Research Article

Clinical and biochemical profile of non-diabetic chronic kidney disease patients: A prospective study

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ABSTRACT

Background: Chronic kidney disease (CKD) is one of the raising health issues globally. Patients who are in the last stage (Stage 5) of CKD can only be treated using renal replacement therapy mainly hemodialysis. Patients undergoing hemodialysis often face disturbed routine life and also report dissatisfaction following treatment. **Objectives:** The objectives of this study were to study the clinical and biochemical profile of non-diabetic CKD patients. **Materials and Methods:** A total of 100 CKD patients were studied in the Department of Medicine, GR Medical College and JA Group of Hospitals, Gwalior, from February 2014 to November 2015. After detailed history, complete blood count, blood urea, serum creatinine, serum albumin, total protein, albumin-to-creatinine ratio, and albumin excretion ratio were estimated in all the patients. **Results:** Most of the patients in cases (23%) belong to the age group of 51–60 years with male predominance (56%). The most common symptom was swelling of legs (70%) followed by oliguria (62%), whereas the most common sign was pallor (76%) followed by edema (70%). Most of the patients (61%) were hypertensive. Maximum patients were from glomerular filtration rate G5 category (69%). Most of the patients were of A3 albuminuria category (76%). Mean hemoglobin, blood urea, serum creatinine, total protein, and serum albumin in non-diabetic CKD patients were 8.06 ± 2.34, 156 ± 92.32, 7.56 ± 5.22, 6.11 ± 0.93, and 3.11 ± 0.65, respectively. **Conclusion:** CKD was common in male patients who were in the 6th decade of life. Swelling of legs, oliguria, pallor, and edema were the common signs and symptoms in non-diabetic CKD patients. Awareness regarding the factors responsible for CKD is important to lower the incidence and even delay the progression to end-stage renal disease.

KEY WORDS: Serum Creatinine; Swelling of Legs; Hypertension; Non-diabetic Chronic Kidney Disease

INTRODUCTION

Status of chronic kidney disease (CKD) can be determined using the presence of kidney injury and extent of kidney function. National Kidney Foundation has proposed the criteria for dividing CKD into different stages based on nature of kidney function. Till Stage 4 conservative treatments are usually recommended. As the patient advanced to higher stage which is known as end-stage renal disease (ESRD) where kidneys are not able to maintain body's homeostasis, the last resort for the patients is renal replacement therapy.[1]

Death due to chronic diseases in India was around 5.21 million in 2008. The mortality rate is expected to increase to 7.63 million by the year 2020. CKD is reported to be the 12th leading cause of mortality globally.[2]

In western zone of India, common reasons for CKD are hypertension (14.4%), chronic interstitial nephritis (7.1%), diabetic nephropathy (29.2%), and chronic glomerulonephritis (14.2%). Reports have also shown that CKD of undetermined

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etiology has been reported more in young females and most commonly presented with Stage 5 CKD.[3]

Twice a week hemodialysis is recommended in patients with ESRD. However, most of the Indian patients are not able to afford the hemodialysis cost. Hence, it is more important to pay more attention on its prevention, early detection, evaluation, and management of CKD to prevent decreased kidney function, slow the progression to ESRD.[4,5]

Hence, in the present study, we evaluated clinical and biochemical profile of non-diabetic CKD patients.

MATERIALS AND METHODS

The present study was done with 100 patients in the Department of Medicine, GR Medical College and J.A. Group of Hospitals, Gwalior, from February 2014 to November 2015.

All cases of CKD as defined in the criteria were included in the study. Patients with diabetes mellitus, dyslipidemia/ already on lipid-lowering drug therapy, chronic liver disease, and hypothyroidism were excluded from the study.

A written informed consent was obtained from each subject, and detailed clinical history including complaints, history, personal history, and family history was taken. All the selected patients were subjected to relevant investigations such as complete blood count, blood urea, serum creatinine, serum albumin, albumin-to-creatinine ratio, and albumin excretion ratio.

The clinical criteria are not absolute and are non-specific, occur only in the later stage and are not dependable. The features of uremia include fatigue, lethargy, somnolence, coma, anorexia, nausea, vomiting, hematemesis, gastric ulcers, diarrhea, dysentery, cardiac failure, pericarditis, cardiomyopathy, edema, hypertension, pleuritis, pulmonary edema, pulmonary hemorrhage, anemia, thrombasthenia, purpura, rickets, osteomalacia, osteitis fibrosa, pruritis, and peripheral neuropathy.

Patient was considered as anemic if facial pallor was associated with conjunctival and buccal mucous membrane pallor and nail pallor. It was later confirmed by hemoglobin estimation. Anemia was defined hemoglobin level of <13 g/dl in males and <12 g/dl in females. Edema was considered as present when the pitting was demonstrated which persisted for more than 30 s. Hypertension is defined as blood pressure (BP) >140 mmHg for systolic BP and/ or >90 mmHg for diastolic BP. Oliguria is defined as urine output <400 ml/24 h or <0.5 ml/kg/h in study population. Glomerular filtration rate (GFR) was calculated on the basis of CKD-EPI equation.

All the data were analyzed using IBM SPSS ver. 20 software. Cross tabulation and frequency distribution were used to prepare table. Microsoft Excel 2017 was used to prepare graphs. Quantitative data are expressed as mean ± standard deviation and results on categorical measurements are presented in number (%). Quantitative and categorical data were analyzed using Student's *t*-test and Chi-square test, respectively. Level of significance was assessed at 5% level.

RESULTS

Most of the patients in the study cohort (23%) belong to the age group of 51–60 years, and 56% were male [Figure 1].

DISCUSSION

CKD is increasing at an alarming rate worldwide and so its mortality and morbidity, which makes it an important public health problem. The mortality and morbidity with pre-dialysis CKD, which is predominantly cardiovascular, are up to 5.4 times higher compared with general population with estimated GFR within normal range.[6] According to CKD fact sheet,[7] incidence of CKD increases with age because risk factors for CKD also increase with age.

In the present study, majority of patients were in the age group of 51–60 years (23%). The mean age of patients was 47 ± 16 years (range 14–81 years). Kayima *et al*.[8] showed similar age distribution of patients in their study. Avasthi *et al*.[9] reported that mean age of patients and controls was 51.17 ± 13.53 (range 22–70 years) and 49.80 ± 15.20 (range 21–75 years), respectively. Hida *et al*.[10] also had

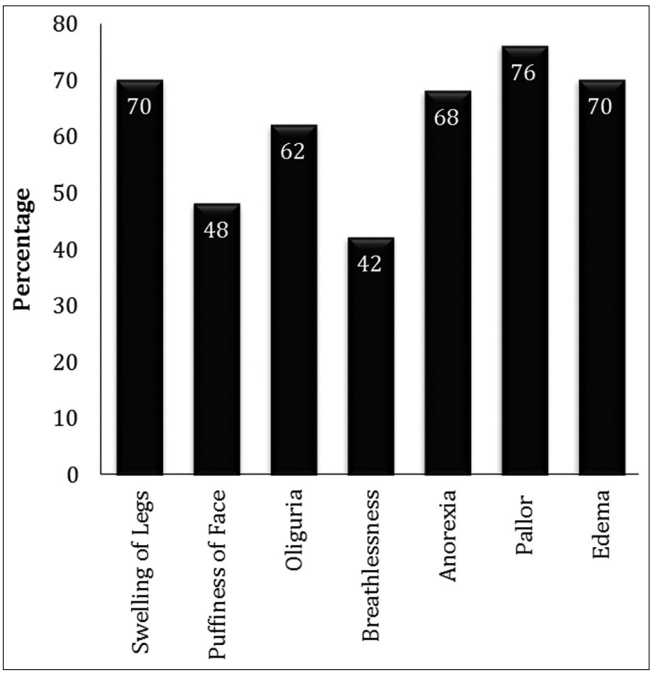

Figure 1: Distribution of CKD patients according to clinical profile

Table 1: Comparing different parameters in the study cohort

Parameters	Cases (*n*=100)
BP (mmHg)	
<120/80	13
120–139/80–89	20
>140/90	60
<90	7
GFR category	
G1	1
G2	2
G3a	9
G3b	8
G4	10
G5	70
Albuminuria category	
A1	2
A2	21
A3	77

Data are expressed as percentage,
GFR: Glomerular filtration rate, BP: Blood pressure

Table 2: Biochemical profile in the study cohort

Parameter	Cases (n=100)	
	Range	Mean±SD
Hemoglobin	02–14.2	8.06±2.34
Blood urea	16–252	156±92.32
Serum creatinine	0.96–26.1	7.56±5.22
Total protein	3.6–7.8	6.11±0.93
Serum albumin	1.2–5.4	3.11±0.65
Blood urea (mg/dl)*	0–50	11
	51–100	20
	101–150	21
	151–200	34
	201–250	11
	>250	3
Serum creatinine (mg/dl)*	<2	21
	2–4.99	21
	5–9.99	26
	10–14.99	22
	≥15	10

Data are expressed as mean±SD, *data are expressed as number of patients. SD: Standard deviation

same findings. Ganta *et al*. studied 140 CKD patients and reported that the mean age of the population of the study was 55.14 ± 12.27 years.[11] Rajapurkar *et al*. showed that mean age for CKD in western zone of India was 50.2 ± 14.9 years with male-to-female ratio of 69:31.[12] In the present study, male outnumbered females in 56%, giving male-to-female ratio of 1.27:1. Lim *et al*.[13] studied 46 patients of CKD, out of which 56.22% were male and maximum patients were of the age group of 29–59 years with a mean age of 42.8 ± 6 years. The results correlate with the previous studies conducted by Kayima *et al*.[8] and Avasthi *et al*.[9] The most common symptom in the present study was swelling of legs (70%) followed by anorexia in 68% of patients. Apart from this, puffiness of face and oliguria was present in 48% and 42% patients, respectively. The most common sign was pallor which was present in 76% patients and edema was present in 70% of patients. Findings are similar to Prasad and Murthy.[14] In a similar study by Pathak *et al*., the most common clinical features were dyspnea (63.0%), pedal edema (31%), high BP (54.0%), pallor (49.0% [$P < 0.001$]), and pedal edema (31.0%).[15] It has been cited by Ridao *et al*.[16] that hypertension was present in 70–80% of CKD patients. In the present study, hypertension was present in 61% of patients and 19% patients were prehypertensive. Pathak *et al*. reported that 38.0% had hypertension.[15] In the present study, mean blood urea of patients of CKD was 156 ± 92.32 mg/dl (range 16–252 mg/dl). Thomas *et al*. reported similar findings where[17] mean serum creatinine in patients of CKD was 7.56 ± 5.22 mg/dl (range 0.96–26.1 mg/dl) as compared to control 0.64 ± 0.23 mg/dl. Sarnak *et al*. in their study reported similar results.[18] Maximum patients were in G5 GFR category, i.e., 69% while G1 and G2 category had 1% and 2% patients, respectively. According to Indian CKD registry data 2010,[12] only 1–5% patients present in Stages 1 and 2 while 60–80% patients present in Stage 5. KDIGO guidelines[19] recommend that all stages of CKD be considered as CHD risk equivalent. Hence, timely proper intervention needs to be taken in patients with renal dysfunction. This includes implementation of lifestyle modification in the form of diet control, increasing physical activity, smoking cessation, and moderation of alcohol consumption with or without drug therapy. Further, large randomized trial will provide more definitive data on the risk and benefits of lipid-lowering therapy in this population.

Most of the patients presented in Stages 3, 4, or 5 (G3, G4 or G5) of CKD. Hence, there is a need for further large-scale study to extrapolate this data on much larger population of CKD patients.

CONCLUSION

The present study data have shown that CKD was more common in male patients who were in the 6th decade of life. Swelling of legs, oliguria, pallor, and edema were the most common signs and symptoms in non-diabetic CKD patients. Hypertension was the leading causes of CKD. Reports have shown that CKD also increases the risk CVD. Same can be decreased by health awareness program. Proper education and prevention can postpone the development of ESRD. Using different means of evaluation and using proper therapeutic interventions can delay the progression and also decrease the morbidity.

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