalities of the kidney, with or without decreased GFR, manifested by pathologic abnormalities or markers of kidney damage, including abnormalities in the composition of the blood or urine or abnormalities in imaging tests OR GFR<60mL per minute per 1.73m² for three months or more, with or without kidney damage".²

Chronic Kidney Disease (CKD) is a complex condition with multiple etiological factors contributing to its development and progression. Diabetes, especially Type 2 diabetic mellitus(DM) , is another major cause of CKD. Afterward, elevated blood sugar levels can damage the small blood vessels in the kidneys, leading to diabetic nephropathy. Similarly, conditions affecting the glomeruli (the tiny filtering units in the kidneys) such as glomerulonephritis can lead to inflammation and damage, contributing to CKD.³ According to the previous study, in India too, diabetes and hypertension today account for 40-60% cases of CKD.⁴ Certain autoimmune conditions, such as lupus (systemic lupus erythematosus), can affect the kidneys and contribute to the development of CKD. Blockages in the urinary tract, such as kidney stones or an enlarged prostate, can lead to obstruction of urine flow and contribute to CKD.⁴ Understanding the interplay of these factors is crucial for preventing, diagnosing, and managing CKD. It's important to note that these factors can often interact, and the progression of CKD. This ultimately may lead to cardiovascular mortality in CKD patients. Therefore, early detection and management of these risk factors are essential in preventing or slowing the progression of CKD.

MATERIALANDMETHODS

This study was conducted in department of medicine at IGMC Shimla, Himachal Pradesh. A total of 60 patients of CKD were enrolled. Study was conducted in patients with age 18 years or more with chronic kidney disease who were willing to participate in the study. Study period for this study was 6 months from 1st Jan 2021 to 30th June 2021.

Data analysis

Data were presented as frequency and percentage in MS excel sheet. Quantitative variables were expressed as Mean ± SD and the qualitative variables were expressed in percentage and proportion. Analysis was done using SPSS version 17.0 (IBM SPSS Statistics Inc., Chicago, Illinois, USA) Windows software program.

RESULTS

Demographic characteristics

A total of 60 patients were included in this observational study. Mean age of the patients was 55.18±14.63 years. There were 60 patients out of which maximum number of patients 16(27%) were in age group of 51-60 years, followed by 15 (25%) patients in age group of 60-70 years. There was female predominance with 34(57%) female and 26(43%) males. Most of patients 40 (67%) were from rural area and 20 (33%) were from urban area.

Etiology

In our study most common etiology for CKD among patients enrolled was diabetes seen in 23(39%) followed by hypertension 11(18%) patients. Other causes included were chronic glomerulonephritis (10; 17%), obstructive uropathy (5;8%), IgA nephropathy(3;5%) followed by other.

Stages of CKD

Out of all the patients who were enrolled for our study, 32(54%) were in stage 5 (eGFR< 15) followed by 20(33%) were in stage 4(eGFR 15-29) and (8,13%) were in stage 3(eGFR 30-59).

Table 1. Demographic Characteristics

Age Range	No of cases	Percentage (%)
20-29	4	7
30-39	6	10
40-49	9	15
50-59	16	27
60-69	15	25
70-79	8	13
80-90	2	3
Address		
Rural	40	67
Urban	20	33
Gender		
Female	34	57
Male	33	43

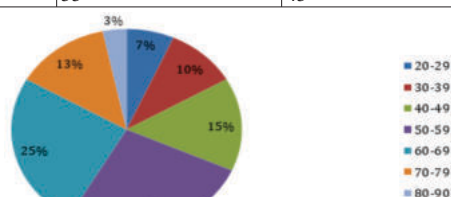


Figure 1. Demographic characteristics

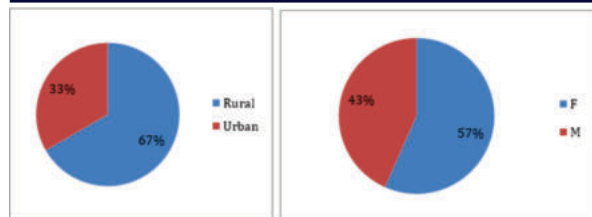


Figure 2.

Table 2. Etiology and CKD Stages

Etiology	No of cases	Percentage (%)
IgA Nephropathy	3	5
ADPKD	2	3
CGN	10	17
CIN	2	3
Diabetics Mellitus	23	39
FSGS	1	2
HTN	11	18
Lupus	2	3
Obstructive Uropathy	5	8
RSD	1	2
CKD Stages		
Stage 3	8	13
Stage 4	20	33
Stage 5	32	54

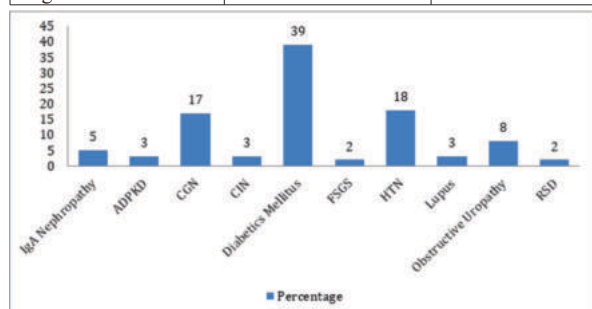


Figure 3. Etiology

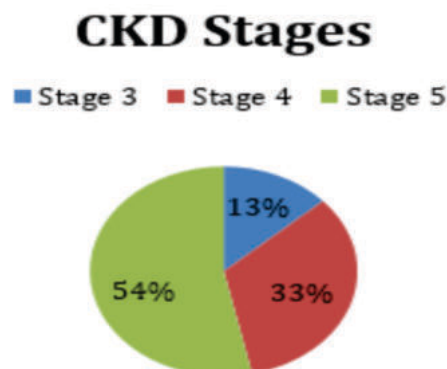


Figure 4. CKD Stages

DISCUSSION

In our study, there were 60 patients out of which maximum number of patients were in age group of 50-59 years, followed by 60-69 years and prevalence of CKD patients fall after 80 yrs of age. Since, age-related renal abnormalities predispose older people to an increased risk of CKD and consequently, the prevalence of older people with CKD is expected to rise.⁵ On the contrary, in our study it was observed that among older people, especially those older than 75 years, as death rate were higher than younger population, thus the prevalence of CKD decreased.⁶

There was female predominance in our study. CKD is a medical condition that can affect both men and women, and its prevalence is influenced by various factors, including age, genetics, lifestyle, and underlying health conditions. Since the autoimmune disease like lupus, and longer life expectancy in women may be responsible for the

greater prevalence of CKD in women.⁷ Most of the patients were from rural area in our study. This is because of geographical distribution of population in this area.

Our study observed that, most common etiology for CKD among enrolled patients was diabetes, followed by Hypertension. Other causes included were chronic glomerulonephritis, obstructive uropathy IgA nephropathy followed by others. Previous studies also found that DM and Hypertension was common cause of CKD.⁸ Another similar study found that the common underlying causes of End stage renal disease were hypertension, diabetes and nephrolithiasis, respectively.^{9,10}

CONCLUSION

The etiology of CKD differs substantially between developed and developing countries and the mechanisms underlying CKD progression may also differ. In developing country like india, possibly due to lifestyle changes and increasing prevalence of obesity, people are at a greater risk of comorbidities such as diabetes, hypertension. Henceforth, with rising prevalence of these diseases in India, prevalence of CKD is expected to rise, and obviously this is the key target population to address.

Further, CKD is a major risk factor for cerebrovascular disease and coronary artery disease, which are the main causes of mortality in this population. Hence, the attention is focused to diagnose and treat kidney disease at an early stage. In the context of early recognition and prevention of renal disease, it is important to analyze the prevalent etiological factors of CKD in a particular population.

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