

FREQUENCY OF HISTOPATHOLOGICAL PATTERNS OF RENAL DISEASES IN A TERTIARY CARE HOSPITAL

Muhammad Ikram¹, Shad Muhammad², Akhtar Ali³, Noor Muhammad⁴, Khan Bahadur⁵, Mian Iftikhar Ul Haq⁶

¹⁻⁶ Department of Nephrology, Lady Reading Hospital, Peshawar-Pakistan

Address for Correspondence:

Dr. Muhammad Ikram

Assistant Professor,
Department of Nephrology,
Lady Reading Hospital, Peshawar-Pakistan

Email: mikramakhunzada@gmail.com

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ABSTRACT

Objective: To find out the histological patterns of renal diseases in patients, who underwent renal biopsy at Lady Reading Hospital Peshawar, Pakistan.

Methodology: This was a descriptive study conducted at Lady Reading Hospital Peshawar, Pakistan from July 2012 to July 2015. We performed renal biopsy of all patients who presented with; nephrotic syndrome, non-nephrotic range significant proteinuria, rapidly progressive glomerulonephritis, acute unexplained renal failure, sub-acute renal failure of unknown cause and nephritic syndrome.

Results: Total number of patients were 200. Mean age was 42.5 ±8.2 yrs. In 56(28%) of the patients the histological diagnosis was focal segmental glomerulosclerosis (FSGS), followed by membranous nephropathy (MN) 28(14%) minimal change disease (MCD) 25(12.5%), membrano-proliferative glomerulonephritis (MPGN) 20(10%) and lupus nephritis in 14(7%).

Conclusion: Focal segmental glomerulosclerosis was leading cause of primary glomerular diseases. While secondary glomerular disease (SGN) in our population was most commonly caused by lupus nephritis (LN).

Key Words: Renal biopsy, Focal segmental glomerulosclerosis, Histopathological pattern

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INTRODUCTION

Glomerulonephritis (GN) represents several kidney diseases characterized by the inflammation of the functional part of the kidney called the glomeruli or endothelium of the small blood vessels in the kidneys. Inflammation particularly is not an essential component in all these groups. GN in strict words is not a single disease and hence the reason that its presentation always differs and mostly depends on the specific disease entity. Blood in urine, proteinuria less than 3 gm/day, proteinuria of nephrotic range, nephritic syndrome and acute kidney injury are the common presentations of GN but it may present with chronic kidney disease in some situations¹⁻³.

As we look into GN more closely, it is categorized simply into several histopathological patterns and classified broadly into non-proliferative and proliferative types. Where non-proliferative pattern is characterized by the form of GN in which the number of cells per glomerulus are not increased or the total number of cells remain the same. This is the form which usually result in the nephrotic syndrome and most commonly caused by MCD, FSGS, MN and thin Membrane disease. on the other hand, the number of native cells are in-

creased per glomerulus in proliferative GN. This form usually presents with a triad of blood in the urine, decrease in urine output and raised blood pressure, mostly called as the nephritic syndrome. IgA nephropathy, post-infectious GN, membrano-proliferative and rapidly progressive GN (RPGN) are worth mentioning causes of proliferative GN^{4,5}.

Correct diagnosis of particular type of GN is often challenging and may need a spectrum of investigations; as urine examination, blood tests including full blood count, inflammatory markers and special tests including ASO titers, ANCA, antinuclear antibodies, Anti GBM, complements levels along with good history, clinical examination and intervention like kidney biopsy as well^{6,7}. Kidney biopsy give epidemiological information, determine local trends, changes in disease pattern and has increased the positive predictive value to 95-100% for differential diagnosis⁸.

The aims of our study were to find out the histological patterns of renal diseases in patients, who underwent renal biopsy at Lady Reading Hospital Peshawar and to find out the changing trends in the histological diagnosis of renal diseases. This will practically implicate the early management, less chance of having wrong di-

agnosis, a more predicted future prognosis and saving finances.

METHODOLOGY

This was a descriptive study with consecutive sampling carried out at Department of Nephrology, Lady Reading Hospital, Peshawar, from July 2012 to July 2015. During this study a total of 200 renal biopsies were performed.

After taking an informed consent from the patients and approval from ethical committee of the hospital, the following patients with; nephrotic syndrome, nephritic syndrome, acute renal failure of unknown cause and significant non-nephrotic range proteinuria (proteinuria >1gm/24hrs) with or without renal failure were included. While patients having uncontrolled hypertension, solitary kidney, peri-nephric collection or abnormal coagulation profile were excluded from this study.

In our study, we performed renal biopsies under ultrasound guidance in a prone position, with the patient lied over his/her abdomen and a support put in under his/her abdomen to let the kidney pushed towards the posterior abdominal wall. Then both kidneys were visualized, to made sure the presence of two kidneys. Skin was wiped clean with povidone iodine and lower pole of the left kidney was marked, local anesthetic injected into the skin and renal capsule, renal biopsy needle then made ready for insertion under ultrasound guidance. When it was made sure the needle is fully engaged to renal tissue, biopsy gun was fired, renal tissue taken and sent to laboratory in two different preservatives. One for immunofluorescence in liquid nitrogen and the other for light microscopy in formalin. All biopsy samples were sent and reported from one center.

Data was acquired through clinical history, physical examination and relevant investigations. All information was recorded on a pre-designed structured proforma. Descriptive statistical analysis (frequency, percentage,

ratio, range and mean/SD) was employed for variables of interest. Data storage, processing and analysis was done utilizing SPSS version 21.0. Data was presented in the form of graphs and tables.

RESULTS

A total of 200 renal biopsies were carried out during this study. Out of these, 114 (57%) biopsies were from males while 86(43%) were from females.

The mean age was 42.5 ±8.2 yrs, with a range of 13-72 yrs. The commonest indication of renal biopsy was nephrotic syndrome 94(47%). other indications are shown in Figure 1.

In 56(28%) of patients the primary renal diseases were caused by FSGS on histopathological probing, while MN 28(14%) was the second most common cause as shown in Table 1.

DISCUSSION

Primary glomerular disorder was present in half of all native renal biopsies. However, there is marked geographical variation in the proportions of different glomerulopathies. FSGS in the USA⁹, Brazil and India¹⁰ is having an increasing trend in particular, making this the leading cause of primary glomerulopathy(PGN). The incidence of FSGS in African Americans and Caucasian is also high, as well as in, African American and Hispanic populations¹¹. Swaminathan and colleagues¹² also reported the increase in proportion of FSGS from 2.9% to 20% in the Caucasian population in Minnesota and it is consistent with findings of our study.

FSGS was the most common GN in Western Saudi Arabia and Uruguay according to the Fiorentino et al¹³ and also increased in proportion as compared to previous studies in Romania, though the most common glomerulopathy noted was MPGN¹⁴. These changes seem to be following a trend that has also been observed in Western countries a few decades ago and which may

Figure 1: Presentation of renal diseases

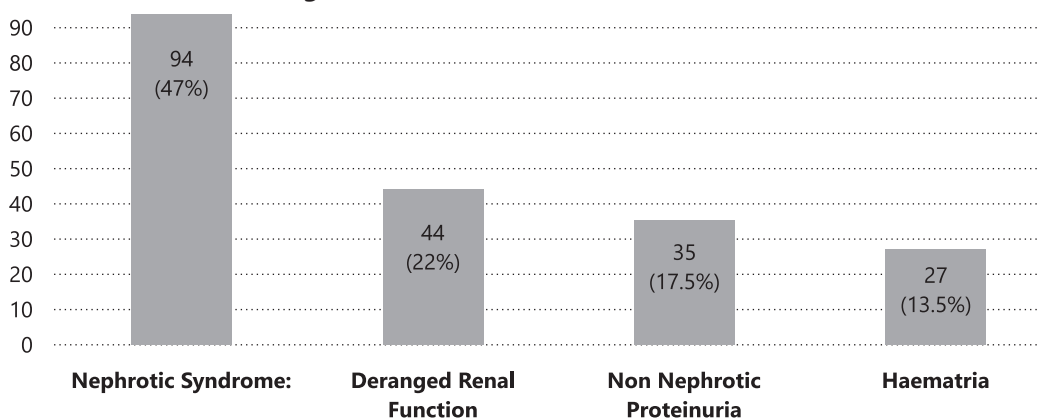


Table 1: Histological diagnosis of renal diseases (n=200)

S.No.	Histological Diagnoses	Number	%
1	FSGS	56	28%
2	Membranous Nephropathy	28	14%
3	MCD	25	12.5%
4	MPGN	20	10%
5	Lupus Nephritis	14	7%
6	Crescentic GN	12	6%
7	Renal Amyloidosis	11	5.5%
8	TIN	11	5.5%
9	IgM Nephropathy	8	4%
10	IgA Nephropathy	4	2%
11	Myeloma Cast	4	2%
12	Hereditary Nephritis	2	1%
13	ATN	2	1%
14	Endocapillary Proliferative	1	0.5%
15	HUS	1	0.5%
16	Diabetic Nephropathy	1	0.5%
	Total	200	100%

have an association with socioeconomic status.

Similarly, our findings are supported by an audit of renal biopsies at JPMC, Karachi and in other centers in Pakistan and India¹⁵⁻¹⁸. FSGS is also reported to be the leading cause of primary renal diseases in Kuwait, as reported by Al-Amiri renal center¹⁹.

In contrast, in Australia, France, Finland, Italy and Czech Republic; IgA nephropathy is the most common primary glomerular disease according to Fiorentino et al¹³. While in India, IgA nephropathy was less common (<10%) a cause of the primary GN lesions. In Thailand, the IgM nephropathy was more common and incidence of IgA nephropathy was <18%. In Korea, IgA nephropathy was recorded in 22%, second in frequency to MCD, while in China a higher incidence of IgA nephropathy (45%) was reported and is still increasing^{12,20,21}. MCD (33.6%) was the commonest PGN followed by MN (15.7%) and FSGS (12.6%) in children in India²³.

A series in Pakistan²² showed that the most frequently occurring glomerulopathy in our region is MPGN, which accounts for 22.22% closely followed by MN 20.37% and FSGS 16.66% cases. This is very similar to the pattern of glomerulopathy reported from PIMS Islamabad²³ and Muzaffar et al²⁴ that also has reported MPGN as the leading cause of glomerulopathy followed by MCD and FSGS. MCD was the commonest histological pattern (40%), followed by MN (21%), crescentic nephritis (19.6%) and FSGS (6.5%) in a study done by Sultan et al²⁵ at Hayatabad Medical Complex Peshawar.

Some of these locally reported studies in local population in Pakistan have showed much different histological patterns as compared to our study. The reasons for such diversity must be reached, to be able to increase the predictability and so the treatment of different diagnosis easily achievable.

Consistent with our findings. The most common form of SGN was LN in most studies from India and Pakistan^{16,18,21}. While one center in India showed diabetic nephropathy (76.9%) as the commonest SGN (14.7%) followed by LN¹⁷. It may be possible that the center had not excluded clinical diabetics nephropathy from the start of the study and so was a flaw in that study design.

LIMITATIONS

This was a single centered study, with not a large sample size and tissues were not examined under electron microscope, due to non-availability. The effect of risk factors upon the frequency of renal diseases is obvious. This type of studies should be conducted from time to time that the changing trends of renal diseases are caught will in time. So that treatment protocols are changed accordingly.

CONCLUSION

Focal segmental glomerulosclerosis was the leading histopathological cause of primary renal disease. While Lupus Nephritis was the most common cause of SGN in our population.

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CONTRIBUTORS

MI conceived the idea, planned the study, and drafted the manuscript. SM, NM, KB and MIUH helped acquisition of data and did statistical analysis. AA supervised the study and critically revised the manuscript. All authors contributed significantly to the submitted manuscript.