

## Comparative lipid profile study between ischemic and hemorrhagic stroke

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### Abstract

#### Background:

Changes in the level of lipid profile had been suggested as a risk factor for those patients, developing an ischemic stroke opposite to that with haemorrhagic stroke.

#### Patients and Methods:

This study was included by (50) patients who experienced an ischemic stroke and (50) patients with haemorrhagic stroke of either sex during their admission to Azadi teaching hospital through period of 10th of October 2013 and 10th of October 2014, with an acute onset after full clinical examination and radiological investigation.

The aim of the study was for evaluation of lipid profile with 8-12 hours overnight fasting. By enzymatic colorimetric method.

#### Results:

For those patients with an ischemic stroke (40%) of them had high total cholesterol followed by (14%) of same group with low level of high density lipoprotein cholesterol.

Triglyceride level was nearly same in both an ischemic and haemorrhagic study groups with no different in between them regarding low density cholesterol.

#### Conclusion:

An ischemic stroke patients had higher level of total cholesterol and lower level of high density cholesterol level, than those with haemorrhagic stroke.

**Key word:** Ischemic, haemorrhagic stroke, lipid profile.

### Introduction

**H**yper lipidemia, abnormal elevation of plasma cholesterol and or triglyceride level, is one of the most common clinical problems that faces physicians in the daily practical work. (1) Lipids are relatively insoluble in water but in the body fluid as soluble protein known as lipoprotein. (2) And their disturbances may lead to heart

disease, pancreatitis and neurological disease. (3)

Stroke definition is rapid development symptom and focal or global cerebral dysfunction for 24 hours due to vascular cause with no other causes. (4)

Several clinical trials showed that an association between high blood cholesterol level and ischemic stroke. (5,6)

Stroke is the cause of (12.5%) of death, so it is important to deal with

it's risk factors as morbidity and mortality rate.(7,8)

Hypercholesterolemia increases the blood viscosity and increases the adhesiveness and aggregation of red blood cells.(9)

Meta analysis of some studies show that higher level of total cholesterol, greeter in the risk of stroke while high level of high density cholesterol being lower the risk.(10,11)

(1 mmol/L) lowering of total cholesterol was associated with (13%) reduction of ischemic stroke which considered as useful clinical tool.(12,13)

### Patients and Methods

The study were included by (50) acute ischemic stroke and (50) hemorrhagic one, who had been a demitted to Azadi teaching hospital in the neurological deportment through the period between 10th of October 2013 till 10th of October 2014. These cases had been diagnosed after full clinical examination and Brain computerized tomography was done for them.

The study was involved by these cases of both sex and age between (45-80) years.

Ischemic stroke of 24h. duration and hemorrhagic stroke of primary type, are included in the study. While secondary hamaowhge for cerebral tumor, caagutation disorder or liver disease and familial hyper choleateroemia, were excluded.

On the 2nd day of admission and after of 9-12 hours over night fasting the patient was sent for lipid profile by enzymatic colorimetric test.

The end result were analyzed and looking for significancant changes between two study groups regarding the lipid profile.

### Results

Table 1

Revealed the demographic data regarding the study groups mean age for ischemic stroke was while hemanahgic groups.

Table 2

Study sample distributed according to sex.

Ischemic stroke cases (74%) of them were male and (26%) were female

Hemorrhagic stroke case (70%) of them were male and (30%) were female, mean age for ischemic group was (61.3) year and for hemorrhagic group is (58.8) year.

Table 3

Revealed the percentage of the study group with abnormal lipid profile.

(40 %) of ischemic stroke had high level of total cholesterol

(14. %) of ischemic stroke had low level of high density cholesterol

While triglyceride level was nearly similar in both ischemic and hemorrhagic group.

For the low density cholesterol was equal in both groups as (4%).

Table 4

Revealed mean of abnormal level profile: both groups, total cholesterol mean valuem in ischemic stroke (195+-30) while in hemorrhagic group as (150+-30).

High density cholesterol in ischemic group as (40+-5) while it was (46+-4) for the hemorrhagic group.

### Discussion

Serum total cholesterol is increased in stroke due to stress and catecholamine secretion. (3)

Qizil bash et at. In review of studies examining the relationship between serum total cholesterol and subsequent stroke was declared that their is significant association.(14)

Dyslipidemia was associated with both types of stroke, however hyper cholestroemia are more associated with ischemic stroke and low level of high density lipoprotein cholesterol is appeared to be more significant in ischemic stroke of our study group

Hyper lipidemia was present in (16%) of stroke patients with the study by khan et al while in the our present study hyperlipidemia was more significant prevalence in comparison with haemorrhagic stroke, no explanation but serum cholesterol affect the vasculature it self.(5)

Total cholesterol level is high within 48 hours of onset of ischemic stroke.(15) that result is identical with our ischemic stroke group .

The present study revealed that serum high density lipoprotein cholesterol of low level in ischemic stroke group as Osama A et al.(16)

The study of Mehmood et al. Revealed that in ischemic stroke high level of total cholesterol and low level of high density lipoprotein cholesterol while the opposite to the haemorrhagic stroke which is identical to our study results.(17)

Our result regarding lipid profile with ischemic stroke are seconds by sugata.(18)

Copenhagen city heart study revealed linear association between serum triglyceride and ischemic stroke.(19) while our study revealed negative association

## Conclusion

Dyslipidemia, as high level of total cholesterol and low level of high density lipoprotein cholesterol has relationship with ischemic stroke as a risk factor in comparison with hemorrhagic stroke.

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Table 1: Study sample groups of stroke distributed according to the age group.

Stroke type	Age group				Total
	45-50Y.	50-60Y.	61-70Y.	More than 70Y.	
Ischemic	1(2%)	16(32%)	24(48%)	9(18%)	50(100%)
Hemorrhagic	5(10%)	20(40%)	17(34%)	8(16%)	50(100%)

Table 2: Study sample distributed according their gender.

Stroke type	Patient number	Mean age	Male	Female
Ischemic	50	61.3	37(74%)	13(26%)
Hemorrhagic		58.8	35(70%)	15(30%)

Table 3: Percentage of patient with either stroke type, with abnormal lipid profile level.

Lipid profile (abnormal)	Number of stroke with abnoemal level	
	Ischemic	haemorrhgic
High total cholesterol	20(40%)	6(12%)
High triglyceride	3(6%)	2(4%)
High low density cholesterol	2(4%)	2(4%)
Low high density cholesterol	14(28%)	4(8%)

Table 4: Mean of abnormal levels of lipid profile in both ischemic and hemorrhagic groups.

Lipid profile (normal)	Estimated level of lipid profile in stroke	
	ischemic	hemorrhagic
Total cholesterol ( $<200$ mg/dl)	195 $\pm$ 30	150 $\pm$ 30
Triglyceride ( $<150$ mg/dl)	140 $\pm$ 20	120 $\pm$ 35
Low density cholesterol ( $<130$ mg/dl)	100 $\pm$ 20	91 $\pm$ 20
High density cholesterol ( $>40$ mg/dl)	40 $\pm$ 5	46 $\pm$ 4