

A Study on Etiology of Chronic Kidney Disease among Young Patients in Jahurul Islam Medical College Hospital, Kishoregonj.

*MRA Chowdhury¹, BU Bhuiyan², S Saad³, MMR Siddiqui⁴, I Jaben⁵, S Kabir⁶

ABSTRACT

Background and objectives: Chronic kidney disease (CKD), an important, chronic, noncommunicable disease is now one of the major public health problems in our country. Early detection of CKD is crucial to prevent its progression, and thereby, to potentially improve its outcome. Number of young patients with CKD are increasing day by day. Only a few studies are done in our country to assess etiology of CKD in young patients. This study was aimed to assess the etiology of CKD in young patients.

Materials and Methods: Data were collected from 150 patients of CKD between 15- and 40-years age who presented to Jahurul Islam Medical College Hospital, Kishoregonj from Jan 2015 to Dec 2019. They were clinically evaluated and underwent relevant investigations including renal biopsy in indicated cases.

Results: In this study, there was an overall male preponderance (60.67%) with age range of 31-35 years (32%). Most common symptoms of presentation were related to gastrointestinal disturbances (70%), breathlessness (66%), easy fatigability (62%), and urinary disturbances (56%). Pallor, pedal edema and facial puffiness were major clinical features. Small kidneys were seen in 65.33% of patients. 90% of patients had proteinuria. Majority (46.67%) had CKD of unknown etiology. In this unknown etiology patients, most of them were found to have chronic glomerulonephritis based on clinical presentation and other supporting investigations. Diabetic nephropathy and obstructive uropathy were found in 13.33% patients. 80% patients were presented in stage IV and stage V CKD. Histopathologically, etiology was proven among 46 patients (30.67%) with renal biopsy.

Conclusion: It is concluded that male patients in the second and third decades were in the majority requiring medical care. Chronic Glomerulonephritis of unknown causes constitutes a major etiology among the young presenting in late stages of CKD.

Key words: Chronic kidney disease, chronic glomerulonephritis, etiology, young patients.

Introduction:

Chronic kidney disease (CKD) has become a major cause of morbidity and mortality in developing countries. 16-20% of our total population are affected by Chronic kidney disease and even in America, it affects up to 20 million of their total population.

The kidney disease outcomes quality initiative of National Kidney Foundation¹ defines CKD as either

kidney damage or decreased glomerular filtration rate <60 mL/min/1.73 m² for 3 or >3 months. Kidney damage is defined as pathological abnormalities or markers of damage, including abnormalities in blood or urine tests or imaging studies. Kidney failure is defined as either (1) a level of glomerular filtration rate (GFR) to <15 mL/min/1.73 m²,

¹Dr. Md. Rashed Alam Chowdhury, Associate Professor, Dept. of Medicine, Jahurul Islam Medical College Hospital

²Prof. Dr. Bahar Uddin Bhuiyan, Professor and Head of Dept. of pathology Jahurul Islam Medical College Hospital

³Dr. Sanjeeda Saad, Assistant Professor, Dept. of Surgery, Jahurul Islam Medical College Hospital

⁴Dr. Md. Mahmudur Rahman Siddiqui, Associate Professor, Dept. of Medicine, Anwer Khan Modern Medical College Hospital

⁵Dr. Irena Jaben, Medical Officer, Dept. of Medicine, Jahurul Islam Medical College Hospital

⁶Dr. Sazia Kabir. Medical Officer, Dept. of Medicine, Jahurul Islam Medical College Hospital

*Corresponding Author

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which is accompanied in most cases by signs and symptoms of uremia, or (2) a need for initiation of kidney replacement therapy (dialysis or transplantation) for treatment for complications of decreased GFR, which would otherwise increase the risk of mortality and morbidity².

CKD is of diverse etiology like diabetic nephropathy, hypertensive nephrosclerosis, chronic glomerulonephritis, chronic interstitial nephritis, chronic pyelonephritis, SLE, Prolonged use of NSAIDs, obstructive uropathy, renovascular, genetic mediated. A comprehensive understanding of the prevalence of CKD and its risk factors is, therefore, necessary in different people from different areas.

Patients with CKD stage III B or lower (GFR \geq 30 mL/min) generally are asymptomatic and do not experience clinically evident disturbances in water or electrolyte balance or endocrine or metabolic derangements. In general, these disturbances clinically manifest with CKD stages IV and V (GFR <30 mL/min).

MATERIALS AND METHODS

A prospective study of 150 adult patients between 15- and 40-years age group with chronic renal failure was undertaken after ethical clearance and with informed consent at Jahurul Islam Medical College Hospital, Kishoregonj January 2015 to December 2019. Patients with age <15 years and >40 years and with acute kidney injury were excluded. After obtaining a detailed history, general physical examination, systemic examination, patients were subjected to relevant investigations. Random blood sugar, blood urea, serum creatinine, complete blood picture, serum electrolytes, complete urine examination, serum calcium, phosphate, total proteins, albumin, ultrasound abdomen, hepatitis B surface antigen (HBsAg), hepatitis C virus (HCV), chest X-ray, electrocardiography and renal biopsy were done wherever indicated. Creatinine clearance (CrCl) can be calculated using Cockcroft-Gault formula³ and modification of diet in renal disease study formula³. In this study, Cockcroft-Gault formula is used for calculating creatinine clearance. Antinuclear antibodies (ANA), double stranded DNA antibody levels, serum complement levels were performed in suspected patients. Renal biopsy was performed in outside institution and was sent for

analysis to outside lab in view of unavailability of immuno- fluorescence and other stains in our institution and results were interpreted.

RESULTS

A total of 150 patients fulfilling inclusion criteria were studied over a period of 5 years. Age group included was 15-40 years and the majority of the affected were within age range of 31-35 (32%). Male:female ratio was 1.54: 1 showing males (60.67%) affected more than females (39.33%). Gastrointestinal tract disturbances (70%), breathlessness (66%), easy fatigability (62%) and oliguria (56%) were the most common symptoms of presentation. Among the signs of chronic renal failure, pallor (86%) was found in majority followed by pedal edema (80%) (Table III), facial puffiness (60%), pulmonary edema (46%). Anemia was noted in 86% of subjects with hemoglobin less than 10 (g/dL). Uremia was noted in 80% of patients. Serum creatinine was >3 mg/dL in 100% patients. Complete urine analysis showed proteinuria in 90%. RBC and RBC cast were found in 46.67% of the patients. Hyperglycemia was found in 13.33% patients. Hyperphosphatemia was found in 66% patients. Based on CrCl rate, most of the patients were in stage IV (28.67%) and stage V (51.33%) of CKD. Small sized kidneys were present in 65.33% of patients, large size in 29.33% based on ultrasonography. Hyperkalemia was found in 68% patients. Hypocalcemia was noted in 74% patients (Table IV).

Among 150 patients, etiology of CKD was proved histopathologically by renal biopsy in 46 patients (30.67%) which showed etiologies like diabetic nephropathy in 20 patients (13.33%), membranoproliferative glomerulonephritis (MPGN) in 15 patients (10%), IgA nephropathy in 11 patients (7.33%) (Table-V). In the remaining 104 (69.33%) patients, renal biopsy was not done as they had contracted kidneys at presentation and unwillingness of the patients. Among these biopsy unproven patients, based on anemia, hypertension, edema, urinary disturbances, and other clinical and radiological parameters grouped into chronic glomerulonephritis in 70 patients (46.67%), Obstructive uropathy in 20 patients (13.33%), Hypertensive nephropathy in 10 patients (6.67%), and polycystic CKD (PCKD) in 4 patients (2.67%) (Table-V).

Table I: Age distribution of young patients with CKD (n= 150).

Age	Total number of patients	Percentage (%)
15-20	14	9.33%
21-25	25	16.67%
26-30	35	23.33%
31-35	48	32%
36-40	28	18.67%
Total	150	100%

Table II: Sex distribution of young patients with CKD (n= 150).

Sex	Total number of patients	percentage (%)
Male	91	60.67 %
Female	59	39.33 %
Total	150	100%

Table-III: Clinical features of CKD in young patients (n= 150).

Clinical features	Number of patients	Percentage (%)
Pallor		86%
GI symptoms	105	70%
Breathlessness	99	66%
Easy Fatigability	93	62%
Oliguria	84	56%
Facial puffiness	90	60%
Nocturia	30	20%
Edema	120	80%
Features of pulmonary oedema	69	46%

Table-IV: Investigations findings of young patients with CKD (n= 150).

Investigations	Number of patients	Percentage (%)
Anaemia (Hb% < 10gm/dl)	129	86%
Hyperkalemia (K^+ > 5.3 mEq/L)	102	68%
Hypocalcemia (Ca^{++} < 8.5 mg/dl)	111	74%
Hyperphosphatemia (PO_4^- > 4.7 mg/dl)	99	66%
Hyperglycemia (RBS > 11.1 mmol/l)	20	13.33%
Uraemia (Urea > 50 mg/dl)	120	80%
Creatinine >3 mg/dl	150	100%
Proteinuria (urine protein + and more)	135	90%
RBC and RBC cast in urine	70	46.67%
USG KUB (small kidney)	98	65.33%
USG KUB (large kidney)	44	29.33%
CXR P/A View- Pulmonary oedema	69	46%

Table-V: Etiology of CKD in young patients (n=150).

Etiology	Number of patients	Percentage (%)
Diabetic nephropathy	20	13.33%
Hypertensive nephropathy	10	6.67%
Membranoproliferative GN	15	10%
IgA nephropathy	11	7.33%
Obstructive uropathy	20	13.33%
Polycystic kidney disease	4	2.67%
Unknown	70	46.67%
Total	150	100%

Table-VI: Stages of patients with CKD (n =150)

Stages	CrCl rate	Number of patients	Percentage (%)
Stage-I	> 90 mL/min/1.73 m ²	0	0%
Stage-II	60-89 mL/min/1.73 m ²	6	4%
Stage-III A	45-59 mL/min/1.73 m ²	15	10%
Stage-	30-44 mL/min/1.73 m ²	9	6%
Stage-IV	15-29 mL/min/1.73 m ²	43	28.67%
Stage-V	< 15 mL/min/1.73 m ²	77	51.33%
Total		150	100%

Discussion

The present study was done over a period of 5 years, included 150 patients of < 40 years and > 15 years of age with CKD and were assessed clinically and histopathologically to establish the etiology of CKD. Among the 150 patients, the etiology was proven histopathologically in 46 patients (30.67%) which showed etiologies like diabetic nephropathy in 20 patients (13.33%), membranoproliferative glomerulonephritis (MPGN) in 15 patients (10%), IgA nephropathy in 11 patients (7.33%). In the remaining 104 (69.33%) patients, renal biopsy was not done as they had contracted kidneys at presentation and unwillingness of the patients. Among these biopsy unproven patients, based on anemia, hypertension, edema, urinary disturbances, and other clinical and radiological parameters grouped into chronic glomerulonephritis in 70 patients (46.67%), Obstructive uropathy in 20 patients (13.33%), Hypertensive nephropathy in 10 patients (6.67%), polycystic CKD (PCKD) in 4 patients (2.67%), which has shown that chronic glomerulonephritis due to unknown causes was the predominant etiology.

United States Renal Data System 2004 annual data report revealed that the incidence rate of ESRD is higher for males with 409/million population compared to 276 for females¹. Varma and Raman conducted a cross-sectional study that showed predominance in males (66.04%) than females (33.96%)⁴. In this study majority of affected were male (60.67%). Rajapurkar and Dabhi has observed CKD had a higher frequency in males, whereas those with CKD of unknown etiology were younger and had more females⁵.

Rajapurkar and Dabhi observed that in CKD of unknown etiology, the majority were in stage V. In our study we found that majority (51.33%) of the young patients were presented in stage V.

Keller et al⁶ concluded that there was an association between CKD and ureteric calculus regardless of location which was present in this study as obstructive uropathy in 13.33% of our patients. Siddappa et al. conducted a retrospective analysis which showed a prevalence of 7.8% of IgA nephropathy leading to varying degree of renal insufficiency⁷. The present study had 7.33% of patients with IgA nephropathy.

Rajapurkar et al. observed etiology to be diabetic nephropathy 31%, undetermined etiology 16%, chronic glomerulonephritis 14% and hypertensive nephrosclerosis 13% in adults. Neild has observed that congenital anomalies of the kidney and urinary tract account for 20% and predominant glomerulonephritis (histologically not examined) accounted for 28-36%⁸. Present study showed obstructive uropathy 13.33%, diabetic nephropathy in 13.33% and PCKD in 2.67%.

The incidence of glomerulonephritis in the present study is much higher than any other study because of poor socioeconomic living conditions and repeated streptococcal infections probably.

Conclusion

Chronic kidney disease is a worldwide public health problem, both for the number of patients and cost of treatment involved. Globally, CKD is the 12th cause of death and the 17th cause of disability, respectively⁹. Chronic glomerulonephritis constitutes a major etiology among the young though diabetes is

the leading etiology in the general population. Etiologies like diabetes, poststreptococcal glomerulonephritis are preventable, and early intervention can retard the progression to CKD. More data on the spectrum of renal diseases, especially in young patients need to be collected all over the country for better management.

Conflict of interest: None.

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