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A Study of Lipid Profile and CRP in Children with Nephrotic Syndrome.

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ABSTRACT

Background: Nephrotic syndrome (NS) is more common in children in comparison of adults. Dyslipidaemia is considered one of the common findings of nephritic syndrome. C reactive protein (CRP) is considered one of the important marker of inflammation as well as cardiovascular disease. Therefore the present study was designed to assess if there is any relation between lipid profile, CRP and nephorotic syndrome. **Methods:** Present study included thirty (30) children suffering from nephritic syndrome and thirty (30) healthy children as from pediatric wards of Rajshree Medical Research Institute, Bareilly. All children with nephrotic syndrome and control group were between 2-12 years of age. Serum cholesterol level (normal range 150-200 mg/dl), triglycerides (normal range 60-165 mg/dl) and serum VLDL were measured by Enzymatic colorometric method. Whereas HDL (normal range 30-70 mg/dl) was measured by Phosphotungstate method. Serum LDL was calculated by Friedewald"s equation. Serum Albumin (normal range 3.5-5 gm/dl) was measured by Photometric method. CRP was estimated by enzyme linked immune assay (ELISA) method. **Results:** TC ($p<0.01$), LDL ($p<0.01$) and TG ($p<0.01$) were significantly high in patients of nephrotic syndrome in comparison of control children. Further, HDL ($p<0.01$) was significantly low in nephrotic syndrome group in comparison of control group. Tthere was an insignificant difference in VLDL of both groups. There was an insignificant difference in CRP ($p<0.07$) of both groups. **Conclusion:** Findings of the current study suggest that dyslipidaemia is associated with nephritis syndrome. This high level of lipoprotein can lead to future cardiovascular diseases in nephrotic syndrome patients. Although, CRP level which is a strong predicator of CVD is normal; nevertheless, risk of future CVD cannot be ruled out. However, more studies on large populations are required to establish a relation between lipid profile, CRP and nephrotic syndrome.

Keywords: Nephrotic syndrome, dyslipidaemia, CRP, CVD.

INTRODUCTION

Nephrotic syndrome (NS) is more common in children in comparison of adults.[1] Nephrotic syndrome is manifestation of glomerular disorder which is characterized by profuse proteinuria the, edema, hypoalbuminemia and hyperlipidaemia.[2,3] Dyslipidaemia is considered one of the common findings of nephritic syndrome.[4] An essential role has been played by lipoproteins in transport of plasma lipids.[5]

Various studies suggested low serum albumin level induces synthesis of lipoprotein and decreases brake down of lipids.[6,7] Although, hyperlipidaemia is more severe in children of western countries compare to Indian children.[8,9] Dyslipidaemia may leads to renal injury along with increased risk of atherosclerosis and cardiovascular diseases. 10 C reactive protein (CRP) is considered one of the important marker of inflammation as well as cardiovascular disease (CVD).[11]

Therefore the present study was designed to assess if there is any relation between lipid profile, CRP and nephorotic syndrome.

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MATERIALS AND METHODS

The present study was a cross section type of study which was approved from the ethical committee of Rajshree Medical Research Institute, Bareilly. Present study included thirty (30) children suffering from nephritic syndrome and thirty healthy children as from pediatric wards of Rajshree Medical Research Institute, Bareilly. All children with nephrotic syndrome and control group were between 2-12 years of age. Children having any type of liver disorders, oedema due to Kwashiorkor or congestive cardiac failure were excluded from the study. The Nephrotic cases were selected according to criteria proposed by International study of kidney disease in children that is children with edema, proteinuria

(more than 3 gm in 24 h/1.73m2), hypoproteinemia (serum albumin less than 2.5 gm/dl, hyperlipedemia.

Methodology

Serum cholesterol level (normal range 150-200 mg/dl), triglycerides (normal range 60-165 mg/dl) and serum VLDL were measured by Enzymatic colorometric method. Whereas HDL (normal range 30-70 mg/dl) was measured by Phosphotungstate method. Serum LDL was calculated by Friedewald"s equation. Serum Albumin (normal range 3.5-5 gm/dl) was measured by Photometric method. CRP was estimated by enzyme linked immune assay (ELISA) method.

Statistical analysis

Results of the present were analyzed by using spss v21 manufactured by USA. Paired students t test was used to assess if there is any significant difference between lipoproteins and CRP of nephrotic syndrome group and control group. A p value <0.05 was considered as statistically significant.

RESULTS

Table 1: Comparison of lipid profile in both groups.

	Group I (NS Patients)	Group II (Control)	p value
Total Cholesterol (mg/dl)	328±35.6	189.6±28.6	<0.01*
High Density Lipids (mg/dl)	25.6±8	46.4±6.4	<0.01*
Low Density Lipids (mg/dl)	266.8±31.4	125.6±18.5	<0.01*
Very Low Density Lipid (mg/dl)	42.4±7.6	41±6	<0.06NS
Triglycerides (mg/dl)	178±20	87.8±13	<0.01*

*= significant, NS= non significant.

Table 2: Comparison of different types of protein in both groups.

	Group I Patients	Group II Normal	p value
Serum Total Protein(g/dl)	3.65±0.48	7.2±0.4	<0.01*
Serum Albumin(g/dl)	1.7±0.26	4.10±0.3	<0.01*
Serum Globulin(g/dl)	2.29±0.24	3.30±0.25	<0.01*

*= significant

All the results of the present study have been expressed as mean±SD. [Table 1] shows that TC (p<0.01), LDL (p<0.01) and TG (p<0.01) were significantly high in patients of nephrotic syndrome in comparison of control children. Further, HDL (p<0.01) was significantly low in nephrotic syndrome group in comparison of control group. However, there was an insignificant difference in VLDL of both groups.

[Table 2] shows that serum total protein (3.65±0.48 g/dl vs 7.2±0.4 g/dl, p<0.01), serum albumin (1.7±0.26 g/dl vs 4.10±0.3 g/dl, p<0.01) and serum globulin (2.29±0.24 g/dl vs 3.30±0.25 g/dl, p<0.01) were significantly low in nephrotic syndrome patients compare to control group. It is evident from figure 1 that there was an insignificant difference in CRP (p<0.07) of both groups.

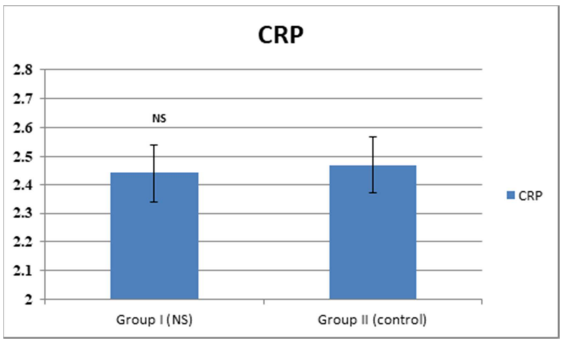

Figure 1: Comparison of CRP in both groups.

NS = non significabnt.

DISCUSSION

Dyslipidaemia is one of the foremost causes of CVD.[5] Hyperlipidaemia has been found associated with hypertension as well as CVD.[12] Findings of the present study have shown that TC, TG and LDL were significantly high in NS children compare to control group. These findings are consistent with the findings of previous studies of Krishnaswany D etal,[13] Appel GB et al and Alexander JH et al as they recorded significantly high level of these lipoproteins in their studies. This high level of TC,[14,15] TG and LDL in NS children may be due to decrease of protein in body during nephrotic syndrome as hypoproteinemia induces protein synthesis in liver which may leads to hyperlipidaemia.[16] NS causes increase of LDL due to higher protein receptors and increased mRNA receptors along with enhanced gene translation rate.[17] This increased level of LDL may leads to impairment of endothelium which may result in loss of dilating ability of arteries. This derangement of endothelium function causes hypertension.[12]

Apart from this findings of the current studies have shown that HDL was significantly low in NS group in comparison of control group which is very similar to the previous study of Adekoya A.O et al,[18] This low level of HDL in NS group may be due to high level of LDL leads decrease of HDL due to lipid peroxydation.[17] Further, it has been suggested that dyslipidaemia and proteinuria are related with NS as oncotic pressure is decreased due to hypoalbuminemia results in increases synthesis of protein from the liver.[19] Furthermore, lippoprotein catabolism can be affected by NS as this increased

level of lipids may increase the catabolism of lippoprotein in kidney.[20]

Higher level of lipporprotein induces various inflammatory processes along with arterial inflammation.[21] In addition, higher lipoprotein besides various inflammatory pathways may lead to atherosclerosis.[22]

CRP is abundantly produced by hepatocytes in acute response, on stimulation various inflammatory markers life IL6, tumor necrosis factor etc.[23] CRP level may be analogous to lipids level in predicting the short term and long term cardiovascular outcomes. Moreover CRP is considered as strong predicator of CVD.[24] However, there was an insignificant difference in CRP level in both groups. Which is similar to the previous study of Shostak E et al,[25] as they did not observed any significant difference in CRP of NS group and control group. This normal level of CRP in NS group may be due to an insignificant loss of CRP in urine.[25,26]

CONCLUSION

Findings of the current study suggest that dyslipidaemia is associated with nephritis syndrome. This high level of lipoprotein can lead to future cardiovascular disease in nephrotic syndrome patients. Although, CRP level which is a strong predicator of CVD has been found in normal limits in the present study; nevertheless, risk of future CVD cannot be ruled out. However, more studies on large populations are required to establish a relation between lipid profile, CRP and nephrotic syndrome.

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