Original Article

Spectrum of kidney disease, a ten years' experience of renal biopsies at single center tertiary care hospital

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Objective: To determine the frequency with type of renal diseases by renal biopsy at our center.
Methodology: This petrospective study of renal biopsies was performed at Department of Nephrology JPMC, Karachi from January 2009 to May 2019. We categorized the patients according to age, gender. We have light microscopy and immunofluorescence examination only.
Results: A total of 502 renal biopsies were performed. There were 207 male and 199 female patients. In the glomerular lesions, most common was FSGS of 30.5% and Membranous GN of 15.3 % followed by MPGN of 9.4%, Lupus Nephritis 15.3%, vasculitis 2.2%, Chronic Sclerosing GN 2%, ATN 8.6%, AIN 0.2% and others of 14.5%.
Conclusion: Our 10 years biopsy data analysis showed Nephritic Syndrome as the most common clinical indication for biopsy and FSGS is the leading lesion with 30.5% cases. (Rawal Med J 202;46:278-281).
Keywords: Renal biopsy, glomerular lesions, lupus nephritis.

INTRODUCTION

Almost 37 million Americans suffer from chronic kidney diseases, which accounts for 15% of the population.[1] The number of patients with chronic renal failure in Pakistan is continuously increasing with an estimated annual incidence of >100 new cases of end-stage renal disease (ESRD) per million populations.[2] Spectrum of renal pathology ranges from asymptomatic to life threatening conditions.[3] Renal biopsy is the gold standard for the diagnosis.[4,5] Kidney biopsy is a safe procedure, it helps in the correct diagnosis and to use the treatment based on histopathology diagnosis and to predict the clinical course and outcome.[6,7] Nowadays, most of the clinical centers employ the use of percutaneous renal biopsy using the real time ultrasonography as well as automated biopsy devices.[8,9]

It also has a critical role in diagnosing different types of tubulointerstitial and vascular diseases.[10] Therefore, an adequate histological specimen is mandatory for an accurate detection of the specific ailment affecting the renal tissue.[10,11] The Pattern of biopsy proven renal disease varies based on the geographic area and with time.[6,7,12,13,14]

In Pakistan, studies in different regions showed variable results.[2,15,16,17] So this study was performed to see the cause of renal disease at our center.

METHODOLOGY

This is a retrospective study of the entire kidney biopsies performed at the Department of Nephrology, JPMC, Karachi, from January 2009 to May 2019. This study was approved by the ethical committee (letter No F.2-18/2019-GEN/35608/JPMC, dated on 21/10/2019). Prior to carrying out the procedure, informed and written consent was taken.

The indications of renal biopsy included Nephrotic Syndrome, Nephritic Syndrome, AKI, Rapidly Proliferative Glomerulonephritis, Persistent Proteinuria and Isolated Hematuria. Biopsies were taken using Bard® Monopty® disposable core biopsy instrument of 16 and 18 gauge followed by tissue sectioning and paraffin embedding. Analyzed by light microscopy using hematoxylin and eosin, Periodic acid Schiff, Jones silver methenamine, Congo red and Gamore trichome stains was done. Immunofluorescence studies were performed using antihuman IgG, IgA, IgM, C3, C1q and kappa and Lambda light chains.

Statistical Analysis: All data analysis was performed using SPSS Statistics 25.

RESULTS

This study involved biopsies taken from 502 patients (Table 1). In relation to the pre-operative indications of renal biopsy, clinical indication was Nephrotic syndrome (54.2%), Nephritic Syndrome (16.7%), Acute Kidney injury (15.8%), RPGN (5.8%), Persistent Proteinuria (3.6%) and isolated hematuria (0.2%) (Table 2).

Table 1. Gender frequency.

Gender	Frequency	Percent
Male	251	50
Female	251	50
Total	502	100

Table 2. Indications of renal biopsy.

Indication	Frequency	Percentage
Nephrotic Syndrome	272	54.2
Nephritic Syndrome	84	16.7
AKI	79	15.7
RPGN	29	5.8
Acute GN	19	3.8
Persistent Proteinuria	18	3.6
Isolated Hematuria	1	0.2
Total	502	100.0

Table 3. Frequency of biopsy proven renal disease.

Lesion	Frequency	Percent
FSGS	153	30.5
Membranous	83	16.5
Lupus Nephritis	75	14.9
MPGN	49	9.8
ATN	25	5.0
CAN	23	4.6
TIN	23	4.6
MCD	16	3.2
Amyloidosis	13	2.6
Vasculitis	10	2.0
Chronic Sclerosing GN	7	1.4
Post Infectious GN	6	1.2
Contrast induced	5	1.0
IgA Nephropathy	3	0.6
HUS/TTP	2	0.4
Benign Nephrosclerosis	2	0.4
Myeloma cast nephropathy	2	0.4
Diabetic Nephropathy	2	0.4
Pigment nephropathy	1	0.2
HTN nephropathy	1	0.2
Chronic Interstiatial	1	0.2
Total	502	100.0

Table 4. Lesion variation in different studies.

Lesion	We	Imtiaz et al	Mubarak et al	Bakhit et al	Gopaliahal et al	Al-Riyami et al	Al-Imam et al
	Pakistan	Pakistan	Pakistan	Saudi Arab	India	Oman	Iraq
FSGS	30.0%	64.8	21.2%	27.3	13.7	19.5	22.44
MNG	16.5%	19.5	17.2%	22.7	7.78	9.8	11.53
LUPUS N	14.9%	4.7	4.9%	6.3	5.18	36.1	5.15
IgA-N	0.6%	2.6	1.5%	36.4	22.33	3.0	4.37
ATN	5.0%	2.4	6.9%	12.5	3.7	2.3	3.02
Myeloma	0.4%	0.2%		0.8	1.64	2.3	0.9
DM	0.2%	5.7	0.9%	37.5	5.92	37.5	1.23

Focal Segmental Glomerulosclerosis, Membranous Glomerulonephritis, Lupus Nephritis, Vasculitis, Chronic Sclerosing Glomerulonephritis, Diabetic Nephropathy, Membranoproliferative Glomerulonephritis, Rapidly Progressive Glomerulonephritis, Acute Tubular Necrosis, Acute Interstitial Nephritis, Minimal Change Disease and Thrombotic Microangiopathy were common diagnosis (Table 3).

The frequency of the major glomerular diseases was FSGS (30.5%), Membranous GN (16.5%), Lupus nephritis (14.9%), Membranoproliferative Glomerulonephritis (9.8%%), ATN (5%), ACN (4.6%,), TIN (4.6%), Minimal Change Disease

(3.2%), Amyloidosis (2.6%), Vasculitis (2.0%), Chronic sclerosing GN (1.4%), Post-infectious GN (1.2%), IgA Nephropathy (0.6%), HUS/TTP (0.4%), Myeloma Cast nephropathy (0.4%), Diabetic Nephropathy (0.4%), HTN nephropathy (0.2%) (Table 4).

DISCUSSION

Over the past 10 years 502 biopsies were performed at our center. There were a lot of limitations in for performing renal biopsies and our study like changing diagnostic criteria, absence of serological data, multiple pathologists and standardization issues. Analysis of the biopsies found almost equal distribution of gender.

While other studies performed in Pakistan by Naila et al, Mubarak et al and Imtiaz S et al all have higher number of male patients.[15-17] Gopaliah et al[18] found IgA is the most common glomerular lesion (23.33%), Acute Tubular Necrosis was detected as the most common non-glomerular lesion (5.0%). more common in female patients. Bandi et al, Bakhit et al and recent data from Canada, Alberta region by Cunningham et al have predominance of male participants (58% male).[19-22]

Data from Oman by Al Riyami et al, showed more females (63.9%).[22] Our results are consistent with most of the other studies from Pakistan, majority was nephrotic as by, Mubarak et al (49.9%) and Imtiaz et al(45.7%).[16,17]

In Iraq, Al-Imam et al also showed Nephrotic syndrome (46.47%).[3] Membranous nephropathy was found as most common glomerular lesion in a study done in older patients, while Manjunath et al found minimal change disease (33.7%) most common in older population of south India.[23] Lupus nephritis was the third leading cause for glomerular lesion.

We found 75 (14.9%) cases and mostly in female gender. These results are somehow different from other local studies published by Mubarak et al (4.9%) and Imtiaz et al which have lupus nephritis of 4.7%.[16,17]

CONCLUSION

Our 10 years biopsy data analysis showed nephritic syndrome as the most common clinical indication for biopsy, FSGS is the leading lesion with 30.5%

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Conflict of Interest: None declared
Rec. Date: May 22, 2020 Revision Rec. Date: Nov 9, 2020 Accept Date: April 4, 2021

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