Histopathological Diagnosis of Steroid Resistant Nephrotic Syndrome in Children

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Nephrotic syndrome is primarily a pediatric disorder. Vast majority of affected children will have steroid responsive MCNS. Steroid resistance is present in 10% of total patients suffering from nephrotic syndrome. This study was conducted to determine the frequency of different glomerulopathies causing steroid resistance. According to this study, out of total 30 patients having steroid resistant nephrotic syndrome and undergone renal biopsy, majority had FSGS. MPGN was second common cause of steroid resistance.
Key words: Nephrotic syndrome, steroid resistant.

Nephrotic syndrome is primarily a pediatric disorder and is 15 times more common in children than adults. The incidence in USA is 2-3/100,000 and prevalence is 16/100,000[1]. It is said to be as common in Pakistan as in Western Cuuntries[2]. Vast majority of affected children will have steroid responsive minimal change nephrotic syndrome (MCNS). The steroid resistant group is composed largely of children with other glomerular diseases which includes focal segmental glomerulosclerosis (FSGS), membranoproliferative glomerulonephritis (MPGN) and diffuse mesingeal proliferative glomeralonephritis. There is wide age variation in the incidence of various glomerular diseases. The most striking deference is the decline in frequency of minimal change nephrotic syndrome (MCNS) with advancement of age. The change with age in the probability that a patient with nephrotic syndrome has a steroid responsive. glomerular disease (particularly minimal change disease) can be used in deciding whether to institute a trial of steroid before renal biopsy or to perform a renal biopsy initially to spare the patient a possible unnecessary course of steroids. Thus most patients in early childhood with nephrotic syndrome benefit from a trial of prednisolon therapy, whereas an initial biopsy may be indicated in the older children and adolescents.

Renal biopsy is essential in patients who are steroid resistant. The histological diagnosis of underlying glomerular disease guides about the specific treatment options, complications and prognosis.

Aims and objectives:
To determine the frequency of different underlying glomerulopathies present in steroid resistant nephrotic syndrome patients.

Materials and methods:
This study was conducted in pediatric department of Jinnah Hospital Lahore Retrospective data analysis done of the patients having nephrotic syndrome who were registered in nephrotic clinic at Jinnah Hospital from 1997 to 2002 and had regular follow up for at least 2 years.

All those patients were included in the study who were:

(i) Initial steroid resistant or late steroid resistant.
(ii) Renal biopsy was done and histopathological diagnosis was made.

Definitions
Initial steroid resistant
Patients with nephrotic syndrome treated with prednisolon 60mg/m^2/day in divided doses for 8 weeks and did not went into remission.
Latest steroid resistant
Patient with nephrotic syndrome who initially showed response to prednisolon and later become steroid resistant in subsequent relapses.

Results:
Total 30 patients were included in the study. Twenty two were initial steroid resistant and 8 patients were late steroid resistant (Table 1). Out of total 30 patients 18 were male and 12 were female. Male to female ratio is 1.5 to 1 (Table 2).

Among total 30 patients, focal segmental glomerulosclerosis (FSGS) was present in 18 patients. Membranoproliferative glomerulonephritis (MPGN) was present in 8 patients. Two patients had minimal change nephrotic syndrome (MCNS) and membranous glomerulonephritis (MGN) each.

Table 1 Steroid resistance (n=30)

	n=
Initial steroid resistant	22
Late steroid resistant	8

Table 2. Sex ratio (n=30)

Gender	n=
Male	18
Female	12
Male to female ratio	1.5:1

Table 3. Frequency of different histopathological diagnosis (n=30)

Frequency	n=	%age
FSGS	18	60
MPGN	8	26
MCNS	2	13
MGN	2	13

Table 4. Initial steroid resistant (n=22)

Frequency	n=	%age
FSGS	12	54.5
MPGN	8	36.4
MGN	2	9.1

Table 5. Late steroid resistant (n=8)

Frequency	n=	%age
FSGN	6	75
MCN	6	25

The median age for focal segmental glomerulosclerosis is 7 years and for membranoproliferative glomarulonephritis is 9 years. Membranous glomerulonephritis was present in patients having age more than 13 years.

In 22 initial steroid resistants FSGS was present in 12 (54.5%) and MPGN was present is 8 (36.4%). Two (9.1%) belong to membranous glomerulonephritis (Table 4). In 8 late steroid resistant patients, 6 (75%) belong to FSGS and 2 (25%) belong to MCNS.

Discussion:

Steroid resistant nephrotic syndrome is a chronic progressive disorder affecting upto 10% of all children with nephrotic syndrome[3,4]. Approximately 90% of children with MCNS respond to initial corticosteroid therapy. In contrast only 20% of children with FSGS and 7% of those with MPGN experience clinical response with corticosteroid therapy[1].

Within the context of nephrotic syndrome the use of renal biopsy has been helpful in establishing the underlying glomerulopathy which determine the prognosis and in some cases suggesting specific therapy. It is also useful in establishing relationship between clinical and laboratory findings and underlying histology.

In our study the majority of patients, 22 (73%) belong to initial steroid resistant nephrotic syndrome group in comparison with late steroid resistant nephrotic syndrome patients which are 8 (27%).

Focal Segmental Glomerulosclerosis (FSGS) is the main underlying glomerulopathy which is present in 18 (60%) patients and it is present in 12 (54.5%) out of 22 patients who have initial steroid resistance. According to martin et al, FSGS occurs in 40% of those who continue to have protein urea after 8 weeks of corticosteroid therapy[5]. In one study out of 12 patients with FSGS only 2 responded to steroid therapy and both relapsed[6].

Membranopraliferative glomerulonephritis is second common pathology in steroid resistant nephrotic syndrome which is present in 8 (36.5%) patients and all belong to initial steroid resistant group. In study of white RH et al [5] only one out of 7 with MPGN responded to steroid therapy.

Minimal change nephrotic syndrome (MCNS) was present in only 2 patients out of 8 patients which had resistance to steroid therapy in subsequent relapses.

Male to female ratio in our study is 1.6:1 which corresponds to ratio in Mongeau JG et al study[7].

Median age of FSGS is 7 years as compared to MPGN which is 9 years which corresponds to study done by Habib R. et al.[8].

Membranous glomerulonephritis is more common in adults. In this study it is only present in 2 patients who has age > 13 years.

Conclusion:

Steroid resistant nephrotic syndrome usually have an underlying pathology other than MCNS. FSGS is the main underlying glomeralopathy in steroid resistant nephrotic syndrome.

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