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Original Article

Renal Pathology in Adult Onset Idiopathic Nephrotic Syndrome A Study of 100 Cases

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Abstract

This study was carried out in the nephrology unit to Rajshahi Medical College Hospital, Rajshahi during the period 2003-2005. Renal biopsy was done in one hundred adult patients with Nephrotic syndrome to evaluate the histopathological pattern. Mesangioproliferative GN was the commonest underlying cause which is found in 36 (40%) cases. MPGN is followed by minimal change disease in 22 (24.44%), membranous GN 16 (17.77%), membranoproliferative glomerulonephritis 12 (13.33%), Focal segmental glomerulosclerosis 3 (3.34%) and IgA nephropathy 1 (1.12%) cases. This is concordant with other studies.

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Introduction

Like fever, Nephrotic syndrome (NS) is not a disease, rather it is the manifestation of a wide variety of underlying disease process. NS is a clinical condition characterized by massive urinary loss of protein (primarily albumin), which leads to hypoproteinemia (hypoalbuminemia) and edema. Hyperlipidemia, hypercholesterolemia, and increased lipiduria usually are associated. Nephrotic syndrome results from a wide range of etiological factors. Histological examination of the biopsied kidneys remains the gold standard for renal diagnosis. In 1951, Inverson and Brun reported the first large series of needle biopsies of the kidney.[1]

The primary aim of this study is to determine the etiology of adult nephrotic syndrome and the histological pattern of idiopathic adult nephrotic syndrome. The idiopathic nephrotic syndrome has distinctive histopathologic and immunologic variations upon which steroid responsiveness and prognosis depends.

Materials and methods

This study was carried out in the nephrology unit to Rajshahi Medical College Hospital, Rajshahi during the period 2003-2005. One hundred adult (age more than 18 years) patients with nephrotic syndrome as diagnosed by massive proteinuria >3.5 gm/day, serum albumin <30gm/L, evidence of fluid retention or oedema were included in this study. All the cases were studied with meticulously taken history and clinical findings. Patients who self-discharged themselves before the diagnostic workout was complete were excluded from the study. All the patients were investigated for the possible causes of secondary nephrotic syndromes like blood sugar 2 hours after

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break fast, HBsAg, anti HCV and for selected patient with suspected systemic lupus erythematosus- Anti nuclear factor (ANF), and anti-ds DNA. All the patients were evaluated with routine and microscopic examination of urine, blood urea, serum creatinine, urinary total protein, serum cholesterol, serum total protein, serum albumin, serum globulin, serum albumin-globulin ratio ultrasonography of the genitourinary system for the estimation of kidney size. Kidney biopsy was done in all cases. Kidney biopsy was done keeping the patient in prone position with "True Cut needle biopsy" with all aseptic precaution. Two samples were taken one in normal saline and another in 10% formalin. Sample in normal saline was freezed and sent to Dhaka by keeping the freezing temperature. Sample in formalin was sent to Dhaka normally. Both the samples were sent to Brig Gen (Dr.) Muhammad Jalal Uddin, Deputy Commandant and classified specialist in pathology, Armed forces Institute of Pathology, in JR Pathology Services, 16, Green Super Market, 3rd Floor, Green road, Dhaka- 1205. Both light microscope and direct immunofluorescence study were used for biopsy report.

Result

A total one hundred adult patient with nephrotic syndrome who had undergone needle biopsy in the nephrology unit Rajshahi Medical College Hospital were analyzed. Of these 62 (62%) patients were males and 38 (38%) patients were female.

Table-I

Lesion	Number of Patients	Male	Female
Primary or Idiopathic	90	61	29
Secondary	10	1	9

Table-I shows, the etiology of adult nephrotic syndrome. 90 out of 100 cases had primary or idiopathic NS and the remainder had nephrotic syndrome due to some other diseases (secondary NS).

Table III revealed the biochemical profile of the patients. Mean serum creatinine of the 100 patients were 1.3±.58 mg/dl, Serum cholesterol 420±120 mg/dl, 24 hours urinary total proteins 5.2±1.5 gm/24 hour, Serum total protein 48.5±7.8 gm/L and serum albumin 20.8±6.1 gm/L.

Table-II

Age group	Total number of patients	Primary or Idiopathic	Secondary
18-27	55	46	09
28-37	16	16	0
38-47	14	13	01
48-57	15	15	0

Table-II shows the age of the patients. Most of the patient (55%) in this study was between 18-27 years of age group.

Table III: Biochemical Profile of the patients

Total No of Patients	Serum creatinine mg/dl	Serum cholesterol mg/dl	24 hours total urinary proteins gm/24 hrs	Serum total protein gm/L	Serum albumin gm/L
100	1.3±.58	420±120	5.2±1.5	48.5±7.8	20.8±6.1

Table IV shows the relative proportion of different morphological pattern of glomerulonephritis in 90 adult idiopathic nephrotic syndrome patients. Here we can see that Mesangioproliferative GN was the commonest underlying cause which is found in 36 (40%) cases. MPGN is followed by minimal change disease in 22 (24.44%), membranous GN 16 (17.77%), membranoproliferative glomerulonephritis 12 (13.33%), Focal segmental glomerulosclerosis 3 (3.34%) and IgA nephropathy 1 (1.12%) cases. This is concordant with other studies.

Table IV: Histological types of found in the study group

Glomerular morphology	**No of Patient**	**Percentage**
Mesangioproliferative glomerulonephritis	36	40%
Minimal change disease	22	24.44%
Membranous glomerulonephritis	16	17.77%
Membranoproliferative glomerulonephritis	12	13.33%
Focal segmental glomerulosclerosis	03	3.34%
IgA nephropathy	01	1.12%
Total	90	100%

Table V: Showing age incidence and frequency of different histopathological type in particular age group.

	Age of the patients			
Lesion	18-27 years	28-37 Years	38-47 Years	48-57 years
Mesangioproliferative	19	07	05	05
glomerulonephritis	41.36%	43.75%	38.46%	33.33%
Minimal change disease	15	03	02	02
	32.60%	18.75%	15.38%	13.33%
Membranous glomerulonephritis	02	04	05	05
	4.34%	25%	38.46%	33.33%
Focal segmental	02	00	00	01
Glomerulosclerosis	4.34%	-	-	6.66%
IgA Nephropathy	01	00	00	00
	2.15%	-	-	-
	46	16	13	15
Total	100%	100%	100%	100%

Table V shows that mesangial proliferative glomerulonephritis was the most common histological pattern in all the age group shown, but the incidence of minimal change disease decrease with age and that of membranous GN increases with age.

Discussion

A total of one hundred adults (>18 years of age) presenting with nephrotic syndrome were included in this study. The mean age of the patients was 30 ± 11 years. Among, the total patients, 62 were male and 38 were female, indicates males are affected more than female. Among one hundred patients, ninety of them were idiopathic nephrotic syndrome and the remaining ten were due to secondary diseases. In our study, the secondary diseases are systemic lupus erythematosus (9) and leprosy (01). Though worldwide the main secondary cause of nephrotic syndrome is diabetes mellitus, but we did not have any patient in our study, probably due to in our country diabetic patients tend to rush to diabetic hospitals, and also due to the fact that, diabetic patient rarely need a kidney biopsy for evaluation. Again biopsy is not indicated in long standing insulin dependent diabetics with associated retinopathy or neuropathy, since the diagnosis is in little doubt.

It is evident from the present study that mesangioproliferative glomerulonephritis 36(40%) is the commonest histological type of glomerulonephritis leading to adult nephrotic syndrome. This is followed by minimal change disease 22 (24.44%), membranous glomerulonephritis 16 (17.77%) membranoproliferative 12 (13.33%), Focal segmental glomerulo sclerosis 3 (3.33%) and IgA nephropathy 1 (1.11%). The etiological pattern is almost similar to those of with other studies.[2,3] Mesangioproliferative glomerulonephritiswas seen mostly in young adults with mean age of 28.63 years for males and 26.3 years for females. Male predominance was noted (M:F ratio - 1.4:1).[4] The incidence of FSGS in our study is comparatively scanty probably due to when the prevalence of segmentally scarred glomeruli is 10%, there will be a 35% probability that no abnormal glomeruli will be found in biopsy sample that contains only 10 glomeruli, resulting in diagnosis of minimal change disease. The probability of missing the glomerular lesion drops to 12% or less when 20 or more glomeruli are present in biopsy sample. Further more the lesion initially affects the juxtramedullary glomeruli which is deep enough to be obtained. In our study, one patient with nephrotic is syndrome due to IgA nephropathy. Though IgA nephropathy is the most common type of primary glomerulonephritis in many parts of the world, but a few of them presented with nephrotic syndrome. Most of them are presented with recurrent microscopic haematuria, preceded 1 or 2 days earlier by infections ("Synpharyngitic nephritis"). Al Menawy et al reported that 2.7% of children < 16 years had IgA nephropathy,[5] and in another study on 300 cases. Abdur Rahman reported a 3% incidence of IgA nephropathy.[6] It is evident that minimal change disease were present mainly in younger group and the incidence of membranous glomerulonephritis ware increased as age increases where as other types of glomerulonephritis did not show any age predilection among adult patients.

Conclusion

Clinical features and biochemical values does not give any clue to the underlying histological types of glomerulonephritis. So we feel that all patients with adult nephrotic syndrome should undergo renal biopsy. Percutaneous renal biopsy is safe with minimal risk of serious complications. Although debated, a baseline renal biopsy should be performed in all patients with significant proteinuria to discriminate between

different types of lupus nephritis. The results permit us to establish a specific diagnosis, which helps in counseling the patients about the likely prognosis of their disease and to select a specific therapeutic regimen.

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