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Original Research Article

Clinical and demographic profile of nephrotic syndrome in a rural tertiary care center

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ABSTRACT

Background: Nephrotic syndrome is a common renal disease in children, associated with high risk of death, most commonly from infections, if not identified and treated promptly. It is a disease that not only affects the physical health but also psychology of the child and that of the family and there is lack of information on nephrotic syndrome in children in a rural setup.
Methods: This hospital based observational study was conducted from September 2020 to December 2021, in department of pediatrics in KIMS, Narketpally. A total of 40 eligible children diagnosed with nephrotic syndrome between 3 months to 12 years were taken up for this study. Detailed information of the patient, including thorough history, clinical examination, investigations, response to treatment and complications of the disease were recorded in a pre-designed proforma and the data was analyzed.
Results: It was observed that out of 40 subjects, the most common age group affected was 6-9 years (42.5%), majority of which were male children (72.5%). Most common presenting symptom was edema seen in 100% patients, followed by oliguria in 50%. Most common complication noted was ascites (62.5%) followed by hypertension (42.5%). UTI was observed in 52.5% of cases. 75% of the patients were newly diagnosed and 25% were relapses.
Conclusions: In the present study, clinical and demographic profile of nephrotic syndrome was congruent with nephrotic syndrome in children in other studies. The response to treatment and associated complications did not differ significantly in a rural center when compared to other studies.

Keywords: Nephrotic syndrome, Clinical profile, Complications

INTRODUCTION

Nephrotic syndrome (NS) is a common renal disorder with an annual incidence of 1.2 to 16.9 per 100,000 children.[1] It is 15 times more common in children than adults.[2] The characteristic triad of NS is massive proteinuria, (>40 mg/m^2/hr, urine protein: creatinine ratio (Up/Uc) >2, nephrotic range proteinuria), hypoalbuminemia <3 g/dl and edema.[1] The underlying abnormality in NS is an increased permeability of the glomerular capillary wall, which leads to massive proteinuria and hypoalbuminemia.[3] Almost 90-95% of the cases of NS in children are primary or idiopathic with no identified cause, the most common glomerular lesion being minimal change disease. The other 5-10% are associated with an underlying systemic illness.[1,4] Remission is defined as nil/trace urinary protein (Up/Uc <0.2) for 3 consecutive morning samples.[1] Relapse is defined as urine protein >3+ (Up/Uc >2) for 3 consecutive morning samples.[1] Infrequent relapse is a responder with one relapse in 6 months.[4] Frequent relapse is 2 or more relapses in first 6 months after stopping initial therapy, >3 relapses in any 6 months, or >4 relapses in 1 year.[1] Children with NS show remission of proteinuria following 6 weeks of treatment with corticosteroids are classified as 'steroid-sensitive'.[5] Children with NS, especially if receiving immunosuppressants are susceptible to infections,

especially with capsulated organisms like *Pneumococcus*, *Meningococcus*. Hence, vaccination becomes essential.[5] Complications such as anasarca with ascites and serious effusions, infections like peritonitis, cellulitis, bone and joint infections, acute kidney injury, severe hypovolemia and thrombosis of major vessels are seen.[4]

NS is a disease that not only affects the obvious physical health, but also affects the family and psychology of the child and there is lack of understanding about the disease condition especially in a rural setup.[6] Hence this study was taken up to assess the clinical presentation, therapeutic response, and complications in a child in with nephrotic syndrome in a rural area.

Objectives

The objectives were to determine the demographic profile of children diagnosed with nephrotic syndrome, to analyze the clinical presentation of children with nephrotic syndrome and to study the associated complications.

METHODS

This hospital based observational study was conducted in the department of pediatrics, in Kamineni Institute of Medical Sciences, a rural tertiary care centre from September 2020 to December 2021. The study included a total of 40 eligible children, aged 3 months to 12 years, with newly diagnosed as well as previously diagnosed nephrotic syndrome and children who responded to steroid treatment within 4 weeks of initiation of therapy. The study excluded patients with congenital and adolescent nephrotic syndrome, children with known cases of steroid resistant nephrotic syndrome and children with secondary causes of nephrotic syndrome. Detailed information regarding cases diagnosed with steroid sensitive NS was taken from the hospital's medical records. Diagnosis of nephrotic syndrome was based on the following criteria of massive proteinuria (>40 mg/m^2/hr), hypoalbuminemia (<3 g/dl) and presence of edema. The study was approved by the Institutional Ethics Committee

A thorough history, complete clinical examination, and details of investigations of presenting illness, with response to treatment and complications of the disease were noted in a pre-structured proforma. The data from these filled proformas was analyzed in Microsoft Excel.

RESULTS

A total of 40 children between the ages of 3 months to 12 years, diagnosed with NS were taken for the study. Majority of the subjects presented between 6-9 years of age (42.5%), followed by 3-6 years of age (27.5%). Among these, 72.5% of children were male and 27.5% were female with a male to female ratio of 2.6:1 (Figure 1).

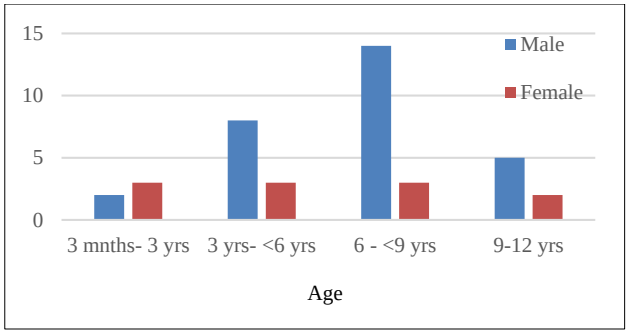

Figure 1: Distribution of cases based on age and gender.

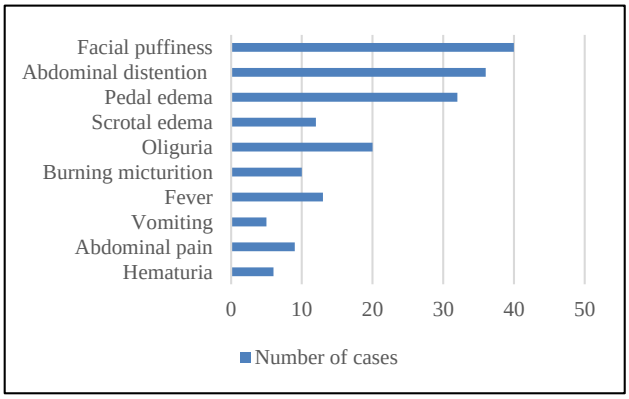

Figure 2: Presenting symptoms in NS.

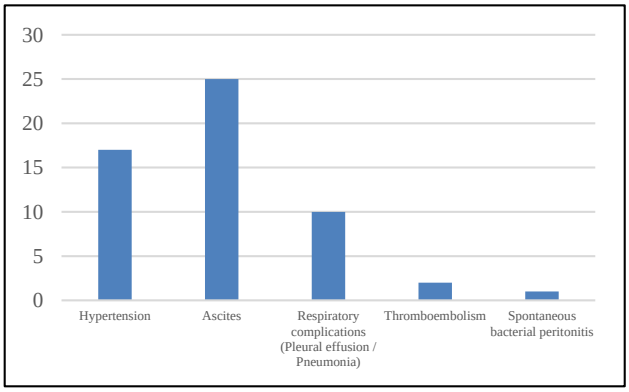

Figure 3: Complications of NS.

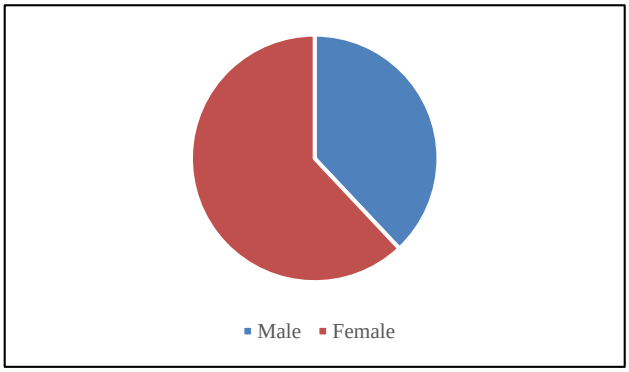

Figure 4: Gender wise distribution of UTI.

Table 1: Relapse of NS.

Episode	Number (N)	%
First episode	30	75
Infrequent relapses	8	20
Frequent relapses	2	5

Table 2: Time of response to steroids.

Time of response (weeks)	Number (N)	%
1	5	12.50
2	22	55
3	11	27.50
4	2	5

The most common presenting symptom was facial puffiness seen in 100% of patients, followed by abdominal distension (90%), pedal edema (80%), oliguria (50%), scrotal edema (41.3% of male subjects), fever (32.5%), burning micturition (25%), abdominal pain (22.5%), hematuria (15%) and vomiting (12.5%), (Figure 2). On examination, bilateral pitting edema was present in 60% of the cases.

Of the 40 subjects included in the study, it was noted that 75%of the children presented with first episode of nephrotic syndrome, 20% with infrequent relapses and 5% with frequent relapses (Table 1).

After initiation of corticosteroid therapy, it was observed that remission was achieved after 2 weeks of treatment in 47.5%of cases, followed by 27.5% responding to treatment in the 3rd week, 12.5% in 1st week. A very low percentage of patients (5%) respond to treatment in the 4th week (Table 2).

All subjects were evaluated for complications. Most common was observed to be ascites comprising of 62.5% of cases, followed by hypertension (42.5%), respiratory complications like pleural effusion and pneumonia (25%), thromboembolism in 5% of cases and spontaneous bacterial peritonitis seen only in 2.5% of the cases (Figure 3).

In the present study it was observed that 21 children had UTI. Out of these cases with UTI, it was observed that 13 were male children and 8 were female children (Figure 4).

DISCUSSION

In the present study, out of 51 cases diagnosed with NS during the study period, 40 subjects that fulfilled the inclusion criteria were taken up. Majority of the cases belonged to 6-9 years age group with a mean age of 6.3 years and a male predominance. In similar studies done by Patil et al, Agarwal et al and Sahana it was also observed that there was a male sex dominance in nephrotic syndrome.[2,6,11] It was observed that the most common presenting symptom was edema in the present study as well as studies done by Patil et al, Agarwal et al and Sahana which occurs due to loss of proteins, decreasing the plasma oncotic pressure, causing an extravasation of plasma water into the interstitial space.[2,6,7,11] Other symptoms were oliguria, fever, burning micturition, abdominal pain, hematuria, and vomiting. On clinical examination, bilateral pitting type of edema was noted most in the present study.

NS increases a child's susceptibility to infection. IgG (a type of protein) is lost in the urine, so the body's ability to fight against microorganisms is reduced and the child becomes susceptible to infections because of immune suppression. The most common infection in children with nephrotic syndrome is urinary tract infection (UTI).[8,9] In the present study it was observed that 52.5% of children had UTI. Out of the 21 cases with UTI, it was observed that 62% were male children and 38% were female children. After acute respiratory infections, UTI is the most frequent infectious trigger of relapses.[10] In a similar study done by Patil et al UTI was seen in 25% of the cases, in a study done by Agarwal et al UTI was seen in 24.35 of the cases and in a study done by Sahana UTI was observed in 25% of the cases.[2,6,11] This higher percentage of urinary tract infection seen in the present study could most probably be due to the low socioeconomic background of the child, lack of hygiene and lack of proper sanitation.

Ascites was noted in 62.5% of cases, out of which 25% developed respiratory complications (pleural effusion/pneumonia) requiring oxygen supplementation and albumin transfusions. In the present study hypertension was noted in 17 cases. According to Nelson, hypertension can be present in about 10% of MCNS while in nephrotic syndrome due to significant glomerular lesion, the incidence of HTN varies from 20-35%.[3,11] In a similar study done by Patil et al ascites was seen in 63% cases and hypertension in 53.13% of cases, in a study done by Agarwal et al ascites was seen in 55.10% cases and hypertension in 275 cases and in a study done by Sahana it was observed that ascites was seen in 63% of cases and HTN in 12% cases.[2,6,11]

Majority of the patients presented with first episode of nephrotic syndrome (75%). Infrequent relapses were seen in 8 patients and frequent relapses were seen only in two.

After initiation of corticosteroid therapy according to revised Indian Society of Pediatric Nephrology guidelines, all cases responded to treatment within 4 weeks, with an average time for remission being 10-14 days.

Limitations

Children who were diagnosed with nephrotic syndrome but were resistant to steroid therapy and were on other drugs were not taken into consideration. A small sample

size was another limitation and the study did not differentiate between treatment related and disease related complications.

CONCLUSION

In our study, the most common presentation of nephrotic syndrome was between 6-9 years with a mean age of 6.3 years and a male to female ratio of 2.6:1. All patients presented with insidious onset of edema, started with facial puffiness (100%) and gradually spreading to abdomen, limbs and genitalia. Ascites (62.5%) was the most common complication observed, followed by hypertension (42.5%). UTI was seen in 52.5% cases. It was observed that majority of cases, presented with first episode of NS (75%) and all the cases responded to corticosteroid therapy within 4 weeks, with an average achievement of remission between 10-14 days.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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