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Biopsy Proven Kidney Disease From A Rural Tertiary Care Centre — A Social And Epidemiological Perspective

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ABSTRACT

The prevalence of chronic kidney disease (CKD) is rising in rural areas. Screening of high risk cases, early detection and referral by the physicians reduces the prevalence of kidney disease in the population. Hereditary disorders, Glomerular diseases, Obstructive nephropathies are common causes in CKD in rural areas. Kidney biopsy is an essential diagnostic tool in to diagnose glomerular diseases. This prospective study done at tertiary care teaching hospital between 2017 and 2020 to understand the profile of glomerular diseases in rural area. Forty patients were included in the Study. Primary glomerular disease (PGD) was present in 26 patients and Secondary glomerular disease (SGD) in 10 and primary tubulointerstitial pathology in 4 patients. The most common Secondary glomerular disease was lupus. Glomerular diseases are amenable to immunomodulatory therapy leading to change in clinical outcome of the disease. However, Kidney biopsy is underutilized particularly in elderly patients, hypertensive nephropathy patients, suspected non diabetic kidney disease and lupus patients.

Financial and social issues play dominant role in the treatment plan of chronic diseases in rural areas. Regional registry of kidney biopsy of urban and rural areas separately helps in paving a way of understanding the profile of glomerular diseases and its prevention.

KEYWORDS: Kidney diseases, Epidemiologic, Social, Kidney biopsy

INTRODUCTION

The prevalence of chronic kidney disease (CKD) is rising in rural areas [1] which are 80% of the Indian population. Identification of the cause in early stages may change the trajectory of the disease. In urban areas Diabetes Mellitus (DM)and Hypertension (HTN) are the main causes of CKD leading to End Stage Renal Disease (ESRD). [2]Hereditary disorders, Glomerular diseases, Obstructive nephropathies are common causes in CKD in rural areas. The average age of patients on dialysis in rural areas is a decade younger when compared to urban areas [1–3]. The awareness of these disorders by primary health care providers is essential to reduce the prevalence, early detection and timely management of CKD in rural areas.

METHODS

This was a prospective study done at tertiary care teaching hospital in the state of Telangana. The study was done between 2017 and 2020. All patients were from local suburban and rural areas. Demographic data and detailed clinical information were collected before biopsy. Complete blood picture, Urinalysis, Blood urea, Serum creatinine, 24 hour urine protein quantification, Serum albumin,Serum cholesterol and Imaging of kidneys were done. Serum ANA (anti nuclear antibody) profile, serum complement levels, Anti GBM(Glomerular basement Membrane), c – ANCA(Anti neutrophilic cytoplasmic antibody), p-ANCA were done whenever indicated.

Clinical indications for kidney biopsy were- Nephrotic syndrome, nephritic syndrome, CKD, Unexplained kidney failure, rapidly progressive renal failure and persistent Urine abnormalities. Normal coagulation profile and normal blood pressure was ensured and informed consent was taken. All samples were analyzed by light microscopy and immunoflorescence. Electron microscopy was not done due to financial constraints.

RESULT

Forty patients were included in the Study. Male patients were 21 and female were 19 in number. Male to female patient ratio was 1.10and age range was from 10 years to 66 years. Mean age of the patients was 36.41 yearsTable 1

Indications for kidney biopsy was Nephrotic syndrome in14 patients followed by Nephritic syndrome in 8, urine abnormalities in 8, Unexplained AKI in 5, RPRF in 4 and CKD in 1 patient.Table 2

Primary glomerular disease (PGD) was present in 26 patients and Secondary glomerular disease (SGD) in 10 and primary tubulointerstitial pathology in 4 patients. The most common PGD membranous nephropathy (MN) in 8 patients followed by PIGN(post infectious glomerulonephritis) in 5, Focal Segmental Glomerular Sclerosis (FSGS) in 4, Minimal Change Disease (MCD) in 3, and IgA nephropathy (IgA N) in 3, Membrano-proliferative Glomerular-nephritis (MPGN) in 2 and C3 Glomerulopathy in 1 patient.Table 3

The most common Secondary glomerular disease was lupus (n=6), followed by anti GBM disease (n=1), ANCA vasculitis (n=1), malignancy related membranous nephropathy (n=1) and Thrombotic Microangiopathy (n=1). The pathological picture was proliferativenephritis in 5 lupus cases and one had membranous nephropathy. Crescentic glomerulonephritis was seen in anti GBM disease (1) and ANCA vasculitis (1), IgA nephropathy (1) and PIGN (1). Thrombotic Microangiopathy secondary to accelerated HTN was present in one patient.Tubulointerstitial diseases were acute tubular necrosis (2), acute tubulointerstitial nephritis (1), and AA myeloma cast nephropathy (1) Seven patients were lost to follow up. Table 4 Significant number of patients had financial problems (45%) and mental health problems (22.5%) in addition to health issues.Table 5 Death was seen in 15 % of cases which was quite high. The cause of death was directly related to kidney disease in cases of RPRF and in other glomerular disease patients infections and malignancy was the cause of death.

Age range	No.	%
10-20	4	10
21-30	10	25
31-40	11	27.5
41-50	11	27.5
51-60	1	2.5
61-70	3	7.5

Table 1: Age range of patients in the study group

DISCUSSION

In our center diabetic nephropathy was seen in only 20 percent of patients on maintenance hemodialysis. Primary glomerular diseases, tubulo interstitial disease, obstructive nephropathy and hereditary disorders were the main causes of CKD. Most of our dialysis patients are young men and in fourth decade of life. These non-diabetic kidney diseases are to be identified early to reduce the prevalence of kidney disease in young rural patients. Kidney biopsy is the accurate test to identify glomerular diseases, an important cause of CKD. Primary glomerular diseases are amenable to immunomodulatory therapy leading to change in clinical outcome of the disease. Membranous nephropathy (MN) was the most common primary glomerular disease. This was similar to other studies.[4–7]. There is decreasing prevalence of MCD and MPGN worldwidedue to better socioeconomic standards and control of infectious diseases. In our study IgA nephropathy and FSGS was present in three patients each. All these six patients presented with deranged RFT. In countries like Japan and Italy [8, 9]where urinalysis is part of national health programme for screening for kidney diseases glomerular diseases like IgA nephropathy are picked up earlier before patients become symptomatic and develop progressive CKD.C3 Glomerulopathy patient was 10-year-old boy whose serological work up was not done due to financial reasons, and he was lost to follow up.PIGN superimposed on underlying diabetic nephropathy has poor prognosis.[10–13]We had two such patients with different outcome. One patient became dialysis dependent and later succumbed, another patient recovered completely.Crescentic glomerulonephritis (GN) was present in

Clinical indications	No.	%
Nephrotic syndrome	14	35
Nephritic syndrome	8	20
Urine abnormalities	8	20
Unexplained AKI	5	12.5
RPRF	4	10
CKD	1	2.5

AKI- acute kidney Injury, RPRF- Rapidly progressive renal failure, CKD-Chronic Kidney disease

Table 2: Clinical indications for kidney biopsy in the study group

Outcome	No.	%
Complete remission	19	47.5
Partial remission	2	5
Lost to follow up	7	17.5
Treatment going on	6	15
Death	6	15

Table 4: Outcome of patients in the study group

Social issues	Male	Females
Financial issues*	8(20%)	10(25%)
Mental health and social problems	2(5%)	7(17.5%)

* Financial issues relates affecting the investigations and management

Table 5: Social Issues affecting the study group

PRIMARY GLOMERULAR DISEASE	Male	Female	Total No. (%)
Minimal Change Disease	0	3	3(7.5)
FSGS	1	3	4(10)
Membranous Nephropath	5	3	8(20)
IgA Nephropathy	2	1	3(7.5)
MPGN	0	2	2(5)
PIGN	4	1	5(12.5)
C 3 Glomerulopathy	1	0	1(2.5)
SECONDARY GLOMERULAR DISEASE			
Lupus nephritis- proliferative	3	2	5(12.5)
Secondary MN due to lupus	0	1	1(2.5)
Secondary MN due to malignancy	1	0	1(2.5)
TMA due to accelerated HTN	0	1	1(2.5)
Anti GBM disease	0	1	1(2.5)
ANCA vasculitis	0	1	1(2.5)
TUBULOINTERSTITIAL DISEASE			
Acute tubulointerstitial disease	1	0	1(2.5)
Acute tubular necrosis	2	0	2(5)
Myeloma cast nephropathy	1	0	1(2.5)

FSGS- Focal segmental Glomerulosclerosis,MPGN- Membreno proliferative Glomerulonephritis,PIGN- post infectious glomerulonephritis, MN-membranous nephropathy,TMA-Thrombotic microangiopathy,HTN- Hypertension,GBM- Glomerular basement membrane,ANCA- anti neutrophilic cytoplasmic antibody,

Table 3: Glomerular Diseases in the study group

four patients. Three of them became dialysis dependent and all died due to illness in less than one year. Plasmapheresis and rituximab therapy was not used due to financial reasons. One patient had TMA due to accelerated HTN, he responded well to stringent blood pressure control with improvement in renal parameters. Repeated counseling for strict control of blood pressure is an essential part of management of CKD.

The most common secondary glomerular disease was lupus nephritis (n=6), as seen in other studies. [7, 11, 14–16] Lupus nephritis cases were referred for usually biopsy after there was derangement of renal function test. Referring early at the time of positive urine sediment may help in better renal survival. Young women with lupus nephritis patients had low self-esteem. Three of our patients had suicidal tendencies unable to cope with disturbed physical and mental health and social issues due to pregnancy related problems. The percentage of non-diabetic kidney disease in Diabetics is almost 45%. [17, 18] All our diabetic patients were biopsied only when there was strong suspicion of non-diabetic kidney disease based on clinical clues and investigations. There were no exclusive cases of diabetic nephropathy. It definitely is a selection bias. There should be low threshold for renal biopsy as glomerular diseases are usually of immune etiology and are treatable with immunosuppressive therapy. Kidney biopsy is underutilized in elderly patients, hypertensive nephropathy patients, suspected non diabetic kidney disease and lupus patients. [19–21] There was lack of motivation on part of the patients and their families for long term follow up particularly if they are not symptomatic. Few patients abandoned therapy due to side effects and opted for alternative herbal medicines as they claimed that it provided complete cure with no side effects. Poverty, lack of education and loss of work days dominated the decisions made by patient families.

Screening for Kidney diseases should be part of the National health care program and it can be done by mandatory BP checkup, urinalysis and serum creatinine test. These tools are easily accessible, reliable and cost effective. It is vital to have a regional biopsy registry which will throw light on prevalence of treatable glomerular disease in that area. Easily accessible nephrology, urology and nephropathology services may change the scenario of prevalence of chronic kidney disease in rural area.

CONCLUSION

Screening of high risk cases, early detection and referral by the physicians reduces the prevalence of kidney disease in the population. Kidney biopsy is an essential diagnostic tool in this era of evidence based medicine. Financial and social issues may influence the treatment of chronic kidney disease and ultimately its outcome. Regional registry of kidney biopsy helps in laying of policies for preventive nephrology.

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