



STUDY OF ASSOCIATION OF NEPHROTIC SYNDROME IN CHILDREN IN RELATION TO THYROID HORMONE LEVEL (T3, T4, TSH) AND BLOOD GROUP

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ABSTRACT

Background: Nephrotic Syndrome is one of the best known presentations of paediatric kidney disease.

Aim: To study association of nephrotic syndrome in children in relation to thyroid hormone level (T3, T4, TSH) and blood group.

Material & Methods: A prospective observational study was carried out in Paediatric Department of teaching hospital in India. Study period of one and half years. All children of paediatric age group which were suspected cases of nephrotic syndrome coming to the Paediatric department both indoor and outdoor patient were evaluated for Nephrotic Syndrome based on inclusion and exclusion criteria. Data was collected using a predesigned Proforma. Participants were clinically examined thoroughly. For correlation blood grouping and thyroid hormone level (T3, T4, TSH). **Statistical analysis:** percentages and proportions were used for descriptive statistics.

Results: Total 50 cases of Nephrotic Syndrome were included in the study. Majority of cases were in the age group of 2 to 8 years (84%). More males were affected than female. Sex ratio was 2:1. Most common type of Nephrotic Syndrome was primary one observed in 90% of the cases. Most common presenting feature was facial edema (82%) followed by Cough (70%) and fever (60%). Hematuria was observed in 4 patients. In the present study in nephrotic cases were having low serum thyroid hormone T3 and T4 level in 15 cases (30%) this may be due to loss of thyroid binding globulin but TSH was raised in 16 patients i.e 32% of patients. Majority patients had O Positive blood group (34%) followed by B Positive blood group (24%) and A Positive blood group (18%).

Conclusion: In the present study in one third of nephrotic syndrome cases were having low serum thyroid hormone T3 and T4 level. TSH was raised in one third of the cases. Majority patients had O Positive blood group.

KEYWORDS : Nephrotic Syndrome, Paediatric, Correlation, Thyroid Hormones, Blood Group

INTRODUCTION:

Nephrotic syndrome is characterized by heavy proteinuria, hypoalbuminemia (serum albumin <2.5 g/dl), hyperlipidemia (serum cholesterol >200 mg/dl) and edema [1]. Nephrotic syndrome in children is mostly minimal change nephrotic syndrome. Nephrotic syndrome with significant lesions affects older children. Nephrotic syndrome can also be defined as, manifestation of glomerular disease, characterized by nephrotic range proteinuria and a triad of clinical findings associated with large urinary losses of protein: hypoalbuminemia, edema and hyperlipidemia [2]. Nephrotic Syndrome is one of the best known presentation of paediatric kidney disease. It has an incidence of three cases per 1,00,000 each year [3]. The incidence of Nephrotic Syndrome worldwide in children is estimated to be 2-16.9 per 100000.[4] The highest incidence found in children from Asian descent. Nephrotic syndrome is seen more often in African and African- American children than in Caucasians. [5] Male preponderance which tends to be unexplained is observed, with male to female ratio's ranging from 1.5-3 .Typically in the first decade Of life Childhood nephrotic syndrome presents ; the average reported age at onset is 3.5-5.5 years.[6,7] In Indian scenario, also incidence is in western countries. Patients with nephrotic syndrome have a variable thyroid hormone profile. Although total T4 and T3 may be low secondary to urine loss of thyroxine-binding globulin, serum levels of free thyroxine (FT4) and thyroid-stimulating hormone (TSH) are usually normal, so patients are considered to be euthyroid (8).

The present study was conducted with an aim to study association of nephrotic syndrome in children in relation to thyroid hormone level (T3, T4, TSH) and blood group.

MATERIAL AND METHODS:

This was a prospective observational study, conducted in department of paediatric in teaching hospital in India over a period of 18 month. All children of paediatric age suspected cases of nephrotic syndrome coming to the Paediatric department both indoor and outdoor patient were evaluated for nephrotic syndrome.

Those patients whose

- Urinary albumin was <or =2.5g/dl,
- Proteinuria more than 3+
- Hypercholesterolemia >200mg/dl
- Spot protein creatinine ratio >2mg/mg were classified as nephrotic

Selection of cases was based on the following criteria

Inclusion criteria -

1. Newly Suspected cases of Nephrotic syndrome in children.
2. Patients who are not on any immunosuppressive drug therapy.
3. Children with no gross urogenital anomalies.
4. Nephrotic syndrome not associated with any chronic disease

EXCLUSION CRITERIA-

All those clinically suspected cases of Nephrotic syndrome whose diagnosis is not clinico-pathologically consistent with nephrotic syndrome.

Study Tool:

Data was collected using a predesigned Proforma. Participants were examined thoroughly. Thorough clinical examination findings of subjects of study was recorded in a printed proforma. It included detailed history, history of immunisation, clinical history, detailed clinical examination with measurement of blood pressure by auscultatory method and anthropometric measurements. Laboratory investigations included blood examination, urine examination and any special investigation if required. For correlation blood grouping and thyroid hormone level (T3, T4, TSH) was done

STATISTICAL ANALYSIS:

Demographic details were mentioned as proportion and percentages. For thyroid hormone and blood group percentage were also calculated.

Ethical considerations:

The study was approved by the Institutional Ethics Committee. The study was conducted according to the Declaration of Helsinki. A written informed consent was taken from all parents / guardians of the child after explaining the purpose and study and resolving their queries if any.

RESULTS:

The study was conducted in tertiary care centre. 50 cases of nephrotic syndrome were studied during the study period. Majority of cases of nephrotic syndrome were in the age group of 2 to 8 years (n=42) 84% In this study more males were affected than female. Sex ratio was 2:1 Most common type was primary (90%) followed by secondary to infection (4%)

Most common presenting feature was facial edema (82%). Most patients of facial edema, the Periorbital edema was most common. 8% has edema of legs and 5% cases had generalised edema.

Cough (70%) and fever (60%) were common clinical presentation. While other clinical presentations were weight gain (30%), loss appetite (36%) and increased frequency of micturition (30%).

The patients presenting with haematuria were less. Only 4 patients out of 50 were presented with haematuria.

Table No. 1- Serum thyroid hormone T3 tri- ido-thyronine and T4 thyroxin in association to Nephrotic Syndrome cases.

Cases	Raised	Decreased	Normal
Number	1	15	34
Percentage(%)	2%	30	68

The thyroid hormone T3 (tri- iodothyronine) and T4 (thyroxin) were decreased in case of nephrotic syndrome, this is due to loss of thyroid binding globulin.

Table No.2- Showing Serum TSH level in nephrotic syndrome cases.

TSH level	Raised	Normal
Counts	16	34
Percentage(%)	32%	68%

TSH level were either increased or is normal in nephrotic syndrome.

Table No. 3- Blood Group A in relation to Nephrotic Syndrome cases.

Blood Group	A Positive	A negative
Cases	9	3
Percentage	18%	6%

Table No.4 - Blood Group O in relation to Nephrotic Syndrome cases.

Blood Group	O positive	O Negative
Cases	17	2
Percentage	34%	4%

Table No. 5- Blood Group B in relation to Nephrotic Syndrome cases.

Blood Group	B Positive	B Negative
Cases	12	7
Percentage	24%	14%

There were no cases of AB blood group

DISCUSSION:

Nephrotic syndrome is one of the most common Paediatric renal disorders. Heavy proteinuria, clinically manifesting as the nephrotic syndrome, is almost always due to primary renal involvement in childhood.

In the present study the incidence of nephrotic was found out, which was 50 cases, during the period of study. Mostly in 2 to 8 years of age, mean 4.7 year. In the present study the male to female ratio was 2:1 (2.1:1). In the present study following clinical presentations were observed. 30(60%) presented with fever, 15(30%) Presented with weight gain, 35(70%) Presented with cough, 18(36%) Presented with loss of appetite, 15(30%) Frequency of Micturation, 2 (4%) Loose Motion , 1 (2%) Itching. Cough is most common complaint, showing upper respiratory tract infection been most common.

In the present study TSH was raised in 16 cases (32%) of cases. Nephrotic syndrome cases were having low serum thyroid hormone T3 and T4 level in 15 cases (30%) this may be due to loss of thyroid binding globulin. Primarily due to loss of protein in the urine, Nephrotic syndrome is accompanied by changes in the concentrations of TH. Acute kidney injury and chronic kidney disease are accompanied by notable effects on the hypothalamus-pituitary-thyroid axis. Data from a recent research suggested that thyroid hormone, T3 especially, can be considered as a marker for survival in patients with kidney disease [9]. Gilles et al. reported that abnormalities in thyroid function are seen in patients with proteinuria. TSH levels specifically were higher in patients with proteinuric renal diseases. Subclinical hypothyroidism occurred more frequently in the nephrotic syndrome

patients [10]. Adlkofer et al. examined the thyroid function of patients with proteinuria and found T3 and T4 was much higher in them.[11] Feinstein et al. showed that the reduced serum levels of T4 and T3 in these patients may be due to decreased binding to and/or concentration of serum carrier proteins, and, as in acute renal failure and chronic renal failure, patients with nephrotic syndrome with normal renal function have normal total and increased free rT3 values in association with reduced TT3 levels [12].

Relation with blood group system helps us in better diagnosis of the disease. Present study didn't find any association between Nephrotic syndrome and ABO blood group and Rh factor. No studies have been so far conducted on blood group in association with nephrotic syndrome.

CONCLUSION:

In the present study in one third of nephrotic syndrome cases were having low serum thyroid hormone T3 and T4 level. TSH was raised in one third of the cases. Majority patients had O Positive blood group.

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