ISSN: 0975-8585

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Study Of Fasting Lipid Profile In Non-Diabetic Young Patients Admitted With Stroke.

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ABSTRACT

Stroke is the most common cause of death in the developed world after cancer and ischemic heart disease and it is the most common cause of physical disability. Ischaemic stroke in young patients has been extensively studied in the past few years. Dyslipidemia is associated with increased risk of stroke and carotid atherosclerosis.This study aims to study serum lipid profile in non diabetic young stroke patients and to determine the correlation between serum lipid profile and ischemic stroke in young non-diabetic patients. A Case control study was carried out on 30 Ischemic Stroke patients, in the age group of 18-45 years and 30 age and sex matched healthy controls. Serum Total Cholesterol, Triglyceride, HDL and LDL were measured. There was a significant difference between cases and controls with regards to mean Total Cholesterol (172.73 ±38.374mg/dL in cases vs 138.9 ±24.398 mg/dL in controls, p=0.012), mean Triglyceride (173.7±77.8mg/dL Vs 124.3±34.8mg/dL, p=0.000), mean HDL (31.07±5.265mg/dL Vs38±9.210mg/dL, p= 0.003) and mean LDL (111.63±37.87mg/dLVs 76.5±20.79mg/dL, p =0.001). The mean value of Total Cholesterol, TGL and LDL are higher in cases and HDL value is lower when compared to controls.Patients with increased Total Cholesterol and LDL value are more prone for developing stroke. Aggressive treatment of dyslipidemia and life style modification will decrease the risk of stroke.
Keywords: young stroke,non diabetic, Lipid profile, LDL , Triglycerides.

https://doi.org/10.33887/rjpbcs/2023.14.1.7

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INTRODUCTION

Stroke is a leading cause of serious long term disability. In India the Prevalence of stroke in young individuals (<40 yrs old) increases from 10 to 15% of all strokes.one-fifth of all strokes occur below the age of 40. Various abnormalities in lipid profile have been reported in young patients with stroke. Both hypercholesterolemia and hypertriglyceridemia were found tobe important riskfactors for atherosclerosis[5]. Apart from implementing effective stroke prevention programs, identification of factors associated with more severe stroke may help to ease the burden of this coming epidemic [1-6].

Stroke in young adults is of growing concern because of impact of early disability [7]. Diabetic angiopathy is presumed to be different from non diabetic angiopathy and stroke in non diabetic individuals have different pathophysiology [8]. Changes in lipid profile are considered as important risk factors in the occurrence of stroke. The metabolic pathways of triglycerides and HDL-C are related, and an increase in one will usually be accompanied by a decrease in the other (a rise in the HDL-C level will be accompanied by a drop in the triglyceride level,and vice versa). The mechanism of lipid changes related in part to the stress and associated catecholamine overproduction of an acute stroke [9]. Elevated blood lipid levels can cause endothelial inflammation, theoretically increasing the likelihood of forming thrombosis. Low HDL-C was reportedly associated with increased possibility of ischemic stroke [10, 11] TG may also stimulate atherogenesis through availability of excessive free fatty acids, production of proinflammatory cytokines, fibrinogen, coagulation factors and impairment of fibrinolysis [12].

Dyslipidemia being a modifiable risk factor for stroke if treated properly it decreases the incidence of stroke [13]. So in this present study we aimed to study the effect of lipid profile in non diabetic young ischemic stroke patients

MATERIALS AND METHODS

A hospital based case control study was conducted in a tertiary health care after obtaining Ethical committee approval.

Study subjects, inclusion and exclusion criteria

30 patients with CT Scan Brain (Plain) proven Ischemic Stroke, with clinical signs and symptoms of stroke and of the age group 18-45yrs were taken as cases.30 healthy individuals who were age and sex matched with the cases are taken as controls.

Patients with associated disorders like Diabetes mellitus, Hemorrhagic stroke, patients on diet or other modifications that would lower the plasma lipid levels, patients with suspected emboli of cardiac origin, central nervous system infections, peripartum stroke, head trauma, central nervous system tumours, seizures were excluded from the study . Informed consent was obtained from all the study participants.

Investigations Done

About 5 ml of blood was drawn after 8 hours of fasting using disposable syringes and needles under strict aseptic precautions, from cubital vein and collected in a test tube. Fasting blood glucose, Fasting lipid profile were analyzed. Blood glucose was assayed by the glucose oxidase method. Total cholesterol, HDL and TGL were estimated by CHOD-PAP method, Direct method and Enzymatic method respectively. FRIEDEWALDS formula was used to calculate LDL = TC – (HDL + TGL / 5).We noted history of cigarette smoking, presence of hypertension, We also obtained the NIHSS score and CT Brain (Plain) report.

ANALYSIS AND RESULTS

Statistical analysis was performed using SPSS for windows version 20. The mean and standard deviation for quantitative variables and percentage for qualitative variables were calculated for 30 young ischemic stroke patients and 30 healthy controls. Chi square test was used to compare differences in the percentage of qualitative variables between the groups. Differences in means of quantitative variables between the two groups were compared by student t test. p-value of less than 0.05 is considered significant.

DISCUSSION

Stroke is the leading cause of morbidity and mortality. A major proportion of stroke patients have dyslipidemia which is the risk factor for stroke. The mean age of subjects with ischemic stroke was 38 ± 6.043 years while in the controls, the mean age was 37.37 ± 6.031 years. There was no significant difference among the cases and controls with respect to age groups. Among the cases and controls 66.7% were males and 33.3% were females. There was no difference in gender distribution between cases and controls.There was no significant difference in baseline characteristics such as age, gender and Blood pressure between the groups.FBS is normal in both cases and controls.There was no significant difference between cases and controls with regards to mean FBS(97.17±5.84.3mg/dLin cases vs 93.97±4.064 mg/dl in controls, p=0.06).

There was a significant difference between cases and controls with regards to mean Total Cholesterol (172.73±38.374 in cases vs 138.9±24.39 mg/dL in controls, p=0.012), mean Triglyceride (173.7±77.8mg/dLin cases Vs 124.3±34.8 mg/dL in controls, p=0.000), mean HDL (31.07±5.265mg/dL in cases Vs 38±9.21mg/dL in controls,p= 0.003), mean LDL(111.63 ±37.877mg/dL in cases Vs 76.5±20.79mg/dL in controls, p =0.001). This observation supports the earlier reports. In 1993 Alok Mohankar, Ravindrakumar et al study proved that impressive correlation of increased LDLc and decreased HDLc to the atherosclerosis [14] Mehndiratta MM et al [15] showed abnormal cholesterol and triglycerides levels as a risk factor.. Anseil B.J. et al in 2000 concluded that patients with established atherosclerosis should be treated with a statin to achieve LDLc levels less than 100mg/ dl for the reduction of stroke incidence [16]. Another study by Jukka Putaala et al, found dyslipidemia to be a significant risk factor, with a higher propensity to cause posterior circulation strokes [17].

Table 1: Comparison Of Baseline Characteristics Among Cases And Controls

S.No	Characteristic	Case (n=30) Mean ± SD	Control (n=30) Mean ± SD	p-Value
1.	Age in years	38 ± 6.043	37.37 ± 6.031	0.695
2.	Age groups (N%) 1. 18 to 30 years 2. 31 to 40 yrs 3. 41 to 45 yrs	 8(26.7%) 8 (26.7%) 14 (46.6%)	 7(23.3%) 10 (33.4%) 13 (43.3%)	0.850
3.	Gender (Female in N,%)	66.7%	33.3%	1.00
4.	Blood pressure in mm of Hg 1. Systolic 2. Diastolic	 148.93±10.863 89.8 7± 8.370	 144.27±12.47 88.87± 12.145	 0.283 0.095

Table 2: Comparison Of Lipid Profile And FBS Among Cases And Controls.

S.No	Analyte	Case Mean ± SD	Control Mean ± SD	p- Value
1	Total Cholesterol	172.73±38.374	138.9±24.398	**0.012***
2	Triglyceride	173.7±77.8	124.3± 34.8	**0.000***
3	HDL Cholesterol(Direct)	31.07±5.265	38±9.21	**0.003***
4	LDL Cholesterol	111.63±37.877	76.5±20.79	**0.001***
5	FBS	97.17 ±5.843	93.97 4.064	0.017

***Statiscally significant**

Figure 1: Comparison of mean serum cholesterol between cases and controls

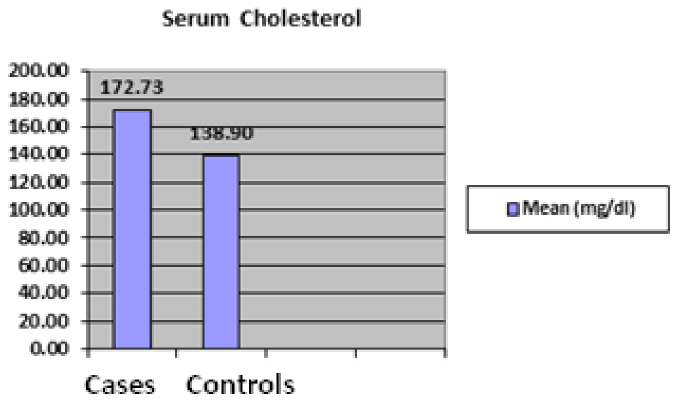


Figure 2: Comparison of mean serum Triglyceride value between cases and controls:

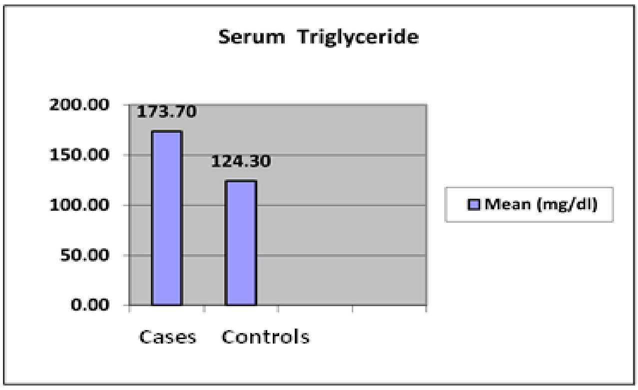


Figure 3: Comparison of mean serum LDL value between Cases and Controls

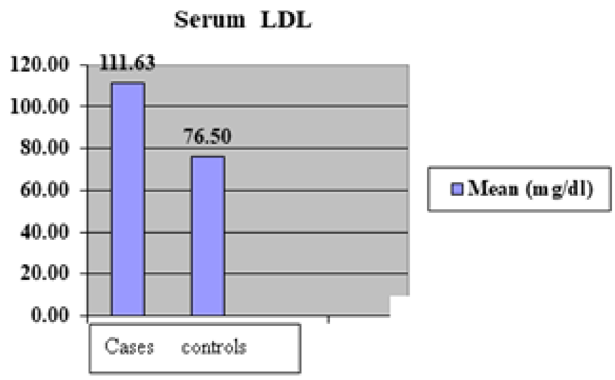
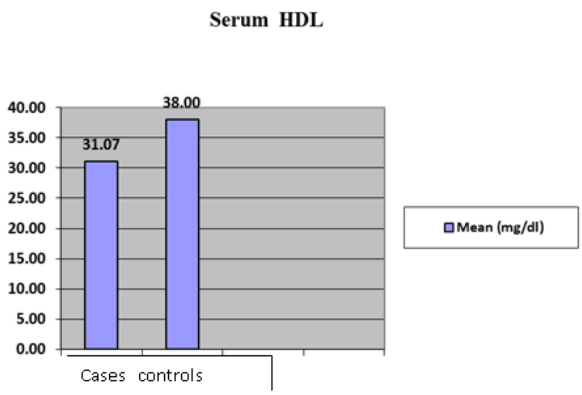


Figure 4: Comparison of mean serum HDL value between Cases and Controls:



ISSN: 0975-8585

CONCLUSION

Our study showed significant association of total cholesterol, triglycerides, LDL cholesterol in non-diabetics with stroke. High levels of total cholesterol, triglycerides, LDL cholesterol are associated with higher risk of stroke. Lowered HDL cholesterol levels were significantly associated with stroke. Dyslipidemia being a modifiable risk factor for stroke if treated properly it decreases the incidence of stroke. Use of lipid-lowering agents in these patients may reduce morbidity and mortality due to dyslipidemia in stroke patients [18, 19]. This leads to decreased morbidity and mortality due to dyslipidemia leading to a healthier society.

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