



Infection in children suffering from relapsing nephrotic syndrome

A K M Mamunur Rashid¹, Forrukh Ahammad², Habiba Sultana³

¹Associate Professor & Head, Department of Pediatrics, Khulna Medical College, Khulna, Bangladesh

²Assistant Professor, Department of Pediatrics, Khulna Medical College, Khulna, Bangladesh

³Assistant Registrar, Department of Pediatrics, Khulna Medical College, Khulna, Bangladesh

Abstract

Relapsing incidence of NS is 60-90%. Infection might be a contributing factor for relapse of the NS. The aim of this study is to observe the infection and type of infection as the cause of relapse of NS.

A prospective observational study was done for a period of one year. A child of 1-12 years of age of relapsing NS was included in this study. Mean age was 6.3 years. After inclusion of the cases thorough history, clinical examination and investigation were done to find out the association of infection in these cases.

Total 52 cases of relapsing NS were included in this study. Male/Female ratio was 3.3:1. 44(84.6%) children were of poor socio-economic family. Cough was the main symptom found in 22(42.3%) of relapsing NS. High total leucocyte count (TLC) was found in 16(30.5%) of patients. Among the high level of TLC the average value was 12512/cu mm. Evidence of infection was observed in 38 cases. RTI and UTI was detected in 23(44.3%) and 22(42.2%) respectively. Majority of RTI was upper respiratory tract infection (URTI).

Infection was an important contributing factor for the relapse of NS. URTI and UTI is the important cause of relapse of NS. Prompt identification and management of infection is necessary for the prevention of relapse of every case of NS

Keywords: Infection, Relapsing Nephrotic Syndrome, Children

Corresponding author: A K M Mamunur Rashid

Associate Professor & Head, Department of Pediatrics, Khulna Medical College, Khulna, Bangladesh. Email: mamunkmc@yahoo.com

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Introduction

Nephrotic Syndrome (NS) is a common renal disease in pediatric age and most (90%) with NS have a form of idiopathic NS (INS). 85% of INS is minimal change disease (MCD) and more than 95% MCD well respond to steroid therapy^{1,2}. INS is a chronic relapsing disease³. Relapse incidence of the NS is 60-90% with frequent relapse on 50-60% patients^{4,5,6}. Various factors might contribute to the relapse to the relapse of the disease^{4,7}. Among them infection might be one of the most common factors causing relapse of the NS in children⁸. So, this study was carried out to find out the type of infection as a causal factor for relapsing NS in children.

Methodology

A prospective observational study was done for a period of one

year and randomly relapsing cases of NS were included in this study. Children of 1-12 years of age that had previous diagnosis of NS admitted in the pediatric unit with relapse of the disease were included in this study. The diagnosis was made according to the criteria of International Study of Kidney Disease (ISKDC) in children. After inclusion of these cases thorough history and clinical examination were done to find out the associated infection in these cases. History and examination included cough, fever, chest infection, burning micturition, any foci of skin infection. These were recorded on the preformed questionnaire. Every case had total white blood cell with differential count, routine urine analysis and X-ray chest (posterior/anterior) P/A view. Number of cases and the type of infection was marked in relapsing NS and the results are compiled statistically.

Results

Total 52 cases of relapsing NS were enrolled in this study. Mean age of the cases are 6.3 years. Total 40 (76.9%) were male and 12(23.1%) female. Male /female ratio was 3.3:1. 44(84.6%) children were of poor and rest from middle socioeconomic family. Family history of the disease was marked in 2(3.8%) cases. Clinical features like cough, fever, chest pain, burning micturition and skin infection depicted in table 1. Total leucocyte count (TLC) was minimum of 4600/cu mm and maximum 15150/cu mm. Neutrophil was minimum of 40% and maximum of 84%. High TLC was found in 16 (30.8%) out of 52 cases. Other reports were shown in table II. Relapsing NS cases in children had respiratory tract infection (RTI) in 14 (26.9%), urinary tract infection (UTI) in 10 (19.2%), Skin infection 2(3.8%) and combined infection in 12 (23.1%). But total RTI, UTI, combined infection and skin infection was found in 23(44.2%), 22(42.3%), 12(23%) and 4(7.7%) of relapsing NS respectively. Total 38 (73.1%) out of 52 relapsing NS was associated with infection and 14 (26.9%) had no infection (Table III). Combined infection means the

cases had more than one type of infection together (RTI + UTI, UTI + Skin infection, RTI + Skin infection). Over all 23 (44.2%) had respiratory tract infection in this study as number of RTI, UTI, Skin infection cases

were found in combined infection group also. Upper respiratory tract infection was observed among 21(40.38%) and lower in 2(3.84%) cases.

Figure within the parenthesis indicate percentage.

Significant/ Non Significant	Fever	Cough	Chest Pain	Burning micturition	Skin infection	urine Pus cell	X-ray chest P/A
Significant	11(21.2)	22.(42.3)	0(0)	6(11.53)	4(7.7)	20 (38.5)	2(3.8)
Non Significant	41(78.8)	30(57.69)	52(100)	46(88.32)	48(92)	32(61.5)	50(96.2)

Figure within the parenthesis indicate percentage.

WBC count	Norma level observed no.	Low level observed no.	Minimum level	Mean level	Maximum level	Among the high level mean value
TLC	31(59.6)	5(9.6)	4600/cu mm	9954/cu mm	15150/cu mm	12512
Neutrophil	34(65.4)	6(11.5)	40%	62%	84%	77%
Lymphocyte	26(50)	10(19.2)	15%	32.34%	55%	44%

Table 2: Leucocyte count and its differential observed in cases of relapsing NS.

Figure within the parenthesis indicate percentage.

Type of Infection	Observed Infection Present no.	Observed infection absent no.	Chi square P value
Total Infection	38(73.1)	14(60.9)	.001
Total RTI	23(44.2)	29(55.8))	.405
Total UTI	22(42.3)	30(57.7))	.267
Total Combined Infection	12(23.1)	40(76.9)	.000

Table 3: Type and number of infection observed in relapsing NS in children with its statistical significance

Discussion

Male children suffer frequently from NS. Our study observed higher frequency among male children. Male/ Female ratio was 3.3:1. Relapses of the NS were found in higher rate among male children. Average age of the children suffered from relapsing NS in this study was 6.7 years which is also almost similar to other studies that had mean age of 5.2 years^{8,9}. Majority of our relapsing cases of NS were of poor socioeconomic status. This might be due to strong susceptibility of infection among the poor socioeconomic children. This observation was similar to the study by Sarker MN & et al⁴. Isolated respiratory tract infection (RTI) was found to be common (26.9%) in relapsing NS. Some had combined infection (23.1%), UTI in (19.2%), and skin infection in (3.8%). Among 22 (42.3%) respiratory tract infections, majority had upper respiratory tract infection (URTI) in this study. This observation of associated RTI in NS was similar to the study by Khemchand NM et al⁸. Other studies observed UTI was the common infection responsible for the relapse of the disease. Overall infection was the important factor causing relapse of the NS^{10,11}. Total 38 (73.07%) of relapsing NS had associated any form of infection. This infection might

be due to bacterial or viral which might trigger immunologic response for the relapse of the disease. Many studies showed the preventive role of various strategies in children with NS such as of prophylactic antibiotics, immunoglobulin replacement therapy and vaccine against streptococcal pneumonia, thymosin as immunomodulating and T cell stimulating agent, use of Chinese medical herb and zinc supplements¹²⁻¹⁶.

This study did not isolate the pathogen of infection. So, limitation of this study is that, it could not explore whether specific virus or bacterial infection was responsible for the relapse of the disease.

Infection is an important factor for relapsing NS. Among the infections, URTI and UTI is the most important cause of relapsing NS. In every case of NS care and prompt treatment must be adopted not to suffer from infection for the prevention of relapsing NS.

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