

Profile of Nephrotic Syndrome Among Libyan Children in Benghazi for the Year 2016

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Abstract — Introduction: Nephrotic syndrome (NS) is a clinical picture characterized by severe proteinuria, hypoalbuminemia, edema and hypercholesterolemia.

Methods: A retrospective study was carried out to describe the disease pattern among Libyan children admitted to Benghazi children's hospital during the year 2016. The medical data was analyzed using SPSS software.

The results: Out of 105 patients with NS aged between 6 days and 15 years, 69.5% were boys and 30.5% were girls, with a mean age 4.9 ± 3.7 years. 89% of the nephrotic children had Idiopathic type. 57% of the known cases who diagnosed before as nephrotic syndrome were steroid responsive and 21% of them had frequent relapses.

Conclusion and Recommendations: Idiopathic NS was the most common type and males outnumber female patients

Further studies of childhood NS in Libya are recommended to know the exact prevalence and the incidence rate of the disease.

Keywords — Idiopathic nephrotic syndrome; proteinuria; steroid responsive; frequent relapses; Libyan children.

I. INTRODUCTION

Nephrotic syndrome, or nephrosis, is a clinical disorder characterized by heavy proteinuria, edema, hyperlipidemia, and hypoalbuminemia.^{[1],[2]}

In children proteinuria is defined as protein excretion of more than 40 mg/m²/h or a first-morning urine protein/creatinine of 2-3 mg/mg creatinine or greater.^{[2],[3]}

A- Signs and symptoms

Pitting edema is the presenting symptom in about 95% of children with nephrotic syndrome. It is typically found in the lower extremities, face and periorbital regions, scrotum or labia, and abdomen (ascites).^[2]

Other signs and symptoms of nephrotic syndrome may include the following^[2-4]:

- Respiratory tract infection - A history of a respiratory tract infection immediately preceding the onset of nephrotic syndrome is frequent
- Allergy - Approximately 30% of children with nephrotic syndrome have a history of allergy.

- Macrohematuria
- Symptoms of infection - Such as fever, lethargy, irritability, or abdominal pain due to sepsis or peritonitis
- Hypotension and signs of shock - Can be present in children presenting with sepsis
- Respiratory distress - Due to either massive ascites and thoracic compression or frank pulmonary edema, effusions, or both
- Tachypnea - To compensate for mechanical restriction to breathing
- Seizure - Due to cerebral thrombosis
- Anorexia
- Irritability
- Fatigue
- Abdominal discomfort
- Diarrhea
- Hypertension

B- Types of nephrotic syndrome

Most common in children is called **Idiopathic nephrotic syndrome**. It accounts for about 90 percent of children (The

most common type of idiopathic nephrotic syndrome is called minimal-change nephrotic syndrome (MCNS). Idiopathic nephrotic syndrome is more common in boys than girls.)^[4-6]

There is a rare nephrotic syndrome present in the first week of life called a congenital nephrotic syndrome. Congenital nephrotic syndrome is inherited by an autosomal recessive gene, which means that males and females are equally affected.^[5]

C- Diagnosis of nephrotic syndrome: ^[3-6]

- **Urine tests.** Tests to check for protein
- **Blood tests.** Tests to check the levels of cholesterol and a special blood protein called albumin
- **Renal ultrasound.** A noninvasive test in which a transducer is passed over the kidney producing sound waves which bounce off of the kidney, transmitting a picture of the organ on a video screen. The test is used to determine the size and shape of the kidney and to detect a mass, kidney stone, cyst, or other obstruction or abnormalities.
- **Renal biopsy.** A procedure where a small sample of tissue is taken from the kidney through a needle. The tissue is sent for special testing to determine the specific disease.

D- Treatment of Nephrotic syndrome: ^[4-6]

- Hospitalization
- Corticosteroids
- Immunosuppressive drug therapy
- Diuretics (to reduce the edema)
- Intravenous (IV) albumin. A blood protein that can be administered to replace the low levels

The medications used to treat nephrotic syndrome weaken the immune system so the child should not receive live vaccines.

E- Definitions of steroid response and relapse : ^{[7],[8]}

Remission – dipstick showing 0 to trace protein for 3 consecutive days.

Relapse – dipstick showing 3+ or more in 3 consecutive days.

Infrequent relapse – one relapse in 6 months or less than four per year.

Frequent relapse – two or more relapses per 6 months or more than 4 per year.

Steroid dependence – two consecutive relapses during reducing or alternate day steroids or within 14 days of cessation of steroids.

Steroid resistance – no response to steroids after 4–6 weeks of daily high-dose therapy.

F- Complications of nephrotic syndrome ^[5-8]

Complications in children result from abnormalities directly related to the nephrotic syndrome and secondarily from therapy used for its treatment. The five major complications. In children:

- Infection
- Thromboembolism
- Renal insufficiency
- Anasarca
- Hypovolemia

II. OBJECTIVES

- 1- To study the demographic characteristics and clinical presentation of Libyan nephrotic children.
- 2- To explore the clinical types of nephrotic syndrome among Libyan children.
- 3- To determine the outcome of treatment and complications among Libyan nephrotic children.

III. PATIENTS AND METHODS

Study Period : from 1-5-2017 to 31-7-2017

Study Place : Benghazi Pediatric Hospital.

Study Patients: The records of all Libyan Nephrotic children admitted to the hospital in the year 2016 were reviewed. Non Libyans were excluded from the study.

Study Type: Case series study.

Study Tool and method of data collection:

The checklist was used to collect the data from hospital records, the data was collected retrospectively. Information collected included age, sex, clinical presentations, duration of the disease, treatment, complications and outcome.

Statistical Analysis :

The data was analyzed using the program SPSS version 23.

Data were summarized by calculating the numbers and percentage, and plotted into tables and figures.

IV. RESULTS

There were 105 Libyan children diagnosed with primary Nephrotic Syndrome admitted during the year 2016 at the Benghazi Pediatric Hospital. Their age ranges from 6 days to 15 years. With a mean age (4.9 ± 3.7 years) and their median age 4 years.

TABLE 1. AGE DISTRIBUTION OF THE NEPHROTIC CHILDREN

Age (Year)	Number	Percentage
< 1	12	11%
1 -5	53	51%
6 – 10	29	28%
➤ = 11	11	10%
Total	105	100%

Table 1. shows that 62 % of Nephrotic syndrome occur among children aged less than 6 years old.

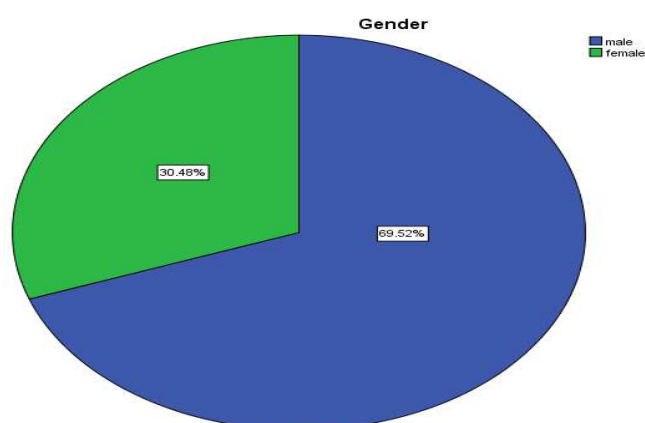


Fig. 1. Sex distribution of the nephrotic children.

The figure shows that 69.5% of the nephrotic children were male.

TABLE 2. CLINICAL PRESENTATION OF THE NEPHROTIC CHILDREN

Clinical presentation	Number (N = 105)	Percentage
Edema –Swelling	102	97%
Hypertension	63	60%
Proteinuria	89	85%
Hypoalbuminemia	71	68%
Hyperlipidemia	10	9%
Gross heamatouria	11	10%
Reduced urine	12	11%
Fatigue –poor appetite	5	4%

The table shows that edema and proteinuria were the most common clinical presentation among the nephrotic children.

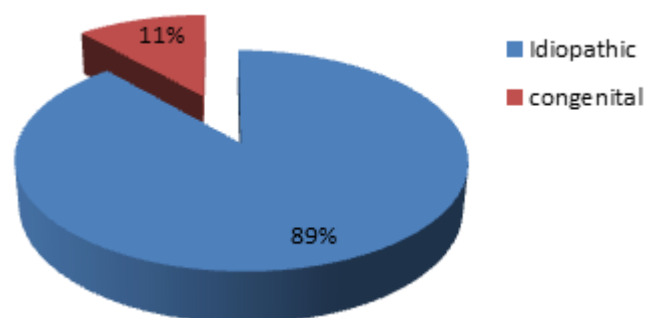


Fig. 2. Types of primary nephrotic syndrome among the Libyan children

89% of the nephrotic children had Idiopathic type.

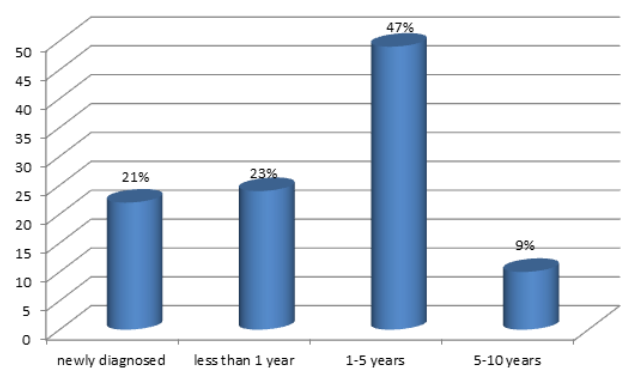


Fig. 3. Duration of Nephrotic syndrome among the Libyan children

The figure shows that 21% of the patients (22 cases) were newly diagnosed as nephrotic disease, while 83 patients were known cases of nephrotic syndrome before.

TABLE 3. OUTCOME OF THE CHILDREN (KNOWN CASES)

Outcome	Number of Known cases N = 83	Percentage
Steroid responsive	47	57%
Steroid dependent	11	13%
Frequent relapsing	17	21%
Infrequent relapsing	6	7%
Steroid resistant	2	2%

There were 83 cases diagnosed before as nephrotic syndrome ,57% of them were steroid responsive ,while 21% had frequent relapses.

TABLE 4. COMPLICATIONS OF NEPHROTIC SYNDROME AMONG THE CHILDREN

Complications	Number N = 105	Percentage
Peritonitis	28	27%
Bacteriemia	37	35%
Skin abscess	6	6%
Thrombotic complications	9	9%

The most common complications among the nephrotic children were bacteriemia (35%) followed by peritonitis (27%).

V. DISCUSSION

There were 105 Libyan children diagnosed with primary Nephrotic Syndrome admitted during the year 2016 at the Benghazi Pediatric Hospital, and only 21% were newly diagnosed nephrotic syndrome.

In our study, 69.5% were boys and 30.5% were girls, with male to female ratio 2.3:1. Other studies also found a male preponderance among young children with this disease, in a male to female ratio of 2.1:1^(9,10) Although this gender disparity disappears by adolescence, making the incidence in adolescents and adults equally among males and females⁽¹¹⁻¹⁴⁾. In this study, their age range from 6 days to 15 years with a mean age (4.9±3.7years) and their median age 4years which is similar to the Saudi Arabia study findings¹⁰.

In agreement with other studies worldwide¹⁵⁻¹⁸ 89% of the childhood nephrotic syndrome in this study was Idiopathic, while 11% was diagnosed as congenital nephrotic syndrome.

Edema-Swelling was the most common clinical presentation of nephrosis in our patients (97%); and the second most common clinical presentation was proteinuria seen in 89 patients (85%). Hypertension was seen in 60% of our patients, which is higher than what was reported in other studies^{19,20}

In our study, there were 83 child diagnosed before as nephrotic syndrome ,57% of them were steroid responsive

and 21% of them had frequent relapses. These findings are less than what reported in Saudi study¹⁰.

The most common complications of Nephrotic syndrome among our patients were bacteriemia (35%), peritonitis (27%), and thrombotic complications (9%). Skin abscesses were reported in only 6 patients (6%).

VI. CONCLUSIONS

- 1- Idiopathic nephrotic syndrome is the most common type among Libyan children.
- 2- Childhood nephrotic syndrome is more common among children less than 6 years old .
- 3- Male patients outnumber female patients.
- 4- Edema followed by proteinuria and hypoalbuminemia were the most common presentation among nephrotic children.
- 5- Most of our cases were steroid responsive.
- 6- The most common complications of Nephrotic Syndrome among our patients were bacteriemia followed by peritonitis and thrombotic complications.

VII. RECOMMENDATIONS

- 1- Regular examinations and monitoring for chronic complications are recommended to improve outcomes for children with Nephrotic syndrome.
- 2- A longitudinal and cross-sectional studies of childhood Nephrotic syndrome in Libya are recommended to know the exact prevalence and the incidence rate of the disease.

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