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RESEARCH ARTICLE

CLINICAL PROFILE AND OUTCOME OF CHILDREN WITH NEPHROTIC SYNDROME

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ABSTRACT

The aim of the study was to assess the clinical and demographic characteristics and management of children with nephrotic syndrome admitted to a tertiary care teaching hospital in central Kerala during aperiod of five years from Jan 2012 to Dec 2016 retrospectively. The clinical records available in the medical records at the time of data collection in 2017 were reviewed. Among the 407 children studied there was a male preponderance (61.42%). The age of children ranged from 1 month to 12 years with highest proportion in the age group 2-5 years. The children were admitted with nephrotic syndrome-15.97% as first episode 65.11% as relapse,0.98% for management of steroid resistant and17.20 %, steroid dependent nephrotic syndrome, 0.24% focal segmental glomerulo sclerosis and 0.49% congenital Nephrotic syndrome. Management of nephrotic syndrome was mainly by administration of steroids (92.63%). In cases where steroid therapy was not effective in reaching remission other drugs like levamisole (7.86%) and cyclophosphamide (1.47%), were added. Children also received antihypertensives, diuretics and intravenous albumin as support therapy in management of nephrotic syndrome.

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INTRODUCTION

Nephrotic syndrome (NS) is a disease with a set of clinical symptoms proteinuria, hypoproteinemia, edema and hyperlipidemia. Estimates on the annual incidence of NS range from 2-7 per 100,000 children, and prevalence from 12-16 per 100,000 (Bagga and Mantan, 2005). The condition is primary (idiopathic) in 95 % cases and in 5% cases associated with other diseases like SLE, HSP, amyloidosis. Primary Nephrotic Syndrome can be minimal change nephrotic syndrome, focal segmental glomerulosclerosis and membranoproliferative glomerulonephritis (Bagga and Mantan, 2005). Nephrotic syndrome presenting in the first three months of life is known as congenital nephrotic syndrome caused mainly by intrauterine infections. In minimal change nephrotic syndrome some children respond to steroid therapy while others may be steroid dependent or steroid resistant. Along with the clinical manifestation of edema, physicians may look for the levels of serum albumin, urine albumin, protein creatinine ratio and 24-hour urine protein levels to diagnose a case of nephrotic syndrome. Serum cholesterol level is high in cases of nephrotic syndrome due to pathophysiological reason and levels of serum cholesterol are therefore assessed in children with nephrotic syndrome. Management of nephrotic syndrome is mainly by administration of steroids. Along with steroids, supportive therapy with antihypertensives, diuretics and antibiotics is also recommended in the management of nephrotic syndrome (Kyle and Carman, 2013).

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Objective

The present study focuses on the clinical and demographic profile and management of children with nephrotic syndrome. This would provide insight into a more targeted health care policy.

METHODS

The record based descriptive study was carried out in a 200 bedded tertiary care specialty teaching hospital in Kottayam catering to the health needs of children of Kottayam, Idukki, Alappuzha, Ernakulum and Pathanamthitta districts of Kerala state. Ethical approval was obtained from the Institutional Ethics committee. Then the investigator reviewed the clinical records of 407 children with nephrotic syndrome admitted to the hospital between 2012 and 2016. The information required to satisfy the objectives like the clinical presentation, disease course, demographic characteristics and management measures was extracted from the patient files available in the

medical records at the time of data collection in 2017. The data was entered into Microsoft Excel spread sheet designed in line with the objectives and information available in the files, and analyzed using software package. Descriptive statistics was used for analysis.

RESULTS

Total number of children admitted with nephrotic syndrome during the period from 1st January 2012 to 31st December 2016 was 407. The analysis of demographic data, clinical presentation, laboratory investigations, treatment and outcome obtained from the records are presented below. Of these children 250 were boys(61.42%)[Fig1]and the age of children ranged from 1 month to 12 years.

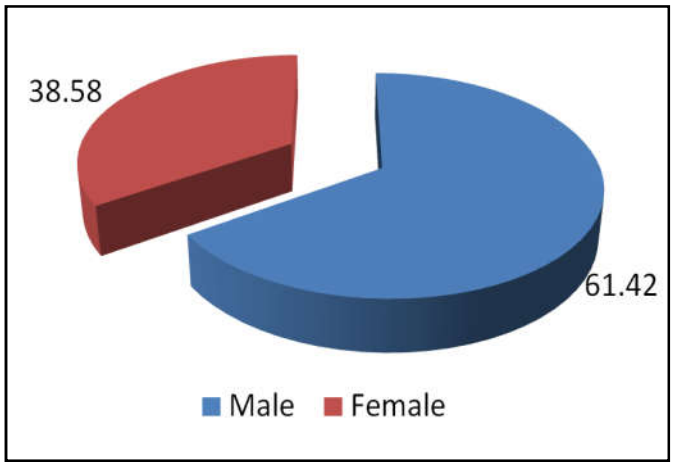

Fig. 1. Distribution of Sample Based on Gender

Table 1 shows distribution of sample according to age of onset. Nephrotic syndrome occurrence was more between 2-5 years (56.01%).

Table 1. Distribution of the sample according to age of onset of nephrotic syndrome (n=407)

Age of onset in years	Frequency	Percentage
<2	64	15.72
2-5	228	56.01
6-12	94	23.09
Not specified in files	21	05.16

Distribution of sample based on type of nephrotic syndrome is given in Table 2. Of the total admissions, major group, (65.11%) was cases of relapse, then 17.2% steroiddependent nephrotic syndrome(SDNS)followed by 15.97 % cases of first episode. Two of them were congenital nephrotic syndrome

Table 2. Distribution of Sample Based on Type of Nephrotic Syndrome (n=407)

Type of nephrotic syndrome	Frequency	Percentage
NS- first episode	65	15.97
NS- relapse	265	65.11
SDNS	70	17.20
SRND	4	0.98
FSGS	1	0.24
Congenital nephrotic syndrome	2	0.49

Along with the clinical symptom of edema, for diagnosing a case of nephrotic syndrome physicians depend on the investigations, levels of serum albumin and urine albumin. Table 3 shows that serum albumin level is between 1.5-2.5gm/dl in 66.09% of cases. Serum albumin level had decreased to less than 1.5gm/dl in 16.95cases.

Table 3. Distribution of sample based on level of serum albumin (n=407)

Serum albumin in gm/dl	Frequency	Percentage
>2.5	30	7.37
1.5- 2.5	269	66.09
<1.5	69	16.95
Not specified In chart	39	9.58

Table 4 shows the use of drugs for management of nephrotic syndrome in the study participants. Steroid administration (92.63%) is the main line of management along with administration of antihypertensives and diuretics. Physicians depend on administration of fresh frozen plasma or albumin infusion to correct hypoalbuminemia. It is evident from the files that 38% of the children received either FFP, albumin infusion singly or in combination.

Table 4. Distribution of sample based on medications used for management of nephrotic syndrome (n=407)

Medication	Frequency	Percentage
Prednisolone	377	92.63
levamisole	32	07.86
Cyclophosphamide	6	01.47
Methylprednisolone pulse therapy	3	00.73
Supportive therapy		
Antihypertensives		
Nifedipine	48	11.79
Enalapril	5	01.22
Diuretics-spironolactone+_frusemide	149	36.6
Fresh frozen plasma	85	21
Intravenous albumin	70	17

DISCUSSION

The present study aimed at describing the clinical and demographic profile and management of children admitted with Nephrotic syndrome in the tertiary care centre. Of 407 cases 250 (61.42%) were males similar to the study results by Kiron etal.[3]which supported the fact that NS is more common in males. In 56.01% children age of onset of the disease was greater in 2-5 age groups (Kyle and Carman, 2013). Nephrotic syndrome is a chronic disorder characterized by alterations in permeability of glomerular capillary wall resulting in its inability to restrict the urinary loss of protein. The serum albumin level decreases markedly as a result of massive proteinuria, and the present study showed that majority (66.06%)of children had serum albumin level between 1.5-2.5gm/dl against the normal value of 3.5-5.5gm/dl and in 16.95% cases it had decreased to less than 1.5gm /dl necessitating replacement with infusion of albumin or fresh frozen plasma (Table 3). Morethan 80% of patients with nephrotic syndrome showed minimal change disease and the remaining was contributed by FSGS and mesangio proliferative glomerulonephritis (Bagga and Mantan, 2005). The present study also showed that majority of children had minimal change disease (steroid responsive, steroid dependent or steroid resistant cases) and there were only 2 cases of congenital nephrotic syndrome and one case of focal segmental glomerulosclerosis. Management of nephrotic syndrome is mainly by administration of steroids.

Corticosteroid therapy has been used in childhood nephrotic syndrome since 1950s. Majority (90-95%) of children respond to steroid therapy[5]. In cases where steroid therapy is not effective in reaching remission, immune modulators like levamisole, cyclophosphamide and pulse methyl prednisolone are added. Same observation was obtained in the present study also. Since Nephrotic syndrome is associated with complications like infection, hypertension, convulsion, hyperlipidemia and spontaneous bacterial peritonitis. Supportive therapy is beneficial as an adjuvant to specific therapy, agents that may be needed for the management of nephrotic syndrome are diuretics, ACE inhibitors, and antibiotic therapy. Supplementation with vitamin D and calcium may be useful for patients receiving corticosteroid therapy. Present study showed that in 13% of cases antihypertensives were used. Diuretic therapy was used in 36%.

Conclusion

The children with nephrotic syndrome understudy were mainly boys and in the age group 2-5yrs.Majority of children suffered from minimal change Nephrotic Syndrome and were treated with steroids. Supportive therapy was also administered with antihypertensives, diuretics and Intravenous Albumin. The findings were similar to previous reports.

Conflict of interest: Nil

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