

A COMPARATIVE STUDY OF LIPID PROFILE IN FIRST ATTACK VERSUS RELAPSE CASES OF IDIOPATHIC NEPHROTIC SYNDROME IN CHILDREN

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Abstract:

Introduction: Nephrotic dyslipoproteinemia usually reverts to normal with remission but hyperlipidemia is a well known risk factor for atherosclerosis and glomerular injury in children. There are few studies comparing the spectrum of dyslipidemia in initial attack and subsequent relapses of nephrotic syndrome.

Aims and Objectives: The aim of the study was to compare the lipid profile in first attack and relapse cases of idiopathic nephrotic syndrome in children.

Materials and Methods: This is multicentric, prospective study conducted between December 2016 and May 2018. 35 cases of idiopathic nephrotic syndrome aged 1 to 15 years were included in the study. Out of 35 cases, 20 cases were in first attack and 15 cases were in relapse group. Magnitude of hyperlipidemia, lipid profile, and albumin were collected and analyzed in the study.

Results: Total serum cholesterol levels (470+120) mg/dl was higher in relapse cases as compared to first attack group. Similarly VLDL (50+26) mg/dl, LDL (351+120) mg/dl, serum TG (305+110) mg/dl were higher in relapse cases. However serum HDL (41+8) mg/dl was found to be lower in relapse group as compared to first attack. The serum albumin level (<2.5 g/dl) was low in all cases, but in 20% (n = 3) of relapse group was very low (<1.0 g/dl).

Conclusion: This establishes higher serum cholesterol, LDL, VLDL, TG and marginally lower HDL in relapse group compared to first attack which may be explained by lower serum albumin level causing higher lipid profile. In all relapse cases, close monitoring of lipid profile in early intervention is essential.

Keywords: Idiopathic nephrotic syndrome, dyslipidemia, relapse, lipid profile, VLDL.

Introduction:

Nephrotic syndrome is a disease of children characterized by heavy proteinuria, hypoalbuminemia, hyperlipidemia and edema. Most pronounced secondary changes in children with nephrotic syndrome is lipoprotein metabolism which are qualitative and quantitative.¹

VLDL and LDL are elevated in nephrotic syndrome while HDL is reported to be unchanged or reduced.² The severity of

hyperlipidemia tends to correlate with severity of hypoalbuminemia.^{3,4} But recent studies show that nephrotic syndrome may have prolonged periods of hyperlipidemia even after clinical remission,⁵ persistence and severity of lipid changes correlating well with duration of disease & frequency of relapses.

There are two potential risks of elevated plasma lipids: atherosclerosis and accelerated progression of glomerular injury

by favouring mesangial sclerosis leading to progression of renal disease.⁶

This study is conducted with the aim to compare lipid profile in first attack and relapse cases of idiopathic nephrotic syndrome in children.

Materials and Methods:

This study is multicentric study conducted between December 2016 and May 2018. 35 children of age group ranged from 1 to 15 years having first attack and relapse of idiopathic nephrotic syndrome were included in the study. Out of 35 cases, 20 cases were having first attack of idiopathic nephrotic syndrome and 15 cases were having relapse of idiopathic nephrotic syndrome. All the children were admitted in pediatric department and in fasting state blood collection was done in early morning. Demographic data, lipid profile, magnitude of hyperlipidemia and serum albumin were analyzed. Diagnosis of nephrotic syndrome was based on the guidelines of Indian pediatric nephrology group.⁷

Results:

Out of 20 cases of first attack group, 12 were males and 8 cases female children. In the relapse group, out of 15 cases, 9 cases were males and 6 cases were female children. Majority of children in each group were between 1 and 5 years.

Total serum cholesterol levels (470+120) mg/dl was higher in relapse cases as compared to first attack group. Similarly VLDL (50+26) mg/dl, LDL (351+120) mg/dl, serum TG (305+110) mg/dl were higher in relapse cases. However serum HDL (41+8) mg/dl was found to be lower in relapse group as compared to first attack. The serum albumin level (<2.5 g/dl) was low in all cases, but in 20% (n = 3) of relapse group was very low (<1.0 g/dl).

Discussion:

Out of 35 children with nephrotic syndrome majority were between 1 to 5 years of age. In the first attack group, 12 were males and 8 cases were female children, as compared to 9 males and 6 female children in relapse group. So a

male preponderance was noticed in first attack and relapse group.⁸

Heyman et al (1972), Srivastav et al (1975)⁹ has reported as 2:1 male to female ratio, comparison of complete lipid profile in the first attack and relapse cases showed that total serum cholesterol level mean (470+120) mg/dl was higher in relapse cases as compared to first attack group.¹⁰ Mahmud S, Jahan (2011) and Arije et al¹¹ also observed persistent rise in serum cholesterol in frequent relapse cases. Similarly serum TG (305+110) mg/dl, LDL (354+120) mg/dl, VLDL (59+26) mg/dl levels were also high in relapse cases.¹² Dnyanesh DK, Suma Dnyanesh (2014) had similar observations in their study. However serum HDL (41+8) mg/dl was found to be lower in relapse group as compared to first attack.¹ Merouani et al observed hyperlipidemia during the active phase of the disease and disappears with resolution of proteinuria and was persistently normal in frequently relapse children.¹⁰ Mahmud S et al concluded that serum cholesterol may be regarded as predictor of relapse in childhood idiopathic nephrotic syndrome.

The higher level of lipid profile in relapse compared to first attack is explained by -

1. Marked and ongoing damage to glomeruli by previous hyperlipidemia as suggested by previous studies.¹³
2. Lipid level may remain high even during remissions as suggested by various studies.¹⁴ Any relapse during this period is therefore likely to increase the lipid level further as suggested. There is increased suppressor T cell activity during relapse as suggested by Eljouki AY,¹⁵ also low level of IgG as suggested by Meadou et al.¹⁶ Therefore there is increased chance of infection and further likely deminution of serum protein level resulting in hyperlipidemia. Comparing the serum albumin level in first attack versus relapse group, it was lower in relapse than in first attack group. White et al¹⁷ and Srivastava et al¹⁸ report a similar incidence of hypoalbuminemia. Thus this study is consistent with other studies.

Conclusion:

This establishes a higher serum cholesterol, LDL, VLDL, TG and marginally lower HDL level in relapse group as compared to first attack which may be explained by lower

serum albumin level causing high lipid profile. Thus, a combination of increased hepatic synthesis and decreased removal of lipoproteins from plasma is thought to be present in nephrotic syndrome. This emphasizes the need of close monitoring of lipid profile and in all further episodes of relapse group for dietary modification and early medical intervention to prevent long term cardiovascular morbidity and progression of renal disease.

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