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Research Article

**STUDY TO DETERMINE THE VARIOUS TYPES OF
INFECTION IN PRIMARY NEPHROTIC SYNDROME**¹Dr Mah Rukh Tanveer, ²Dr Asma Riaz, ³Dr Zainab Khalid¹Shalamar Medical and Dental College, Lahore²Shalamar Medical and Dental College, Lahore³Shalamar Medical and Dental College, Lahore**Article Received:** October 2020 **Accepted:** November 2020 **Published:** December 2020**Abstract:****Purpose:** To determine the types of infections in primary nephrotic syndrome.**Study design:** A case series.**Place and duration of study:** In the Pediatric Department of Services Hospital, Lahore for one-year duration from November 2019 to November 2020.**Subjects and methods:** The study included 100 patients with infections in primary nephrotic syndrome admitted to both departments. Children 1-15 years old, first developing nephrotic syndrome and meeting the criteria of the International Study of Kidney Diseases of Children (ISKDC) (generalized edema, severe proteinuria > 40 mg / m² / h, Hypoalbuminemia < 2.5 gm / dL, hypercholesterolemia > 250 mg / dL) were recorded in this study. Separate proforma was completed for each patient, which included an appropriate clinical history and examination, basic research, especially for case diagnosis and screening for signs of infection.**Results:** Of the 100 patients with primary nephrotic syndrome infections, 56% were male and 44% female, most of the patients younger than 5 years of age. The most common infections in this study were acute respiratory infections and urinary tract infections, occurring in 47% and 25%, respectively. Diarrhea was responsible for 12%, skin infections 5%, peritonitis 3%, and other infections (sepsis, pulmonary tuberculosis, intestinal fever, meningitis, chickenpox) 8%. Edema was found in all patients, fever in 86 patients, cough in 47 patients, dysuria in 20, vomiting in 13, diarrhea in 12, abdominal pain in 06, skin infection in 05, dehydration in 03 and seizures in 02 patients.**Conclusion:** Respiratory tract infection and urinary tract infection were two common infections in primary nephrotic syndrome.**Key words:** primary nephrotic syndrome, acute respiratory infection, urinary tract infection**Corresponding author:****Dr. Mah Rukh Tanveer,**

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INTRODUCTION:

Nephrotic syndrome is a common kidney disease in children. According to the International Pediatric Kidney Disease Study (ISKDC), it is characterized by; generalized edema, severe proteinuria ($> 40 \text{ mg / m}^2 / \text{h}$), hypoalbuminemia ($< 2.5 \text{ gm / dl}$) and hypercholesterolemia ($> 250 \text{ mg / dl}$). In children, about 9% of admissions to hospital are due to kidney disease and the most common is nephrotic syndrome. The annual incidence of nephrotic syndrome in children ranges from 2 to 7 new cases / 100,000 children. Primary or idiopathic nephrotic syndrome is the most common form (90%) in the pediatric age group. Minimal change nephrotic syndrome (MCNS) is the most common histopathological change (80-90%) and is steroid sensitive in most children. Focal segmental glomerulosclerosis (FSGS) ranks second in 10% of cases. Infection is an important cause of morbidity and mortality in children with nephrosis, especially in developing countries. Children with nephrotic syndrome have an increased susceptibility to bacterial infections. The various infections associated with relapses are; acute respiratory infections, skin infections, diarrhea, UTIs, and primary peritonitis. Infectious complications such as peritonitis and sepsis may be responsible for 3-5% of mortality in children with nephrosis⁷. In addition, infections may be responsible for repeated relapses requiring high doses of steroids and hospitalization. Infections can also cause weak steroid response or relapse in stable remission. Many factors contribute to the increased susceptibility to bacterial infections, such as: lowered immunoglobulin levels, edema fluid acting as a culture medium, protein deficiency, hypovolemia leading to reduced spleen perfusion, loss of complement factors, immunosuppressive therapy, altered ratio of helper and suppressor T lymphocytes. Infections in nephrotic syndrome are important not only for treatment to reduce morbidity,

but also to prevent relapse and mortality. Some studies on infections in nephrotic syndrome have been conducted in Pakistan, such as types and infections in children with nephrotic syndrome. This study looked at the types of infections in pediatric primary nephrotic syndrome, as some children may only go into remission when the infection is under control.

SUBJECTS AND METHODS:

This case series was conducted in the pediatric department of Services Hospital, Lahore for one-year duration from November 2019 to November 2020. Patients 1-15 years old, first presenting with primary nephrotic syndrome and meeting the ISKDC criteria (generalized edema, abundant proteinuria $> 40 \text{ mg / m}^2 / \text{h}$, hypoalbuminemia $< 2.5 \text{ g / dl}$ and hypercholesterolemia $> 250 \text{ mg / dl}$) were included in this study. Cases with congenital and secondary nephrotic syndrome or a patient with recurrent nephrotic syndrome were excluded. A separate proforma card was completed for each patient, which included the relevant clinical history and examination and relevant laboratory tests, i.e., urine albumin test, urine protein to creatinine ratio or urine protein over 24 hours, blood count, urinalysis, serum protein and serum cholesterol level all patients. In order to detect the infection, the following tests were performed: urine culture, malaria parasite test, chest X-ray (PA view), in some cases D / R stool and blood culture, blood culture, D / R cerebrospinal fluid, culture, gram staining and skin culture swabs (if necessary).

RESULTS:

Of the 100 patients with infections in primary nephrotic syndrome, 56 were male and 44 females. Most of the cases were under 5 years of age as shown in Table 1 below.

TABLE 1: Sex and Ages of 100 Cases.

Sex and age	Male	Female
	< 5 years 30%	< 5 years 30%
	> 5 years 26%	> 5 years 14%
Total	56	44

The most common infections in this study were acute respiratory infections 47% and urinary tract infections 25%. While diarrhea 12%, skin infection 05%, peritonitis 3%, and other infections are sepsis, pulmonary tuberculosis, enteritis, meningitis and chickenpox 08%, as shown in Table 2.

TABLE 2: Types of Infections in Primary Nephrotic Syndrome

Infections	No of patients	Percentage
Acute respiratory infections	47	47
Urinary tract infection	25	25
Diarrhea	12	12
Primary peritonitis	03	03
Skin infection (cellulites, abscess)	05	05
Other infections (enteric, TB, meningitis, chicken pox sepsis)	08	08

TABLE 3: Clinical Presentation

Presentation	No of Patients
Edema	100
Fever	86
Cough	47
Dysuria	20
Vomiting	13
Diarrhea	12
Abdominal pain	06
Skin infection	05
Convulsions	02
Dehydration	03

Edema was found in all cases, fever in 86 patients, coughing in 47 patients, dysuria in 20, vomiting in 13, diarrhea in 12, abdominal pain in 06 and skin infection (cellulite, abscess) in 05 patients, dehydration in 03 and 02 patients. had convulsions as shown in Table-3.

Of the 47 cases of acute respiratory infections, the most common were lower respiratory tract infections 33 (71%), radiological changes were found in 43% of cases, streptococcal pneumonia was found in 4% of the pharyngeal cultures, and group B streptococci in 4% of upper respiratory tract infections and blood cultures were negative in all cases as shown in Table 4.

TABLE 4: Acute Respiratory Tract Infection in 47 Patients

Types of ARI	No of patients	Leukocytosis	Chest X-ray	Blood culture	Throat* culture
Acute lower respiratory infection	33(71%)	61%	43%	0%	4%
Acute upper respiratory infection	14	-	-	-	4%

Urinary tract infection was the second most frequent of 25%. The main symptoms and the isolated organism are presented in Table 5.

TABLE 5: Urinary Tract Infections in 25 Cases of Primary Nephrotic Syndrome

	No of cases	Percentage
Dysuria	20	80
Urine culture positive	25	100
ORGANISMS		
E.coli	18	73.33
Klebsella	05	20
Proteus	02	6.66

DISCUSSION:

Nephrotic syndrome is a fairly common problem in the pediatric age group. It is common in Pakistan, as in western countries. Infection is a major complication of nephrotic syndrome and is recognized as an important cause of childhood morbidity and mortality. Nephrotic syndrome in children is a state of decreased immunity, predisposing to various infections. These infections, especially peritonitis, pneumonia and sepsis, are responsible for increased morbidity and mortality in children with nephrotic syndrome. One hundred patients were enrolled in the study, the majority of patients were under 5 years of age (60%), while men were 56%, according to local reported studies. Acute respiratory tract infection was the most common (47%), comparable with the results of other studies, followed by UTI (25%). In this study, 12% diarrhea, 5% skin infections, and 3% peritonitis were reported as described in various studies. The majority of acute respiratory infections were in the form of lower respiratory tract infections (71%), and relatively more infections of the lower respiratory tract in children with nephrosis may be due to the non-localization of the infection and mechanical compression of the lung by the displaced diaphragm. Fluid stagnation in the lungs can also predispose to pneumonia. Chest X-ray indicating infection was found in 42% of patients and throat culture was positive in 4% of cases, showing streptococcal pneumonia, upper respiratory tract infection was found in 29%, and group B streptococci in 4% of cases cultured, these results are comparable with local and international research. but Iqbal et al. in their study reported 30% URTI and 27% pneumonia as the third most common infection. In our study, UTI was the second most common infection by 25%, as reported by Moorani in Karachi, but very high numbers (46% 12 and 68% 8) have been reported in various studies. Dysuria occurred in 80% of patients and urine culture was positive in all 25 patients. E. coli was grown 73% of the time, followed by Klebsiella 20%, Proteus 6% as previously reported in local, but from India, studies of E Coli 36.6%, Klebsiella 27.5% and Pseudomonas 12.5% cultures and negative have been reported 23.3%. The third most common infection was diarrhea at 12%, which is consistent with other studies in Pakistan. Skin infection was found in 5% of cases, similar to Iqbal et al. 8, but locally higher in Karachi 27%. Abscess occurred in 66% and cellulitis in 33% of patients with skin infection. All patients had leukocytosis and purulent staphylococcus aureus comparable to others. Less common peritonitis was 3%, but a very high 25.8% was reported by Senguttuvan from India and 10% locally, chicken

pox, sepsis, intestine, tuberculosis, meningitis, 1.6% respectively, in line with earlier described literature. Pulmonary tuberculosis was reported more frequently in India by 10.4%.

CONCLUSION:

Respiratory tract infection and UTI were the two most common infections (72%) in primary nephrotic syndrome.

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