International Journal of Medical and Health Research
ISSN: 2454-9142
www.medicalsciencejournal.com
Volume 4; Issue 6; June 2018; Page No. 127-129

Comparative evaluation of serum lipids & proteins in children's suffered from nephrotic syndrome

Dr. BP Jaiswal[1], Dr. MD Athar Ansari[2*]

[1] Associate Professor, Department of Pediatrics, Nalanda Medical College and Hospital, Patna, Bihar, India

[2] Assistant Professor, Department of Pediatrics, Nalanda Medical College and Hospital, Patna, Bihar, India

Abstract

Lipoproteins play an important role in the transport of plasma lipids; their increase or alteration in various fractions may be responsible for hypercholesterolemia, in nephrotic syndrome. The present study is designed to study the derangement of serum lipids in nephrotic syndrome and to know whether any correlation exists between serum lipids and albumin

The study has planned in Nalanda Medical College and Hospital. This is a Cross sectional study in which 25 Normal patients and 25 patients with nephrotic syndrome aged 15 years and below. The Group A includes 25 Normal patients and Group B patients includes 25 Nephrotic syndrome patients.

From the present study it can be concluded that in nephrotic syndrome, there is generalized hyperlipidemia and hypoalbuminemia. Although hyperlipidemia is most marked when serum albumin is low, yet no definite correlation can be established between the degree of hypoalbuminemia and rise of lipids. Hyperlipidemia of the nephrotic syndrome may be related to the progression of glomerulosclerosis through an increasingly vast array of lipid mediators affecting inflammation, glomerular blood flow and fibrosis.

Keywords: cholesterol, lipoprotein, nephrotic syndrome

Introduction

Nephrotic syndrome is a collection of symptoms due to kidney damage. This includes protein in the urine, low blood albumin levels, high blood lipids, and significant swelling. Other symptoms may include weight gain, feeling tired, and foamy urine. Complications may include blood clots, infections, and high blood pressure.

Childhood nephrotic syndrome is not a disease in itself; rather, it is a group of symptoms that indicate kidney damage—particularly damage to the glomeruli, the tiny units within the kidney where blood is filtered result in the release of too much protein from the body into the urine When the kidneys are damaged, the protein albumin, normally found in the blood, will leak into the urine. Proteins are large, complex molecules that perform a number of important functions in the body [1].

A health care provider may refer a child with nephrotic syndrome to a nephrologist—a doctor who specializes in treating kidney disease. A child should see a pediatric nephrologist, who has special training to take care of kidney problems in children, if possible. However, in many parts of the country, pediatric nephrologists are in short supply, so the child may need to travel. If traveling is not possible, some nephrologists who treat adults can also treat children [1].

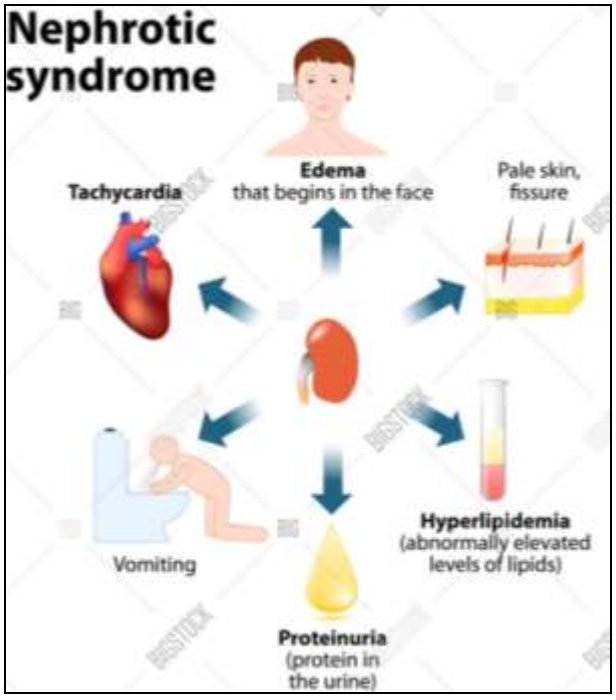

Fig 1

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).

Some degree of correlation between lipids and serum albumin as suggested by Thomas *et al* and between lipidemia and edema by peters *et al* generally, when edema regress. Lipid level fall but in some cases, it may continue to persist even after the edema has disappeared. Hyperlipidemia usually observed during the active phase of the disease and disappears with resolution of proteinuria. Hyperlipidemia may contribute to renal injury and Experimental studies demonstrated that reduction of plasma lipids level slow progression of Glomerular and Tubulointerstitial disease [3, 4].

Hyperlipidemia is usually observed during the active phase of the disease and disappears with resolution of proteinuria. However, it may persist in some cases, leading to increased risk of atherosclerosis in later life. Hence, close monitoring of lipid levels during remission of nephrotic syndrome is necessary to select high-risk patients.

Lipoproteins play an important role in the transport of plasma lipids; their increase or alteration in various fractions may be responsible for hypercholesterolemia, in nephrotic syndrome. There is increased total cholesterol, LDL cholesterol, and VLDL cholesterol and triglycerides and normal or low HDL cholesterol6.

However, in Indian children, the degree of hyperlipidemia is not high as in western children [5, 7]. More recently it has been expressed that hyperlipidemia may contribute to renal injury [8]. And experimental studies demonstrated that reduction of plasma lipid levels slows progression of glomerular and Tubulointerstitial disease [9]. A great deal of evidence is now available to show that the incidence of Nephrotic Syndrome varies from place to place due to changes in food habits, climate, type of work and ethnic origin. It has also been noted that certain factors like diet, malnutrition, genetic traits etc., are known to alter the frequency and severity of lipid pattern. The Indian patient has a different dietary, constitutional and genetic background.

Hyperlipidemia has been recognized as a common finding in nephrotic patients since 1917, when hypercholesterolemia was described as a feature of nephrotic syndrome. Although pathophysiological aspects of hyperlipidemia have not been completely identified, hypoalbuminemia, increased lipoprotein synthesis and decreased lipoprotein lipase activity are described by various workers. Lipoproteins play an important role in the transport of plasma lipids; their increase or alteration in various fractions may be responsible for hypercholesterolemia, in nephrotic syndrome. There is increased total cholesterol, LDL cholesterol, VLDL cholesterol and triglycerides and normal or low HDL cholesterol. However, in Indian children, the degree of hyperlipidemia is not high as in western children [. More recently it has been expressed that hyperlipidemia may contribute to renal injury.

The present study is designed to study the derangement of serum lipids in nephrotic syndrome and to know whether any correlation exists between serum lipids and albumin

Materials and Methods

The study has planned in Nalanda Medical College and Hospital. This is a Cross sectional study in which 25Normal patients and 25patientswith nephrotic syndrome aged 15 years and below. The patients visited to Out Patient Department (OPD) and in-patient department (IPD) of NMCH were considered in the study. All the patients are informed consents. The entire patient's clinical history was collected. The Group A includes 25 Normal patients and Group B patients includes 25 Nephrotic syndrome patients.

A diagnosis of nephrotic syndrome was confirmed in patients in the presence of the followings.

- Massive proteinuria
- Hypoalbuminemia
- Oedema
- Hypercholesterolaemia

Inclusion Criteria: All infants and children between 0-15 years of age suffering from nephrotic syndrome.

Exclusion Criteria:

- Children with liver disorders.
- Children with oedema due to Kwashiorkor
- Children with oedema due to CCF
- Children suffering from kidney diseases other than nephrotic syndrome.

The samples were analysed for Protein profile (Serum Total protein, serum albumin, serum globulin, A: Gratio, urinary proteins, Blood urea & serum creatinine), Lipid Profile(Total cholesterol, HDL-C, LDLC,VLDL, Non-HDLC, serum phospholipids and triglycerides).

Results & Discussion

The data from the 25 nephrotic patients were collected and compared with the 25 normal patients. The data were summarized and presented as below.

Table 1: Observed Serum Levels of Lipid Profile

	Group A: Normal patients	Group B: Nephrotic syndrome patients
Total Cholesterol	150-210 mg/dl	290-530 mg/dl
High Density Lipids	41-53 mg/dl	42-56 mg/dl
Low Density Lipids	100-140 mg/dl	250-340 mg/dl
Very Low Density Lipid	40-50 mg/dl	45-59 mg/dl
Triglycerides	79-110 mg/dl	263-295 mg/dl

Table 2: Observed Serum Levels of Serum Proteins

	Group A: Normal patients	Group B: Nephrotic syndrome patients
Serum Total Protein	6.9-7.8 g/dl	3.4-4.3g/dl
Serum Albumin	3.9-4.4g/dl	1.6-2.1g/dl
Serum Globulin	3.15-3.50g/dl	2.1-2.45g/dl

We had observed that the very significant rise in the serum cholesterol, HDL, LDS, VLDL & Triglycerides in the Nephrotic syndrome patients as compared to Normal patients.

Arije *et al* also observed persistent rise in serum lipids in frequent relapse cases [11]. Milne reported that the total cholesterol in nephrotic syndrome may be higher than 1000 mg% [12]. we observed low serum lipids in Indian children.

In our study, we observed an inverse correlation between albumin and cholesterol. When albumin was too low, the serum cholesterol was very high and vice versa. Heymann *et al*, found no correlation between the developmental of hyperlipidemia and hypoalbuminemia and postulated that the severity of hyperlipidemia is related to the amount of nephrotic kidney tissue present [13]. Thomas *et al* found correlation between serum cholesterol and albumin and did not find correlation between serum cholesterol and globulin and total protein [14-15]. Friedman and Byers postulated that hypoalbuminemia causes hyperlipidemia [16].

From the present study it can be concluded that in nephrotic syndrome, there is generalized hyperlipidemia and hypoalbuminemia. Although hyperlipidemia is most marked when serum albumin is low, yet no definite correlation can be established between the degree of hypoalbuminemia and rise of lipids. Hyperlipidemia of the nephrotic syndrome may be related to the progression of glomerulosclerosis throughan increasingly vast array of lipid mediators affecting inflammation, glomerular blood flow and fibrosis.

References

1. http://www.niddk.nih.gov/health-information/health-topics/kidney-isease/nephrotic-syndrome-in-children/Pages/index.aspx
2. http://emedicine.medscape.com/article/982920-overview.
3. JP Peters, EB Man. The inter relationship of Serum lipids in patients with diseases of kidneys, J Clin Invest. 1943; 22:721.
4. Bhandari, Mandowara. Lipoprotein profie in nephrotic syndrome. Indian Paediatrics. 1980; 17:416-9.
5. Banerjee SK, Sarkar AK, Chugh KS, Bansal VK, Chhuttani PN. Serum lipids innephroticsyndrome. JAPI. 1982; 71:651-57.
6. David CW, Bernard DB. Lipid abnormalities in the nephrotic syndrome Am JKidney Dis. 1994; 23(3):331-46.
7. Benakappa DG, SubbaRao A, Sastry NSC. Low density lipoprotein levels inchildrenwith nephrotic syndrome. Indian pediatrics. 1976; 13(4):287-89.
8. Moorhead JF, Chan MK, Nahas AM, Varghese Z. Lipid nephrotoxicity in chronic progressive glomerular and tubulo interstitial disease. Lancet. 1982; 2:1309-11.
9. Keane WF, Peter JV, Kasiske BL, Kim Y. The role of altered lipid metabolism in the progression of renal disease. Am J Kidney Dis. 1991; 17:38-42.
10. http://iosrjournals.org/iosr-jdms/papers/Vol13-issue3/Version-1/A013310106.pdf
11. A Arije, RT Erasmus, SA Anjorin, Plasma lipids. lipoproteins cholesterol distributions in nephrotic syndrome patients during short term steroid treatment. Cent Afr J Med. 1993; 39(10):211-5.
12. M Milne. Biochemical disorders in human disease (2nd ed. London: Churchill Ltd, 1976.
13. W Heymann, LW Mathews. Studies on the casual role of hypoabluminemia in experimental nephrosis. J Clin Invest. 1958; 37:808.
14. EM Thomas, AH Rosenblum, HB Lander, R Fisher. Relationship between blood lipid and blood protein levels in nephrotic syndrome, Amer J Dis. Child. 1951; 81:207.
15. Mahmud S, Jahan S, Hossain MM. Hyperlipidemia in childhood idiopathic nephritic syndrome during initial remission and relapse. Mymensingh Med J. 2011; 20:402.
16. M Friedman, Roseman Byers. Hyperlipidemia in nephrotic syndrome. J Clin Invest. 1954; 33:1103.