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Nephrology

THE SPECTRUM OF BIOPSY PROVEN RENAL DISEASE IN A ERTIARY CARE CENTRE IN SOUTH TAMILNADU

R. Arul	M.D (GM)., DM(Nephrology), Head And Associate Professor Of Department Of Nephrology, Govt. Rajaji Hospital, Madurai Medical College.
A. Jegan	MD (GM)., DM(Nephrology), Assistant Professor Of Department Of Nephrology, Govt. Rajaji Hospital, Madurai Medical College.
P. Arun Prasath	MD (GM)., DM(Nephrology), Assistant Professor Of Department Of Nephrology, Govt. Rajaji Hospital, Madurai Medical College.
S. R. Ramprasanth*	MD (GM) Postgraduate, Govt. Rajaji Hospital, Madurai Medical College. *Corresponding Author

ABSTRACT

OBJECTIVE: Renal biopsy is necessary in assessment of renal diseases as it provides histopathological diagnosis in the field of nephrology. Pattern varies with demography. Our study is done in one of the tertiary care centre in south Tamilnadu.

MATERIALS AND METHODS: patient who underwent renal biopsy during the period may 2017 to December 2017 were retrospectively reviewed. All biopsy specimens were examined by the same pathologist with light and immunofluorescence microscopy. Electron microscopic analysis was performed only in selected cases.

RESULT: Out of 62 patients, 24 were male and 38 were female. Primary glomerular diseases are most common diagnosis. The overall most common indication was NS (60%), followed by AUA (10%). The most common pathology was MCD (21%) and least was MesPGN (1.6%).

CONCLUSION: Our study gives an insight into the epidemiology of renal disease in South India. Our study corresponds to the distribution pattern described in other South Indian studies.

KEYWORDS :

INTRODUCTION:

There are various presentation of glomerular diseases and renal biopsy is an important tool in its assessment because histopathological diagnosis is an essential part of evidence-based practice of nephrology. It can guide in deciding therapeutic options and can be of prognostic value. Pattern of biopsy proven renal disease(BPRD) varies with time and geographical region[1]. A review of the renal biopsy data can give idea about the spectrum of renal diseases and its epidemiology data in our community. We conducted the present study to report the spectrum of BPRD from a tertiary care Centre in southern Tamilnadu and comparing it with previous other studies to see the changing trend.

AIM:

To study the spectrum of BPRD in our centre and analyzing its trend with previous study. There is limited study from Indian centre and there is great variation when compared across globe.

MATERIALES AND METHODS:

The records of all the patient who underwent renal biopsy in Govt. Rajaji hospital, Madurai during the period may 2017 to December 2017 were retrospectively reviewed. The patients detail and laboratory investigation reports were obtained. Inadequate biopsy and renal allograft biopsy were excluded. All the biopsies were performed under ultrasound guidance using Bard® Max-Core® disposable core biopsy instrument. All the biopsies were analyzed by light microscopy using hematoxylin and eosin, periodic acid–Schiff, Jone's silver methenamine, and Gomori's trichrome stains, and immunofluorescence studies were performed using antihuman IgG, IgA, IgM, C3, C1q, and kappa and lambda light chains. The diagnosis of BPRD was made as per standard diagnostic criteria for each disease. The indications for renal biopsy were categorized as: Nephrotic syndrome(NS) defined as proteinuria > 3.5 gram/24hours and serum albumin < 2.5 gram/dl[2]. Acute kidney injury(AKI) defined as rapid and usually reversible decline in GFR and RIRFLE criteria is used to define it[3]. Rapidly progressing renal failure(RPRF) defined as deterioration in GFR with azotemia, over a period of few days, with radiologically normal sized kidneys[4]. Asymptomatic urinary abnormality(AUA) defined as non-nephrotic range proteinuria <3.5 gram/24 hour and hematuria defined as ≥3 red cells per high power field[2,5]. Chronic kidney disease defined as per NKF KDOQI Guidelines, as either kidney damage (structural or functional abnormalities) or GFR <60 mL/min/1.73 m2 for ≥3 months[6].

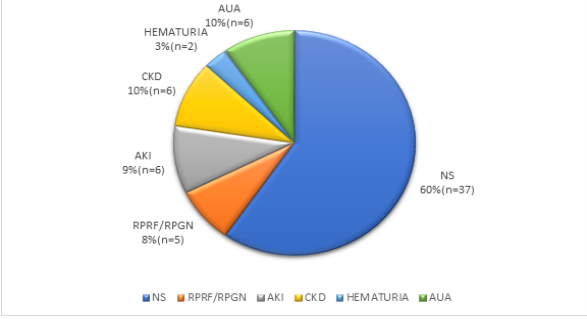
Histological categories include minimal change disease(MCD), membranous nephropathy(MN), membrano proliferative glomerulonephritis (MPGN), post infective glomerulonephritis (PIGN), mesangio proliferative glomerulonephritis (MesPGN) Crescenticlomerulone phritis (CresGN), focal and segmental glomerulonephritis (FSGS), chronic glomerulo nephritis(CGN), IgA nephro pathy (IgAN), diabetic nephropathy(DN), lupus nephritis(LN), thrombotic microangiopathy(TMA), end stage renal disease(ESRD).

Simple descriptive statistics such as median and mean±SD was used for variables such as age, clinical and laboratory features. The percentages were used for categorical data.

RESULTS:

Out of 62 patients, 24 were male and 38 were female. 9 out of 38 females and 1 out of 24 male had secondary glomerular disease. Among them, 3 patients had thrombotic microangiopathy, 6 had lupus nephritis and 1 had diabetic nephropathy. Among the 62 patients, 37 had presented with NS, 6 with AUA, 6 with AKI, 6 with CKD, 5 with RPRF and 2 with hematuria.

TABLE 1: INDICATIONS FOR RENAL BIOPSY



The overall most common indication for renal biopsy was NS (60%), followed by AUA (10%), CKD (10%), AKI (9%), RPRF (8%)and hematuria (3%).

The most common histopathological diagnosis was MCD (21%) and least was MesPGN (1.6%) and diabetic nephropathy (1.6%).

Table 2: Gender Distribution Of Glomerular Diseases

Biopsy Diagnosis	Gender		Total (n=62)
	Male (n=24)	Female (n=38)	
ESRD	-	2 (5.3%)	2 (3.2%)
CresGN	3 (12.5%)	4 (10.5%)	7 (11.3%)
DN	-	1 (2.6%)	1 (1.6%)
FSGS	4 (16.7%)	3 (7.9%)	7 (11.3%)
CGN	-	2 (5.3%)	2 (3.2%)
IgAN	-	2 (5.3%)	2 (3.2%)
LN	-	6 (15.8%)	6 (9.7%)
MCD	6 (25.0%)	7 (18.4%)	13 (21.0%)
MesPGN	1 (4.2%)	-	1 (1.6%)
MN	5 (20.8%)	4 (10.5%)	9 (14.5%)
MPGN	1 (4.2%)	1 (2.6%)	2 (3.2%)
PIGN	3 (12.5%)	4 (10.5%)	7 (11.3%)
TMA	1 (4.2%)	2 (5.3%)	3 (4.8%)

Sex distribution of various BPRD:

Male predominance is seen in FSGS (16.7%), MCD (25%), MN (20.8%), CresGN and PIGN (12.5%) and MesPGN (4.2%). Female predominance is seen in the rest of the histopathological diagnosis.

Table 3: Distribution Of Glomerular Diseases According To Age:

Biopsy Diagnosis	Age Group (in yrs)			Total (n=62)
	<20 (n=16)	20 – 40 (n=31)	>40 (n=15)	
ESRD	1 (6.3%)	1 (3.2%)	-	2 (3.2%)
CresGN	1 (6.3%)	5 (16.1%)	1 (6.7%)	7 (11.3%)
DN	-	-	1 (6.7%)	1 (1.6%)
FSGS	1 (6.3%)	6 (19.4%)	-	7 (11.3%)
CGN	-	1 (3.2%)	1 (6.7%)	2 (3.2%)
IgAN	-	2 (6.5%)	-	2 (3.2%)
LN	-	4 (12.9%)	2 (13.3%)	6 (9.7%)
MCD	9 (56.3%)	3 (9.7%)	1 (6.7%)	13 (21.0%)
MesPGN	-	1 (3.2%)	-	1 (1.6%)
MN	2 (12.5%)	3 (9.7%)	4 (26.7%)	9 (14.5%)
MPGN	1 (6.3%)	1 (3.2%)	-	2 (3.2%)
PIGN	-	3 (9.7%)	4 (26.7%)	7 (11.3%)
TMA	1 (6.3%)	1 (3.2%)	1 (6.7%)	3 (4.8%)

Age distribution of various BPRD:

MCD (21%) is the most common diagnosis among all age groups, followed next by MN (14.5%). Among adults age <20 years, MCD is most common followed by MN. In age group >40 years, MN and PIGN occur at same frequency. Among 20-40 years age group, FSGS was most common.

Table 4: Comparison Between Creatinine Level And Bprd

Biopsy Diagnosis	Creatinine Level (mg/dL)			Total (n=62)
	<1.5 (n=30)	1.5 – 3.0 (n=17)	>3.0 (n=15)	
ESRD	-	-	2 (13.3%)	2 (3.2%)
CresGN	-	1 (5.9%)	6 (40.0%)	7 (11.3%)
DN	1 (3.3%)	-	-	1 (1.6%)
FSGS	5 (16.7%)	1 (5.9%)	1 (6.7%)	7 (11.3%)
CGN	-	1 (5.9%)	1 (6.7%)	2 (3.2%)
IgAN	-	2 (11.8%)	-	2 (3.2%)
LN	4 (13.3%)	2 (11.8%)	-	6 (9.7%)
MCD	11 (36.7%)	2 (11.8%)	-	13 (21.0%)
MesPGN	-	1 (5.9%)	-	1 (1.6%)
MN	6 (20.0%)	3 (17.6%)	-	9 (14.5%)
MPGN	1 (3.3%)	1 (5.9%)	-	2 (3.2%)
PIGN	2 (6.7%)	3 (17.6%)	2 (13.3%)	7 (11.3%)
TMA	-	-	3 (20.0%)	3 (4.8%)

Association with serum creatinine at time of presentation: MCD commonly presented with serum creatinine value of <1.5 mg/dl, followed by MN. Presentation with value >3mg/dl was with CresGN and TMA.

Table 5: Pattern Of Biopsy Proven Renal Diseases

Biopsy Diagnosis	Clinical Diagnosis						
	NS (n=37)	RPGN (n=5)	AKI (n=6)	CKD (n=6)	MH (n=2)	AUA (n=6)	Total (n=62)
ESRD	-	-	-	2 (33.3%)	-	-	2 (3.2%)
CresGN	1 (2.7%)	2 (40.0%)	1 (16.7%)	1 (16.7%)	2 (100.0 %)	-	7 (11.3%)
DN	1 (2.7%)	-	-	-	-	-	1 (1.6%)
FSGS	6 (16.2%)	-	-	-	-	1 (16.7%)	7 (11.3%)
CGN	-	-	-	2 (33.3%)	-	-	2 (3.2%)
IgAN	1 (2.7%)	1 (20.0%)	-	-	-	-	2 (3.2%)
LN	2 (5.4%)	1 (20.0%)	-	-	-	3 (50.0%)	6 (9.7%)
MCD	11 (29.7%)	-	1 (16.7%)	1 (16.7%)	-	-	13 (21.0%)
MesPGN	-	1 (20.0%)	-	-	-	-	1 (1.6%)
MN	8 (21.6%)	-	-	-	-	1 (16.7%)	9 (14.5%)
MPGN	1 (2.7%)	-	-	-	-	1 (16.7%)	2 (3.2%)
PIGN	6 (16.2%)	-	1 (16.7%)	-	-	-	7 (11.3%)
TMA	-	-	3 (50.0%)	-	-	-	3 (4.8%)

DISCUSSION:

In our study 62 patients with BPRD were retrospectively analyzed in our Centre. Primary glomerular diseases constituted to about 83.9% and secondary glomerular diseases were about 16.1%.

Primary glomerular disease is the most common cause of BPRD corelating with majority of studies done worldwide[7]. The most common indication for renal biopsy was NS accounting for 60%, which is similar to most of the studies done worldwide and also in india[8,5,11,15,13,12]. Male predominance is seen in our study, similar to other studies done worldwide[9,8,5,15,13,9]. In our study MCD is the most common cause of Primary glomerular disease and is also the most common cause of NS, which is in concordance with other studies from world and also from south india[10,2,5].

MN, being quoted as most common cause of NS in adults in most of renal pathology textbooks[11,5], is found to be second cause for Primary glomerular disease in our study (14.5%), its incidence peak during third and fourth decade (26.7%).

There is a worldwide increase in incidence of FSGS in recent times[12,3,12,13,14]. But it is the third cause of Primary glomerular disease in our study with incidence peaking at third decade (19.4%).

Even though IgA nephropathy is considered most common cause of glomerular disease worldwide, it is the least cause of Primary glomerular disease in our study (3.2%) which is similar to other Indian studies[13,8,15,13,14]. Among the secondary glomerular diseases, LN is the most common cause (9.7%) which is followed by TMA and DN. This is similar to western studies[14,2,5,8,10,12]. Since most of DN cases are diagnosed by ophthalmic evaluation and without renal biopsy, it has a lesser representation in the study.

Comparing our study with Narasimhan et al done at 2006[15], the most common indication for biopsy was nephrotic syndrome and most of the lesions were of primary glomerular diseases, which was similar to our study. But the most common diagnosis was mesangioproliferative glomerulonephritis followed by FSGS, with does not coincide with our study.

Comparing our study with Das et al done at 2011[16], which analyzed distribution of biopsy proven disease in a tertiary care centre in south India. In this study the most common indication for biopsy was nephrotic syndrome followed by chronic kidney disease. Primary glomerular diseases were more common and most common lesion was minimal change disease, which is similar to our study. The most common cause of secondary glomerular disease was lupus nephritis which is also similar to our study.

Kazi et al done in 2009 studied 316 BPRD[17], in which the most common lesions were FSGS then membraneous glomerulonephritis. This does not corelate with our study. It might be due to geographical variation of its occurrences.

RPRF was found in 5 patients (8%) among them the leading cause was CresGN (3.2%) and MPGN (3.2%) followed by IgAN (1.6%). The most common histological lesion in RPRF is cresentic GN. Most common cause being vasculitis and is caused by post infective immune complex deposition.

Totally 6 patients had AKI (9%) in our study and the cause being, 3(4.8%) patients were diagnosed to have TMA, 3(3.76%) had PIGN. A study done in south india[18] has shown that acute interstitial nephritis was the most common finding in 40.8% patients followed by post infectious glomerular nephritis (19.2%) and ischemia causes (6.9%). This does not corelate with our study as TMA is the leading cause followed by PIGN in our study.

CONCLUSION:

Our epidemiological data represents that of a major tertiary care centre in south India. And our observations are in concurrence with that of other studies done in south India. Large demographic variation of histopathological patterns of BPRD are seen across the world and within various parts of India. So, in order to have an accurate data, it is imperative to maintain a local renal biopsy registry.

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