Original Research Article

Study of clinical profile of chronic kidney disease (CKD) patients at a tertiary care center

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Abstract

Background: Chronic kidney disease (CKD) may be caused by different etiologies and the prevalence in the adult population is estimated to be between 8–16%. CKD increases patient morbidity and mortality mainly due to progression to end-stage renal disease and a disproportionate increase in the risk of cardiovascular disease (CVD). End-Stage Renal Disease (ESRD), the most advanced stage, when the kidneys can no longer maintain homeostasis of the body, the patient will depend on dialysis or kidney transplant. Present study was aimed to study clinical profile of chronic kidney disease (CKD) patients presenting in a tertiary care center. **Material and Methods:** This study was a prospective, observational type, conducted in patients with CKD, >18 years age taking treatment in our tertiary care center. **Results:** In present study total 135 patients were included. Most common age group involved was 40-59 years (41 %), followed by age group ≥60 years (30 %). In present study mean±SD was 47.57 ± 11.43 years. Male patients outnumbered female (61 % male, 39 % female). Male to female ratio was 1.6:1. For age mean±SD in male patients was 48.26 ± 11.93 years, while it was 46.32 ± 10.14 years in female. In patients with CKD, we noted hypertension (47%), diabetes (35%), anemia (30%), hyperlipidemic disease (26%) and coronary artery disease (10%) were common co-morbidities present. 19 % patients had no major medical co-morbidity present. Hypertensive nephropathy (44%), chronic glomerulonephritis (27%) and diabetic nephropathy (19%) were most common etiologies noted in present study. Other less common etiologies were Tubulo-intestitial disease (1%), ADPKD (1%), Obstructive uropathy (2%), Miscellaneous (3%) and Unknown (1%).Renal function has been graded according to the Kidney Disease Outcomes Quality Initiative guidelines. We noted 0%, 36%, 30%, 21% and 13% Patients of stage 1,2,3,4 and 5 respectively. **Conclusion:** Periodic screening is must in patients with one or more co-morbid conditions (e.g. hypertension, diabetes melitus,etc) so as to prevent CKD. India needs more kidney care centers to provide dialysis, renal transplant facilities for increasing population of CKD.

Key Word: Chronic Kidney Disease (CKD), End Stage Renal Disease (ESRD), co-morbidities

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INTRODUCTION

Chronic kidney disease (CKD) is defined as kidney damage or glomerular filtration rate below 60 mL/min per 1.73 m2 for three months or more, irrespective of the cause[1]. Chronic kidney disease (CKD) may be caused by different etiologies and the prevalence in the adult population is estimated to be between 8–16%[2,3]. The Global Burden of Disease (GBD) study 2015[4] ranked chronic kidney disease 17th among the causes of deaths globally (age standardised annual death rate of 19·2 deaths per 100 000 population). In many countries, chronic kidney disease is now among the top five causes of death. In India, GBD 2015 ranks chronic kidney disease as the eighth leading cause of death. Although the exact incidence and prevalence rates are not available, it is estimated that one out of 10,000 people suffer from CKD in India and around 100 thousand new patients develop End Stage Renal Disease (ESRD) in India annually[5]. Increased prevalence of CKD could be partly explained by the high prevalence of risk factors like diabetes and hypertension in the screened population (18.8% and 431.1%, respectively). The prevalence of diabetes and hypertension in India varied widely in many studies and ranged from 6-20% and 13-58%, respectively [6,7]. CKD increases patient morbidity and mortality mainly due to progression to end-stage renal disease and a

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disproportionate increase in the risk of cardiovascular disease (CVD). End-Stage Renal Disease (ESRD), the most advanced stage, when the kidneys can no longer maintain homeostasis of the body, the patient will depend on dialysis or kidney transplant. A vast proportion of kidney failure patients in the developing world, including India, die without receiving renal replacement therapy[8]. Present study was aimed to study clinical profile of chronic kidney disease (CKD) patients presenting in a tertiary care center.

MATERIAL AND METHODS

This study was a prospective, observational type, conducted in department of medicine, at XXX medical college, XXX, a tertiary care center. Study period was from October 2018 to October 2019. Institutional Ethics Committee clearance was obtained. CKD was defined by criteria set by National Kidney Foundation. Kidney Disease Outcome Quality Initiative for diagnosing CKD[9]. GFR was calculated on the basis of Modification of Diet In Renal Disease (MDRD) formula[10]. MDRD (Modification of Diet in Renal Disease) derived eGFR calculated using the formula as follows: eGFR = 186 × (SCR × 0.011)$^{-1.154}$ × (age)$^{-0.203}$ × (0.742, if female) × (1.210 if African American) (SCR- serum creatinine expressed as µmol/L).

Inclusion criteria:

Patients with CKD in our institute, >18 years age were enrolled in present study. This included Out Patient Department (OPD) patients coming for follow up, indoor patients with complications of CKD, patients referred from other departments in initial stages of CKD during the routine investigations.

Exclusion criteria:

1. Patients below the age of 18 years,
2. CKD with malignancy and liver disorders
3. patients of CKD who were already registered for renal transplantation and awaiting renal transplantation

A written informed consent was taken from all the patients. Patients were subjected to detailed history taking and clinical examination. Routine laboratory investigations in the form of Complete Blood count (CBC), Kidney Function Tests (KFT), Liver Function Tests (LFT), Serum electrolytes, Ultrasonography (USG) abdomen with pelvis, renal doppler, Electrocardiogram (ECG), Urine routine, were done in all the patients. Special Investigations like 2D Echocardiography, CT/MRI abdomen + pelvis,fundoscopy, etc were done in whenever needed. Etiological diagnosis was made on the basis of history, clinical examination, and investigations. Records of renal biopsy wherever available were used to make help in diagnosis. Once the patients were labelled with CKD, they were further categorized in to different stages of the CKD on the basis of GFR. These patients were observed for their epidemiological profile, clinical features, progression of renal disease, aetiology of CKD, and the treatment modality received. All data was collected in pre-designed format and analysed with Microsoft excel.

RESULTS

In present study total 135 patients were included. Most common age group involved was 40-59 years (41 %), followed by age group ≥60 years (30 %). In present study mean±SD was 47.57 ± 11.43 years. Male patients outnumbered female (61 % male, 39 % female). Male to female ratio was 1.6:1. For age mean±SD in male patients was 48.26 ± 11.93 years, while it was 46.32 ± 10.14 years in female.

Table 1: Age and sex distribution of the study population

Age (in years)	Male	Female	Total
19 - 39	23 (17%	15 (11%)	38 (28%)
40 - 59	35 (26%)	21 (16%)	56 (41%)
≥60	24 (18%)	17 (13%)	41 (30%)
Total	82 (61%)	53 (39%)	135
Mean±SD (in years)	48.26 ± 11.93	46.32 ± 10.14	47.57 ± 11.43

In patients with CKD, we noted hypertension (47%), diabetes (35%), anemia (30%), hyperlipidemic disease (26%) and coronary artery disease (10%) were common co-morbidities present. 19 % patients had no major medical co-morbidity present.

Table 2: Co-morbidities

Comorbidities	No of patients	Percentage
No comorbidity	26	19%
Hypertension	64	47%
Diabetes	47	35%
Anemia	41	30%
Hyperlipidemic disease	35	26%
Coronary artery disease	13	10%

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Hypertensive nephropathy (44%), chronic glomerulonephritis (27%) and diabetic nephropathy (19%) were most common etiologies noted in present study. Other less common etiologies were Tubulo-intestitial disease (1%), ADPKD (1%), Obstructive uropathy (2%), Miscellaneous (3%) and Unknown (1%).

Table 3: Etiological diagnosis of the study population

Etiology	Male	Female	Total
Hypertensive nephropathy	34 (25%)	26 (19%)	60 (44%)
CGN	23 (17%)	14 (10%)	37 (27%)
Diabetic Nephropathy	17 (13%)	9 (7%)	26 (19%)
Tubulo-intestitial disease	1 (1%)	1 (1%)	2 (1%)
ADPKD	1 (1%)	1 (1%)	2 (1%)
Obstructive uropathy	2 (1%)	1 (1%)	3 (2%)
Miscellaneous	3 (2%)	1 (1%)	4 (3%)
Unknown	1 (1%)1%	0	1 (1%)
	82 (62%)	53 (39%)	135

Renal function has been graded according to the Kidney Disease Outcomes Quality Initiative guidelines. We noted 0%, 36%, 30%, 21% and 13% Patients of stage 1,2,3,4 and 5 respectively.

Table 4: distribution according to stage of CKD

Stage	GFR (ml/min/1.73 m2)	No of patients	Percentage
1	>90	0	0%
2	60-89	49	36%
3	30-59	41	30%
4	15-29	28	21%
5	<15	17	13%

DISCUSSION

Low- and middle-income countries have the greatest burden of CKD, accounting for 80% of all cases of CKD globally[11]. Data on CKD in developing countries are scanty, invalidated, and heterogeneous, making comparisons difficult. In the SEEK-India, the prevalence was 17.2% and was higher in males (>60%)[12]. The GBD 2013 report specifically highlighted "Important gaps exist in empirical data for cause of death estimates for some countries; for example, no national data for India is available for the past decade"[13]. Earlier studies in limited geographical areas in India have shown that the prevalence of CKD was less than 1%[14], whereas in a study in rural parts of Karnataka, India, reported a growing prevalence of CKD as 6.8%[15]. Higher prevalence of CKD in the elderly population has been attributed to the fact that renal function declines with age. We noted mean±SD age in our study was 47.57 ± 11.43 years. Rajapurkar *et al*[16]., found that mean age for CKD in western zone of India is 50.2 ± 14.9 years. In present study 61% patients were male and 39% were female. Male to female ratio in this study was 1.65:1 showing male predominance. In the study done by M MRajapurkar, George T John and Ashok Kirpani *et al*[16], they observed Male to Female ratio as 2.3:1. While Ajay K Singh, Youssel M K, Bharari V Mittal *et al* found that male to female ratio was 1.2:1[17]. Regarding etiology of CKD, hypertensive nephropathy (44%), chronic glomerulonephritis (27%) and diabetic nephropathy (19%) were most common etiology noted in present study. Chaudhari *et al*[18]. found diabetic nephropathy (32.0%), hypertensive nephropathy (20.0%) and chronic glomerulonephritis (10.0%) were the most common etiology of CKD. Sathyan *et al*[19]. found CGN (51.0%) and diabetic nephropathy (22.0%) as the most common etiologies of CKD. Jha *et al*[20]. in their study found that diabetic nephropathy (31.2%) and hypertensive nephropathy (12.8%) were the most common etiologies of CKD. Common causes of CKD in western zone in India are Diabetic nephropathy 29.2%, Hypertensive nephrosclerosis 14.4%, chronic glomerulonephritis 14.2%, chronic interstitial nephritis 7.1%, Obstructive uropathy 4%, ADPKD 2.9% and undetermined etiology in 15.7%. Patients with CKD of unexplained etiology were younger, had more females and more frequently presented in Stage V[16]. Renal function has been graded according to the Kidney Disease Outcomes Quality Initiative guidelines as stages of diabetic nephropathy[11,12].

Table 4: Stages of CKD and management

Stage	GFR (ml/min/1.73m2)	Description	Management
1	>90	Normal or increased GFR with another evidence of renal damage	Screening CKD and risk reduction
2	60-89	Slightly decreased GFR with another evidence of renal damage	Diagnosis and treatment: slow progression of CKD; comorbidities and cardiovascular disease; risk reduction
3a	45-59	Moderately decreased GFR without evidence of renal damage	Evaluate and treat complication
3b	30-44	Irreversible renal damage	
4	15-29	Severely decreased GFR without evidence of renal damage	Prepare for renal replacement therapy
5	<15	Established renal failure	Renal replacement if uremic

It has been estimated that the prevalence of ESRD will rise over the next decades, driven by population aging, and increasing prevalence of diabetes mellitus and hypertension[21]. Hypertension is a cause of CKD, but it can be effect of CKD also. Multiple factors are present in hypertensive patients leading to CKD. Increasing cases of hypertension ae noted due to stress, obesity, lack of exercise, smoking, etc. Diabetes mellitus (DM) is the one of the most common cause of CKD worldwide and in India. Approximately 30% of the patients with DM have diabetic nephropathy, and with the growing number of DM patients and aging population, there is likely a parallel increase in the incidence of CKD. Rajapurkar *et al*16 noted the prevalence of diabetic kidney disease as 14.6%, which is in stark contrast to the data from the Indian CKD registry in which diabetic nephropathy was the preeminent cause of CKD in 31% of patients. In our study, 2 percentage of CKD was due to obstructive uropathy. Common causes of obstructive uropathy are calculus, renal disease, congenital pelvic–ureteric junction obstruction, cervical malignancy and benign prostatic hyperplasia which are related to age and sex of the patients. Stressors like poly-pharmacy, dietary constraints, fear of death, dependency upon treatment may affect quality of life and feeling of loss of control in CKD patients[22]. Depression affects self-care of the CKD patients that affects compliance to the medications and diet[23]. There is also evidence that, because of lack of medical facilities ,poor control of risk factors, and delayed referral to the nephrologists ,there is much more rapid progression of CKD in the Indian population than in developed countries[24].

CONCLUSION

Chronic kidney disease is a serious condition, requiring proper medical attention. Periodic screening is must in patients with one or more co-morbid conditions (e.g. hypertension, diabetes melitus,etc) so as to prevent CKD. India needs more kidney care centers to provide dialysis, renal transplant facilities for increasing population of CKD.

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