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Histopathological Pattern in Adult Nephrotic Syndrome: A Single Center Study from Karachi

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Abstract

Nephrotic syndrome is one of the most common indications of renal biopsy. It is essential to have tissue diagnosis in these patients for instituting the correct treatment. Several studies are available from other centers in Pakistan. Our study is useful addition to this pool of information. It will help the researchers and clinicians equally in better understand the disease pattern of kidney diseases in Pakistan. The objective of this study is to determine the histopathological pattern of the kidney diseases in patients who presented to Aga Khan University Hospital Karachi Pakistan with the diagnosis of Nephrotic syndrome. Kidney biopsy data of ten years from 2003 to 2012 was reviewed to select the cases with the diagnosis of Nephrotic syndrome. Systemic diseases known to cause nephrotic syndrome as well as transplanted kidneys were excluded. Whole group was divided into two subgroups for analysis. Total of 128 patients were identified, 85 male and 43 female. Age range: 16 to 77 years with mean of 37. Over all the most common diagnosis was Membranous Nephropathy. On subgroup analysis, in the younger age group (16 to 40 years)) the most common diagnosis was Minimal change disease. In older age group (41 to 77 years) the most common pathology was Membranous Nephropathy.

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As a conclusion we can say that the three diseases namely Membranous Nephropathy , and Minimal change disease and Focal Segmental Glomerulosclerosis stood out as the most common identities in nephrotic adult patients It is very interesting that our results are remarkably similar to those from other centers of Pakistan.

***Keywords*:** Kidney; Nephrotic; Adult.

1. Introduction:

Nephrotic Range Proteinuria is defined as 24 hour urinary protein excretion more than 3.5 gram per 1.73 m^2 of body surface area. When it is associated with hypoalbuminemia, edema, and hypercholesterolemia, it is called nephrotic syndrome [1]. One of the most common indications of kidney biopsy is nephrotic syndrome. Classically term nephrosis is used when urinary sediments are bland. Active urinary sediments indicate underlying nephritis. Both nephrosis and nephritis may be associated with nephrotic range proteinuria. Management and specific treatment depends upon the histopathological findings as well as the clinical presentation [2].

We reviewed here renal biopsy data of the adult patients who presented to our institution with nephrotic syndrome. Purpose of the study is to determine the spectrum of glomerular diseases associated with nephrotic syndrome in adult patients.

2. Methods

This is a cross section study and includes the kidney biopsies of adult nephrotic patients who presented to Aga Khan University Hospital Karachi Pakistan over the period of ten years from 2003 to 2012. All biopsies were done by a qualified nephrologist or an invasive radiologist, under ultrasound or CT scan guidance. Disposable biopsy needle gun was used. Biopsies sent from outside the institution for reading and reporting only were not included in the study. Systemic diseases known to cause nephrotic syndrome such as diabetes mellitus, lupus, amyloidosis, as well as transplanted kidneys were excluded.

Biopsies were read by a well trained and experienced renal histopathologist. Light microscopy included staining with Hematoxylin and Eosin (H & E), periodic acid Schiff (PAS), Massines trichrome and Jones silver methanamine. Immunofluorescence staining was also done in all the cases. Electron microscope was not available.

3. Results

Total of 128 kidney biopsies were included in the study. Age range was 16 to 77 years with mean age of 37 years. There were 85 male and 43 female patients. Whole group was divided into two groups for sub analysis. One group from 16 to 40 years of age and the other group from 41 to 77 years. Analysis of the whole group is presented in Table 1. Membranous Nephropathy was the most frequent histopathological finding, followed by Minimal Change Disease (MCD) and Focal segmental Glomerulosclerosis (FSGS). On subgroup analysis, in younger age group (Table 2) the most common diagnosis was minimal change disease. In older age group

(Table 3) the most common pathology was Membranous.

Table 1: Histopathological diagnosis in whole group (Age 16 to 77 Years)

Pathological Diagnosis on Kidney Biopsy	**Number (Percentage)**
Membranous Nephropathy	36 (28)
Minimal Change Disease (MCD)	21 (16)
Focal Segmental Glomerulosclerosis (FSGS)	17 (15)
Membrano Proliferative Glomerulonephritis (MPGN)	15 (12)
TubulointerstitialNephritis	9 (7)
NonConclusive	13 (10)
Other	15 (12)
Total	**128 (100)**

Table 2: Histopathological diagnosis in younger age group (16 to 40 years)

Pathological Diagnosis on Kidney Biopsy	**Number (Percentage)**
Minimal Change Disease (MCD)	17 (21)
Membranous Nephropathy	17 (21)
Membrano Proliferative Glomerulonephritis (MPGN)	11(13)
Focal Segmental Glomerulosclerosis (FSGS)	10 (12)
TubuloInterstitil Disease	7(8)
Other including non Conclusive	20 (25)
Total	**82 (100)**

Table 3: Histopathological diagnosis in older age group (41 to 77 Years)

Pathological Diagnosis on Kidney Biopsy	**Number (Percentage)**
Membranous Nephropathy	19 (41)
Focal Segmental Glomerulosclerosis (FSGS)	9 (20)
Minimal Change Disease (MCD)	4 (9)
Membrano Proliferative Glomerulonephritis(MPGN)	4 (9)
Other including Non Conclusive	10 (21)
Total	**46 (100)**

4. Discussion

Our study provides important information regarding the pattern of glomerular disease in nephrotic patients presented to our institution located in Karachi Pakistan. Similar studies are published from other centers of Pakistan as well.

A review of the selected studies is presented here. Y Khan et al. published the data from Peshawar. In group less than 26 years of age, MCD was the most common finding in age group from 26 to 40 years, the most common pathology was membranoglomerulonephritis followed by membranous glomerulonephritis (MGN). Amyloidosis and membranous nephropathy were the most common diagnosis in patients more that 40 years of age [3].

N Anwar et al. from Peshawar, published their study of kidney biopsy in patients more than 40 years of age with nephrotic as well as non nephrotic proteinuria. They concluded that membranous nephropathy was the most common identity associated with nephrotic range proteinuria followed by FSGS and renal amyloidosis [4].

NK Lakhnana et al. from Islamabad reviewed the cases of nephrotic syndrome in ages from16 and 70. Membranoproliferative glomerulonephritis and membranous nephropathy were the most common histopathological diagnosis [5]. Authors from Karachi published the study of adult nephrotic patients, the most common pathologies were FSGS, Membranous Nephropathy and MCD [6].

AZ Khan et al. from Peshawar reviewed the data from their institution. In adult patients with nephrotic syndrome the most common findings were membranoproliferative GN, Membranous nephropathy and FSGS in that order [7]. SZ Akhtar et al. from Peshawar reviewed the kidney biopsies of nephrotic patients of more than 60 years of age. MCD was the most common histopathological pattern followed by membranous nephropathy [8]. Another reference reported its data from Karachi, FSGS was the most common cause of nephrotic syndrome followed by membranous and MCD in adults [9].

Over all the four most frequent histopathological pattern in these studies including ours were membranous, FSGS, minimal Change disease and membranoprolifarative glomerulonephritis. Not surprisingly MCD was more common in younger age group. One study showed MCD was most common in elderly patients, and in that case secondary MCD is always suspected [8].

We cannot compare one study with other; neither can we generalize the results. Nevertheless these studies give useful information for the clinicians and researchers. Our finding will help the physicians in decision making for doing the kidney biopsy.

5. Conclusion

We analyzed the renal biopsy data of nephrotic adult patients who presented to a tertiary care center of Pakistan. The most common pathologies were membranous nephropathy, minimal change disease and focal segmental glomerulosclerosis.

Our study will help in better understanding the spectrum of renal disease in Pakistan. However population based and controlled studies are needed to reach the true nature of disease pattern.

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