



**ORIGINAL RESEARCH PAPER**

**General Medicine**

**STUDY OF CLINICAL PROFILE OF THE PATIENT WITH CHRONIC KIDNEY DISEASE UNDER HEMODIALYSIS**

**KEY WORDS:** electrolyte abnormality, chronic kidney disease, hemodialysis, mortality

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**ABSTRACT**

**Background:** Chronic kidney disease (CKD) in initial stages is usually asymptomatic. Recognition of CKD using clinical profile can assist in early interventions to delay the progression to ESRD and reduce morbidity and mortality.

**Aims and Objectives:** To study the clinical profile of patients with CKD under hemodialysis.

**Materials and Methods:** Hundred CKD patients having age >18 years were studied at Department of general medicine, Gandhi Medical College, & associated Hospitals (Hamidia Hospital) Bhopal from 2017 to 2020. Viral markers, CBC, fasting and post prandial blood sugar, serum electrolytes, serum urea and creatinine, Liver function test, serum profile, coagulation profile, ECG and Chest X ray was performed.

**Results:** CKD was more prevalent in age group of 20-30 years (29%) who were males (65%). Majority had stage 4 CKD. 14% had abnormal serum creatinine level, 73% had abnormal blood urea level and 21% had abnormal potassium levels. Majority had abnormal (55%) serum calcium level and only 2% had abnormal uric acid level.

**Conclusion:** Electrolyte disturbances are commonly associated with the patients with CKD. Abnormal serum creatinine and urea is the important predictor of the CKD. Early recognition can reduce the progression to further complications.

**INTRODUCTION**

Chronic kidney disease (CKD), a continuum of kidney disease ranging from mild damage to end-stage renal disease (ESRD) is a major public health problem globally associated with increased morbidity and mortality. (Rahman M 2004)

Previous reports suggest that CKD in initial stages is in general asymptomatic. Clinical manifestations of CKD start to appear only from stage 3 onwards. It is, therefore very important to diagnose and begin interventions early in CKD patients thereby delaying the progression to ESRD and reducing morbidity and mortality. (Halle MP 2015)

Recommendations suggest twice a week hemodialysis in patients with ESRD. (Fivush BA 1998) However, due to non-affordability most of the patients do not undergo hemodialysis. Efforts to prevent the progression to ESRD is possible with early detection, evaluation, and management of CKD and associated conditions can prevent future complications of decreased kidney function and slow the progression of kidney disease to kidney failure. (Inker LA 2014)

There is paucity of Indian studies depicting clinical profile of CKD. Hence in present study we tried to evaluate the clinical profile of patients with CKD.

**MATERIALS AND METHODS**

Present prospective observational, cross sectional study was performed on 100 patients at Department of general medicine, Gandhi Medical College, & associated Hospitals (Hamidia Hospital) Bhopal from 2017 to 2020.

All patients of chronic kidney disease having age more than 18 years and on maintenance hemodialysis were included whereas patients having age < 18 years were excluded from the present study. Viral markers, CBC, fasting and post prandial blood sugar, serum electrolytes, serum urea and creatinine, Liver function test, serum profile, coagulation profile, ECG, Chest X ray and Nerve conduction studies were performed and results were recorded.

All the data analysis was performed using IBM SPSS ver. 20 software. Frequency distribution and cross tabulation was performed to prepare the tables. PRISM and Microsoft excel was used to prepare the tables. Categorical data was

expressed as number and percentage. Chi square test was used to compare the categorical data. Level of significance was assessed at 5%.

**RESULTS**

CKD was more prevalent in the age group of 20 to 30 (29%) followed by 31 to 40(22%), 41 to 50(20%) and 51 to 60(20%). CKD was more prevalent in male population (65%). On comparing the CKD stages based on EGFR, majority of the patients had stage 4 followed by stage 5 and stage 3.

On comparing the blood creatinine serum level, majority (86%) of patients had normal levels and 14% had abnormal levels. On comparing the blood urea level, majority (73%) of patients had abnormal levels (>20 mg/dL) and 27% had normal. On comparing the blood sugar level in terms of FBS and PPBS, majority of the patients had FBS normal (73%) and 27% were diabetic. On PPBS test, majority of CKD patients had sugar at normal (51%) levels, followed by pre-diabetic (34%) and 15% were diabetic.

On present study on comparing various serum electrolyte levels we found that the majority of the patients had potassium levels as normal (79%) and 21% had above 5.0 mmol/L.

Preponderance of female (31.43%) over male (15.38) patients was observed in abnormal potassium levels. We observed calcium levels were normal in 45% and majority (55%) had calcium level above 7.5 mmol/24. Phosphorus was normal in 52% and abnormal in 48%. In majority patients, uric acid levels were normal (98%) and above 8 mg/dL in only 2% i.e. 3.08% male subjects.

**DISCUSSION**

Lack of health awareness and lack of regular health checkup in general population is one of the culprit factors for progression of renal disease. Health awareness in general population may decrease the incidence of ESRD or postpone the development of ESRD.

In present study, CKD was more prevalent among males (65%) as compared to females (35%). In line with present study findings, Jasti et al reported that majority of the CKD patients were male (67.5%). (Jasti DB 2017) Similarly, another study by Anbarasu et al including 60 CKD patients reported that

majority were males (58.0%) than females (42.0%). (Duraisamy Anbarasu 2018) Prashanth studied 100 CKD cases and found that there were (58.0%) males and (42.0%) females. (Sai Prashanth P R 2018)

In present study, CKD was more prevalent in the age group of 20 to 30 (29%) followed by 31 to 40(22%), 41 to 50(20%) and 51 to 60(20%). In agreement to that Anbarasu et al reported that majority of patients (40%) had age between 21-50 years, followed by age group of 50 - 60 years (28.4%), > 60 years (18.4) and only 13.2% patients had age <30 years. (Duraisamy Anbarasu 2018) Prashanth reported a mean age of 47.87 years for the enrolled CKD patients. Most of the patients belonged to the age group 40-70 years. (Sai Prashanth P R 2018) In a similar series by Babu et al, most of the patients (28.37%) were in the age group 35-44, followed by 45-54 (22.97%), 25-34 (16.21%) and 65-74 (14.08%). (Babu MM 2015)

On comparing the CKD stages based on EGFR, majority of the patients had stage 4 followed by stage 5 and stage 3 in present series. In agreement to present study, Aggarwal et al found that majority of patients were in the stage 3 CKD followed by stage 1 and stage 4. (Hari K Aggarwal 2013) Chao et al in their study observed that majority of kidney patients were in the stage 5 (80%), followed by stage 4 (15%) and 5% patients were in stage 3. (Chao C 2011) Prashanth compared the CKD stages based on EGFR and noted that most of patients in the Stage 5 (79%) followed by Stage 4 (17%), Stage 3 (4%). (Sai Prashanth P R 2018)

In our study on comparing the blood creatinine serum level majority (86%) of patients had normal levels and 14% had abnormal levels. In a similar series by Jasti et al mean serum creatinine of 200 predialysis patients was  $4.9 \pm 2.6$  mg/dL. (Jasti DB 2013) In the study of Prashanth, patients who had serum creatinine levels between 1.5-3 mgs%, 3 patients had peripheral neuropathy (27.27% prevalence). In patients who had serum creatinine between 3.1 to 6.0 mgs%, 41 patients (65.07% prevalence) had uraemic neuropathy and in patients who had serum creatinine between 6.1 and 9 mgs%, 12 patients had uraemic neuropathy (66.66% prevalence). (Sai Prashanth P R 2018) Aggarwal et al observed mean serum creatinine (mg/dL) was 3.81-1.35. 40% of patients had Serum creatinine values between 2 and 3.4, 37% with serum creatinine values between 3.5-4.9. (Hari K. Aggarwal 2013)

In present study on comparing the blood urea level majority (73%) of patients had abnormal levels i.e. above 20 mg/dL and 27% had normal. In Jasti et al study the mean blood urea of 200 predialysis patients was  $95.7 \pm 53.2$  mg/dL. (Jasti DB 2017) Aggarwal et al observed mean blood urea (mg/dL) was 106.03. (Hari K Aggarwal 2013) Routine hemodialyses have found not to improve neuropathy in patients with CKD despite decrease in urea and creatinine levels, this was emphasised by many authors. (Tyler HR 1968, Neilson VK 1973)

In current study on comparing the blood sugar level in terms of FBS and PPBS, majority of the patients had normal FBS (73%) and 27% were diabetic. On PPBS test majority of patients had sugar at normal (51%) levels, followed by pre-diabetic (34%) and 15% were diabetic. In Jasti et al study showed diabetic patients (97%) showed more severe and high prevalence of peripheral neuropathy when compared to non-diabetic patients (83%). (Jasti DB 2017) In Moorthi et al study participants with CKD had higher prevalence of diabetes (20.6%) as compared to non- diabetes (13.1%) at significant  $P < 0.001$ . (Moorthi RN 2019) Mukhopadhyay et al recorded that 29 (49%) patients were diabetic CKD. (Pinaki Mukhopadhyay 2016)

In present study on comparing various serum electrolyte levels it was found that the majority of the patients had normal (79%) potassium levels and 21% had potassium levels above

5.0 mmol/L. We observed calcium levels were normal in 45% and majority (55%) had calcium level above 7.5 mmol/24. Phosphorus was normal in 52% and abnormal in 48%. In majority patients, uric acid levels were normal (98%) and above 8 mg/dL in only 2% i.e. 3.08% male subjects. Thomsen et al in similar study found that out of 157 766 patients with CKD, 28% experienced hyperkalemia, for an overall hyperkalemia incidence rate of 70/1000 person-years. Among patients with Stage 3A, 3B, 4 or 5 CKD, 9, 18, 31 and 42%, respectively, experienced hyperkalemia within the first year. (Reimar W Thomsen 2018) Hans et al recorded that among 191,964 eligible CKD patients, 86,691 (45.16%), 30,629 (15.96%) and 9440 (4.92%) experienced at least one hyperkalemia episode, when defined using serum potassium concentrations  $5.0 < 5.5$  mmol/L,  $5.5 < 6.0$  mmol/L and  $\geq 6.0$  mmol/L, respectively. (Hans Furuland 2018)

Present study has some limitations in terms of small sample size, single centered and cross sectional due to which the cohort is not the actual replica of the real population. Also in this study we have not factored the smoking and alcohol consumption which have significant impact on kidneys.

### CONCLUSION

CKD was more prevalent in males over females. Most common age group involved was young working age group of 20-30 years. CKD stage 4 was the most common followed by stage 5 and 3. Electrolyte disturbances like hyperkalemia are prevalent in patients with CKD. So it should be monitored regularly to avoid life threatening arrhythmias. Hypocalcemia, hyperphosphatemia and hyperuricemia are also associated with CKD. So they should be watched for regularly and should be treated as soon as possible. Abnormal serum creatinine and urea is the important predictor of the CKD.

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