

Prevalence of Urinary Tract Infection in Children With Nephrotic Syndrome In A Tertiary Care Centre In South India

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Abstract: Background: Nephrotic Syndrome is one of the most common renal disorders in pediatric age group, which predisposes to various systemic infections. Of all the infections urinary tract infections remains the most important cause for most of the relapses. The present study was conducted to find out the prevalence of urinary tract infections and their microbiological profile in children with Nephrotic Syndrome.

Methods: A cross sectional descriptive study which included all children less than 12 years of age admitted with Nephrotic Syndrome between August 2017 and July 2018. All the data regarding history, clinical findings and investigations were recorded in a pre-designed Performa. A clean catch mid-stream urine sample was collected from all the children at the time of admission for culture and sensitivity pattern.

Results: Among the 32 children with Nephrotic Syndrome, urinary tract infection was detected in 8 children (25%). The most common micro-organism isolated was *Escherichia coli* (62.5%), followed by *Klebsiella* (25%) and *Proteus* (12.5%). Conclusion: About 25% of children with Nephrotic Syndrome have urinary tract infection at the time of admission. Gram negative enteric bacilli remain the most common agent. As urinary tract infection is found in a considerable rate among children with Nephrotic Syndrome, routine urine culture should be carried out in all children with Nephrotic Syndrome.

Keywords: Nephrotic Syndrome, Urinary Tract Infection, Urine Culture

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I. Introduction:

The Nephrotic Syndrome is caused by renal diseases that increase the permeability across the filtration barrier. It is classically characterized by

- Nephrotic range proteinuria
- Hypoalbumemia
- Oedema
- Hyperlipidemia

In developed countries the incidence is 20-40 per million population, whereas in Asian countries it is 90-160 per million population¹. Children with Nephrotic Syndrome are at increased risk of infection due to

Reduced serum concentration of immunoglobulinG IgG

Impaired ability to make antibodies

Decreased level of alternative complement pathway factors B & D

Immunosuppressive therapy.

Of the various infections in Nephrotic Syndrome, the occurrence of urinary tract infection is about 30%; however it often goes un-diagnosed. The diagnosis of urinary tract infection is often missed in children, since the urinary symptoms are minimal and non-specific. Urinary tract infection if left untreated in children with Nephrotic Syndrome who has been started on steroid therapy will complicate the course². Most of the relapses in Nephrotic Syndrome are often precipitated by infections. Although there have been many studies pertaining to infections in Nephrotic Syndrome, there is paucity in the trends of occurrence and etiology of urinary tract infection in children with Nephrotic Syndrome. Our study focused on the above issue to find the prevalence of urinary tract infection in children with Nephrotic Syndrome.

II. Materials & Methods:

It was a cross-sectional descriptive study conducted over a period of one year after approval from the institutional ethics committee.

Inclusion Criteria:

All children less than 12 years of age admitted with Nephrotic Syndrome between Aug 2017 and July 2018.

Exclusion Criteria:

Children with urogenital malformations.

Children who were already on antibiotics.

A total of 32 children satisfying the above criteria were included in the study. All the data regarding history, clinical examination and investigations were recorded in a pre-designed Performa. All the children were subjected to urine culture.

For culture a clean-catch mid-stream urine specimen was collected in a sterile container. The samples were plated within 1 hour of collection. Urinary tract infection was labeled when single bacterial colony count was > 10⁵ organisms/ml. Qualitative data were presented as frequency or percentage and were compared using Fischer exact and binomial tests. P value < 0.05 was considered significant.

Table : 1 Occurrence of UTI in children with Nephrotic Syndrome

Urine C/S > 10 ⁵ org/ml	No. of children	Percentage
Yes	8	25
No	24	75
Total	32	100

P = 0.045

Table : 2 Gender distribution of UTI in children with Nephrotic Syndrome

Urine C/S > 10 ⁵ org/ml	Male	Female	Total
Yes	3	5	8
No	17	7	24

P = 0.7

Table : 3 Microbiological Pattern

Organisms grown	No.	Percentage
E.coli	5	62.5
Klebsiella	2	25
Proteus	1	12.5

III. Results:

During this study period, 32 children were admitted with Nephrotic Syndrome and all were included. Boys were affected more than girls with a ratio of 1.67:1. Out of 32 children included in the study, 8 had culture positive urinary tract infection (3 males & 5 females). The most common organism isolated was Escherichia coli (62.5%) followed by Klebsiella (25%) and Proteus (12.5%) which was statistically significant (P=0.045). There was no significant difference with regard to gender distribution.

IV. Discussion:

In the present study of over 32 children with Nephrotic syndrome, urinary tract infection was found in 25% of cases which is consistent with the findings of Moorani et al³ (25%) and Sawai S Lara et al⁴. whereas higher incidence of urinary tract infection were reported by Viswanth et al⁵. (30%) and Senguttuvan et al⁶. (46%). When compared to our study Alwathi et al⁷. and Paul et al⁸. reported lower prevalence i.e., 9.5% and 7.14% of urinary tract infections in their studies. In both these studies only children with the first attack of Nephrotic Syndrome were included which could be the reason for the low prevalence of urinary tract infection.

Among the microbiological profile E.coli was the most common organism isolated followed by Klebsiella and Proteus which is comparable to the observations of Moorani et al³., Gulati et al⁹., Senguttuvan et al⁶. Paul et al⁸. and Salarzaei et al¹⁰.

The limitation of this study is a relatively small sample size. Further studies with large sample size will be needed for better clarity.

V. Conclusion:

Urinary tract infection is an important, but most often under diagnosed infection in children with Nephrotic Syndrome. Urinary tract infection should be ruled out in every child with Nephrotic syndrome before initiating specific therapy. Gram negative enteric bacilli remain the most common agent.

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