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STUDY OF LIPID PROFILE IN PATIENTS WITH NON-DIABETIC ISCHAEMIC STROKE

General Medicine

Dr. Chetan Ware MD MEDICINE, Junior Resident, GMCH,Aurangabad,India

Dr. Mamta Muley* MD MEDICINE, Associate Professor, GMCH,Aurangabad,India *Corresponding Author

ABSTRACT

Introduction: Stroke is common emergency & common cause of physical disability. Relation between stroke & atherosclerosis is well known. Dyslipidaemia being precursor for atherosclerosis should be treated aggressively to reduce incidence of stroke and to improve the clinical outcome in the patients with stroke.

Objectives: To study fasting serum lipid profile in patient with non-diabetic stroke and to determine significant correlation between them. To assess the role of aggressive control of dyslipidaemia on recovery of stroke.

Material & Methods: Patients taken for the study subjected to Fasting lipid profile at presentation and follow – up at 12 weeks to re-check the fasting lipid profile and correlate recovery of stroke.

Results: STC was abnormal in 22 patients at onset and 16 patients after 3 months of therapy. TG was abnormal in 68 patients at onset & 70 patients after 3 months of therapy. LDL was abnormal in 64 patients at onset & 40 patients after 3 months of therapy. HDL was abnormal in 76 patients at onset & 70 patients after 3 months of therapy. VLDL was abnormal in 68 patients at onset &70 patients after 3 months of therapy. Correlation between mNIHSS score and lipid profile showed significant clinical improvement with reduction in LDL levels & corresponding P value is 0.000 which is highly significant. Correlation between MRS score and lipid profile showed a good clinical outcome with reduction in LDL levels & corresponding P value is 0.026 which is significant.

Conclusion: Study showed higher levels of STC, TG, LDL, HDL, VLDL is not a risk factor for occurrence of ischaemiccerebro-vascular disease (CVD). Decrease in LDL levels shows significant improvement in clinical outcome.

KEYWORDS

ischaemic Stroke, Diabetes Mellitus, Dyslipidaemia, NCCT/MRI-Brain

INTRODUCTION

Stroke is the most common cause of death worldwide[1]; after cancer and ischemic heart disease. It has been reported to be the most common cause of physical disability. Stroke is a common medical emergency. The incidence is rising steeply in many developing countries due to the adoption of less healthy life styles.

The risk factors include diabetes, hypertension, dyslipidaemia, atherosclerosis, age, smoking and other rare causes. There is good evidence that modification of modifiable risk factor will reduce the risk of the stroke[2]. Some studies have shown that elevated levels of serum lipids are important risk factors for the development of atherosclerosis which is the precursor of stroke. So, aggressive treatment of dyslipidaemia will decrease the risk of stroke[3].

The evidence available relating to the relation between serum lipids, lipoproteins and cerebrovascular accidents is not adequate. The meagre reports are available in Indian patients who have different social, living and dietary habits compared to the western populations.

OBJECTIVES:

1. To study fasting serum lipid profile in patient with non-diabetic stroke and to determine significant correlation between them.
2. To assess the role of aggressive control of dyslipidaemia on recovery of stroke.

MATERIALAND METHODS:

It was a Prospective Study.Patients admitted at a tertiary care centre with features of stroke like hemiplegia or hemiparesis,hemi-anaesthesia,language dysfunction secondary to ischaemic stroke only were enrolled in this study. Detailed history taken and detailed Neurological examinationdone. Blood sampling after 12 hours fasting for Serum Total Cholesterol(STC),Serum Triglycerides (TG),Serum HDL, Serum VLDL, Serum LDL, Fasting and Post-prandial blood sugar levels and HbA1Cwere done. NCCT/ MRI- Brain of all patients done. All the patients started on Atorvastatin 40mg HS. Repeat Serum Lipid Profile of all the patients done after 12 weeks. mNIHSS& MRS scores calculated for each patient on admission and after 3 months therapy. Results compared with lipid profile at onset.

RESULTS:

1. The change of STC after 3 months is 13.14mg/dl ± 18.3mg/dl & P value is< 0.01 which is highly significant.2.The change of Serum TG after 3 months is 23.6mg/dl ± 31.18mg/dl & P value is < 0.01 which is highly significant.
3. The change of Serum LDL levels after 3 months is 12.04mg/dl ± 12.36mg/dl & P value is <0.01 which is highly significant.
4. The change of Serum HDL levels after 3 months is 2.76mg/dl ± 4mg/dl & P value is <0.01 which is highly significant.5.The change of Serum VLDL levels after 3 months is 3.72mg/dl ± 7.5mg/dl &Pvalue is< 0.01 which is highly significant.

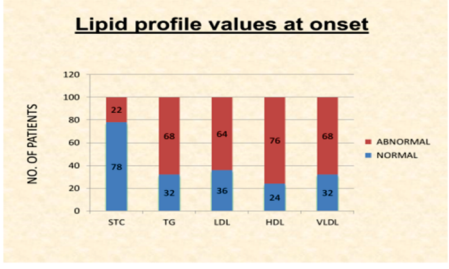

Fig No.1

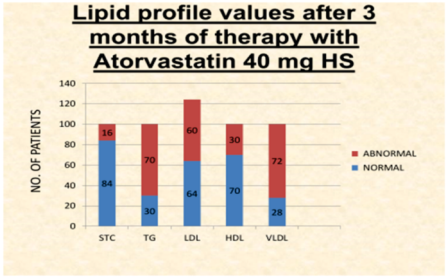

Fig No.2

Table No.1

Lipid Profile Parameter	At onset		After 3 months therapy	
STC	78	22	84	16
TG	32	68	30	70
LDL	36	64	60	40
HDL	24	76	70	30
VLDL	32	68	28	72

6.Correlation between mNIHSS(modified National Institute of Health

Stroke Score and lipid profile showed significant clinical improvement with reduction in LDL levels & corresponding P value is 0.000 which is highly significant. 7.Correlation between MRS (modified Rankin Scale) score and lipid profile showed a good clinical outcome with reduction in LDL levels & corresponding P value is 0.026 which is highly significant.

DISCUSSION:

Epidemiological studies suggest that patients with elevated lipid levels are at higher risk for atherothrombotic brain infarction than those with normal values and this applies mainly to premature ischaemic stroke.
Serum lipids have been incriminated in the pathogenesis of atherosclerosis, but very little is known concerning the possible inter-relationship between abnormal levels of serum lipids and development of vascular complications. Lipid composition of the intima of the arteries resembles that of serum, therefore it is believed that there should be possibility of inter-relationship between abnormal lipid levels and ischaemic stroke. Hence Dyslipidemia has emerged clearly as a major risk factor associated with increased risk of atherosclerosis.

Cholesterol-

The study showed no relationship with cholesterol levels and stroke incidence which co- relates with studies conducted by Prospective studies collaboration 1995; Dauber et al, Kagan et al, Harmisenet al[4].

In present study the cholesterol levels after 3 months of statins showed a significant fall with no significant clinical improvement.

Benfanteet al[5] and Di Mascio et al[6] had found positive co-relation between serum cholesterol and stroke incidence which is not co-related in the present study.

Rastenyte et al[7] and Hart et al found that serum cholesterol levels are not related to risk of death from stroke which co-relates with the present study.

TRIGLYCERIDES-

Several studies such as Nubiolaet al[8], Sulonen and Puska et al, Qizildach et al, Tanne et al[9] and Iso et al indicated high incidence of ischaemic stroke with hypertriglyceridaemia which is contradicted in the present study.

After treatment with statins ,study revealed a significant fall in the triglyceride level but was not significant in the clinical scenario in accordance with MRS scale.

Njolstalet al[10] study states hypertriglyceridemia is weekly associated with ischaemic stroke in women but not in men which is not seen in the present study.

LDL-

William W B Kannelet al[11] referred that relatively a large amount of cholesterol in the LDL fraction was atherogenic, whereas the HDL fraction was protective. Studies revealed the severity of stroke is more in patients with high LDL levels at onset as per mNIHSS.

In the present study the LDL levels declined after starting with statins and showed a significant improvement in the clinical outcome(p value=0.026).

Few studies such as Garg RK et al[12] showed patients with thrombotic stroke to have high LDL levels which is not statistically significant and does not co-relate in the present study and shows significance with the study done by Hachinski et al[13] which states patients have a high risk of thrombotic stroke with high LDL levels at onset.

HDL-

Several studies such as Qizilbach et al, sjd haram et al, lindgren et al, linden storm et al[14], tanne et al[9], Wannamathe et al Sacco et al[15] and Koren Morag et al indicated ischaemic stroke was associated with low levels of HDL which was not significant in the present study.

Simons et al in his study concluded that increase in HDL cholesterol is protective in ischaemic stroke which was similar to study conducted by Northern Manhattan study group which stated significant reduction in Ischaemic stroke with increase in HDL levels which was contradicted in the present study.

High levels of HDL at onset did not show any significant co-relation with severity of stroke at onset and with 3 months of therapy with statins there was significant change in the HDL levels and with no improvement in the clinical outcome as seen in the present study.

VLDL-

In the present study high VLDL levels at onset did not show co-relation with severity of stroke. After starting therapy with statins the outcome at 3 months showed a decrease in the VLDL levels but no significant improvement in the clinical outcome.

Garg RK et al[12] stated increased risk of thromboembolic stroke with high serum VLDL levels which is not relevant in the present study.

CONCLUSIONS:

1. The study showed no significant co - relation between the serum cholesterol &ischaemic stroke incidence.
2. The cholesterol levels after 3 months of statin treatment showed a significant change in the Bio-chemical values but there was no significant clinical improvement.
3. The study showed no significant co-relation between the serum Triglycerides/VLDL and ischaemic stroke incidence.

The Triglycerides & VLDL levels after 3 months of statin treatment showed a significant fall but there was no significant clinical improvement.

4.The study showed a significant clinical improvement with fall in LDL levels after treating with statin for 3months.

5.The study showed no significant co-relation between the HDL and ischaemic stroke incidence .The fasting HDL levels after 3 months of statin treatment showed a significant fall but there was no significant clinical improvement.

LIMITATIONS:

- Only Atorvastatin was used as a hypolipidaemic drug in this study, other classes of statins aren't tried.
- Follow up period in this study was 12 weeks; which is relatively short and more studies are required with long term follow-up.
- Other risk factors for stroke like Hypertension and smoking weren't studied in this study; which will also affect the study results when taken into consideration.
- Patients admitted in only one tertiary care centre are taken into the study. This study doesn't reflect the entire country's population.

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