

FREQUENCY OF NEPHROTIC SYNDROME IN CHILDREN

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ABSTRACT

Objective: To find out the frequency of childhood nephrotic syndrome and its relation to different solar months.

Material and Methods: This study was conducted in paediatrics department of Postgraduate Medical Institute, Lady Reading Hospital, Peshawar from 1st August 1995 to 31st July 1996. All children with proteinuria and oedema were studied. All children were thoroughly examined and investigated.

Results: Total number of admissions due to various diseases were 3441. Out of these 61(1.8%) children fulfilled the criterion of childhood nephrotic syndrome. Number of admissions varied in different solar months. 3 (4.9%) cases were admitted in August, 6 (9.9%) in September, 4 (6.5%) in October, 3 (4.9%) in November and December each, 10 (16.4%) in January, 6 (9.9%) in February and March each, 7 (11.5%) in April, 5 (8.2%) in May, 7 (11.5%) in June and 1 (1.6%) in July. Five (8.2%) children were in age range of 1-2 years, 27 (44%) were in age range 2-6 years, 17 (27%) in age range of 6-8 years and 12 (19.2%) above 8 years of age.

Conclusion: Nephrotic syndrome is fairly common in children with male preponderance. Most admission due to nephrotic syndrome were in the month of January.

Key words: Nephrotic Syndrome, Proteinuria, Childhood.

INTRODUCTION

Nephrotic syndrome (NS) refers to the presence of proteinuria, hypoproteinaemia, oedema, and hyperlipidaemia. It is the second most common primary renal paren-

chymal disease in children aged 15 years or less.¹ The disorder is very common in developing countries and is more common in Asian children than Caucasian having a definite racial incidence.^{2,3,4} The syndrome results from increased permeability of glomerular basement membrane resulting

in excessive filtration of plasma proteins with all the consequences of proteinuria and hypoproteinaemia. This may be caused by immune mechanism or is secondary to some other diseases, toxins, drugs etc⁵⁵ Kari JA. Changing trends of histopathology in childhood nephrotic syndrome in western Saudi Arabia. Saudi Med J 2002;23:317.

It is favoured by the decrease in CD4 cells and increase in CD8 cells, natural killer cell and B-Lymphocytes. The CD4+/CD8+ ratio is reduced. A significant increase in TNF-alpha levels is found in patients with NS⁷. Hepatitis B virus (HBV) is also found to be a factor contributory to NS.⁸ Recently, it has been proposed that nephrotic syndrome is a consequence of an imbalance between oxidant and anti-oxidant activity and there is oxidant stress.^{9,10} Childhood NS in majority of cases shows good response to treatment with steroids and if left untreated or managed inadequately can result in various complications.^{11,12,13,13} Rai US, Kumar U, Kumar H, Kumar O, Shahi SK. Covert bacteriuria in nephrotic syndrome. Indian J Pathol Microbiol 2001;44:289. ¹⁴ In those children, where renal biopsy is indicated the most commonly observed histopathological diagnoses is IgA nephropathy and focal glomerulosclerosis.¹⁵

The study was conducted to find out the frequency of childhood nephrotic syndrome, its relation to different solar months and its distribution regarding the age and sex in the admitted patients.

MATERIAL AND METHODS

This study was carried out in Paediatric Department of the Postgraduate Medical Institute Peshawar, from 1st August 1995 to 31st July 1996. All children with proteinuria and oedema were studied. Inclusion criterion was proteinuria of 2⁺ or more and serum albumin of 3 g/dl or less. All such children were thoroughly examined and investigated.

History of each patient was taken on a proforma designed and prepared to get required information in a proper systematic sequence. Investigations carried out were urine routine examination, blood complete, ESR, 24 hours urinary protein, blood urea, serum creatinine, serum electrolytes, X-Ray KUB and in selected case IVP, abdominal ultrasound and renal biopsy.

Definitions

NS was defined as proteinuria of >40 mg /m²/24 h ,or >50mg/kg/day together with a serum albumin of <3 g/dl. or early morning urinary proteins and urinary creatinine ratio of >200. Haematuria was defined as >5 red blood cells per high power field. Normal renal function was defined as a plasma creatinine of 1.3 mg/dl. Renal insufficiency was defined as a persistent rise in plasma creatinine >1.3 mg/dl, and end-stage renal disease (ESRD) was the point at which dialysis treatment was started or plasma creatinine exceeded 10 mg/dl.

RESULTS

Total number of admissions during the study period were 3441, of these 61 cases (1.8%) were due to childhood nephrotic syndrome. Of the 61 cases 48 (78.8%) were male and 13 (21.23%) were female. The data is presented in tables 1-4.

Out of 61 cases admitted due to nephrotic syndrome 56 cases had typical features of nephrotic syndrome and 5 cases had atypical features. Out of these 58 cases

TOTAL NUMBER OF ADMISSIONS AND PATIENTS WITH NEPHROTIC SYNDROME

Total patients admitted to the Department	3441
Nephrotic syndrome	61
Percentage	1.8%

TABLE-1

MONTH-WISE ADMISSIONS

Month	Number	Percentage (%)
August	3	4.9
September	6	9.9
October	4	6.5
November	3	4.9
December	3	4.9
January	10	16.4
February	6	9.9
March	6	9.9
April	7	11.5
May	5	8.2
June	7	11.5
July	1	1.6

TABLE-2

responded to steroids and 3 cases did not respond. Of those who responded 48% responded within the first two weeks, 13% responded in third week, 14% responded in fourth week and 16% between the fourth and eighth week.

Number of admissions due to nephrotic syndrome had a definite relationship to various solar months. 3 (4.9%) cases were admitted in August, 6(9.9%) admitted in September, 4 (6.5%) in October, 3 (4.9%) admitted in November and December each. 10 (16.4%) admitted in January, 6 (9.9%) in February and March each, 7 (11.5%) in April,

AGE-WISE DISTRIBUTION

Age range (Years)	No. of patients	Percentage
1-2	5	8.2
2-6	27	44
6-8	17	27
8 and above	12	19.7

TABLE-3

LABORATORY FINDINGS IN PATIENTS WITH NEPHROTIC SYNDROME

Parameter	No. of cases	Percentage (%)
Urine albumin ++	7	11.7
Urine albumin >++	44	88.3
Microscopic haematuria	14	23
Macroscopic haematuria	6	9.8
Total Serum protein <4g/dl	56	91.8
Total Serum Protein >4g/dl	5	8.2
Serum albumin <2g/dl	47	77
Serum albumin >2 g/dl	14	23
Blood urea and creatinine above normal range	6	9.8
Increased renal parenchymal echogenicity	23	37.7
Glomerular lesions other than	5	8.2
MCNS on renal biopsy		

TABLE-4

5 (8.2%) in May, 7 (11.5%) in June and 1 (1.6%) in July.

The prevalence of nephrotic syndrome also varies in various age groups in our study. 5 (8.2%) cases were in the age ranged of 1-2 years, 27 (44%) in the age range of 2-6 year, 17 (27%) were in the age range of 6-8 years and 12 (19.7%) were of age 8 years and above.

The nephrotic syndrome is predominantly a disease of male children. In our study 48 (78.7%) were male and 13 (21.3%) were female.

Laboratory findings of our patients show that in more than 88% of the patients urinary albumin was more than 2⁺ and in more than 91% of the patients had serum protein of less than 4 g/dl. In 77% of the patients serum, albumin was less than 2g/dl. In 23% of the cases there was microscopic haematuria while in 9.8% of the cases macroscopic haematuria was noted. In our

patients' blood urea and serum creatinine above normal ranges were observed in 9.8%. Renal biopsy was performed in 5 cases and these patients had lesions other than minimal change nephrotic syndromes, who did not respond to 4 weeks steroids and were candidate for such invasive procedures. Laboratory findings of the patients admitted and studied were as shown in the table No. 4.

DISCUSSION

Nephrotic syndrome is not an uncommon disorder¹⁶. It is the commonest glomerular disease and is 15 times more common in children than adults¹⁷. According to Watson, the disease is more common in Asian population than Europeans with an incidence of 9 – 16 per 100,000¹⁸. Cameron observed that about 1-4% of all hospital admissions in tropical countries are due to nephrotic syndrome¹⁹. Forfar and Arneil, noticed that, there is no well defined seasonal incidence for the onset of primary idiopathic nephrotic syndrome in children but relapses occur in clusters in winter season. Dwarkin discovered that, the disease is very common in pre-school children with peak incidence between 2 – 6 years. Iqbal et al observed in their 105 patients with nephrotic syndrome, 69 males and 36 female¹². Hafeez et al evaluated 35 with male to female ratio of 2.5:1 in the age range of 1.5 years – 14 years²⁰. Hafeez F, Rasool F, Hamid T. Renal biopsy in childhood Nephrotic Syndrome. JCPSP 2002;12:454. According to Portale et al there is male predominance and minimal change NS is more common in male while nephrotic syndrome due to other glomerulopathies is more common in female²¹. In our one year study of the total 61 nephrotic children 48 were male and 13 female and hence there was over all male predominance.

We faced problems with the diagnostic test of 24 hours Urine Protein collection in

children and we could succeed only in 24 cases and failed to do so in the rest of 31 cases, therefore we had to rely on dipstick technique for urinary protein estimation. According to Dwarkan it is not possible to collect 24 hours urine accurately in children but it is possible to dispense with the frustration inherent in trying to collect all the urine passed in 24 hours by determining albumin, creatinine ratio of any random sample of urine, which should be more than 200 in nephrotic children.

In our one year study at Paediatric Department PGMI Peshawar extending from 1st August 1995 to 31st July 1996, the total number of admissions due to different diseases were 3441. Of these total number of admissions due to nephrotic syndrome were 61. This makes the frequency of admissions due to nephrotic syndrome as about 1.8%.

In our study admissions due to nephrotic syndrome varied in different solar months. Admissions due to nephrotic syndrome in august were 3 (4.9%), in September 6 (9.9%) in October 4 (6.5%), in November 3 (4.9%) December 3 (4.9%) January 10 (16.4%) February 6 (9.9%), March 6 (9.9%) April 7 (11.5%), May 5 (8.2%), June 7 (11.5%) and July 1 (1.6%). In our study children aged 1-2 years were 5 in number (8.2%), those between 2-6 years were 27 (44%), those between 6-8 years were 17 (27%) and those above 8 years were 12 (19.7%), In our one year study of total 61 nephrotic children 48 children were male while 13 were female and hence there is overall male predominance.

CONCLUSION

In this study we found that frequency of childhood nephrotic syndrome, its distribution in various age group, its sex-wise distribution and its relation to various solar months are comparable to the studies from abroad.

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