



Study of Serum Lipid Profile in Stroke Patients

KEYWORDS

stroke, cholesterol, ischemic

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ABSTRACT Stroke is a focal neurological deficit when blood supply to a part of brain is interrupted or severely reduced, depriving brain tissue of oxygen and nutrients. Current study aims to find the association of one common risk factor of cardiovascular complications namely lipid levels in stroke patients. Stroke patients admitted in the neurology ward were recruited in this study of both genders and around 21 - 85 years old. Patients who are on medication that would lower plasma lipid levels were excluded. A total number of 100 stroke cases admitted in Govt. General Hospital, Kurnool were studied. Maximum number of cases occurred in the age group of 41-60 years, and were 55%. Out of 100 cases 84 patients were Ischemic stroke and 16 patients were Hemorrhagic stroke. Total cholesterol was elevated in 34.5% of Ischemic stroke patients and 31.2% of Hemorrhagic stroke patients. Decreased HDL cholesterol was found in 53.5% of ischemic stroke patients and 31.2% hemorrhagic stroke patients.

INTRODUCTION

Stroke is a term that describes a clinical event caused either by occlusion or hemorrhage in the arterial supply to the central nervous system resulting in tissue infarction. It is the third most common cause of death in the developed world after cancer and ischemic heart disease and is the most common cause of severe physical disability incurring extremely high medical, societal and financial costs. Serum lipid levels have an established effect on short term mortality due to strokes. It is important to evaluate the serum lipid levels in both the types of strokes to guide lipid lowering therapy which can reduce incidence of stroke and related mortality by adapting primary and secondary preventive measures among the stroke patients [1, 3]. Recent community surveys from many regions of India show a crude prevalence rate for stroke presumed to be of vascular origin in the range of 200/100,000 persons (0.2%) [3]. In approximately 1% of all patients with ischemic stroke and in up to 4% of young adults with stroke, the major precipitant of brain ischemia is mainly by blockage of artery with free radicals and lipid molecules [4-6]. Serum HDL-cholesterol has anti-atherogenic properties with ability to trigger the flux of cholesterol from peripheral cells to the liver and thus having a protective effect [7].

MATERIAL AND METHODS

The study was conducted in the Department of Neurology in Govt. General Hospital, Kurnool. The stroke patients admitted in the Department of Neurology, Govt. General Hospital, Kurnool included in this study. The sample size was around 100 and the age groups of the patients were around 21 to 85 yrs.

Inclusion criteria:

- Group 1:- Patients with Ischemic stroke
- Group 2:- Patients with hemorrhagic stroke

The diagnosis of cerebrovascular disease was made on the basis of history and neurologic examination with the evi-

dence of CT scan Brain Group 1 patients were admitted to the Govt. General Hospital, Kurnool with a diagnosis of Ischemic stroke with focal neurological deficit. The total no of patients are 84 with 65 males and 19 females. The age of the patients was in the range of 25-90 years. The duration of symptoms ranged from 11 days to 22 days.

Group 2 comprised of 16 patients of haemorrhagic stroke was identified on the basis of focal neurological deficit accompanied by headache with the evidence of CT scan Brain. Out of 16 patients 11 were males and 5 females. The age of these patients ranged from 30-70 years. The duration of symptoms ranged from 11 -14 days.

Exclusion criteria:

Patients on medication that would lower plasma lipid levels.

In all cases total cholesterol serum LDL cholesterol, serum HDL cholesterol, serum VLDL cholesterol and Triglycerides were estimated. Blood samples were collected from patients after over night fast (12 hours) and 10 days after onset of neurologic deficit to cancel out any effect of stroke on lipid profile. 5-6ml of blood was collected from each patient and after retraction of clot in about 45-60 mts serum was separated, centrifuged to free from cells and the clear serum used for estimation of total cholesterol, triglycerides, HDL cholesterol, LDL cholesterol and VLDL cholesterol.

RESULTS

Table:1 -

Age (years)	No.of cases	Percentage
21-40	11	11
41-60	55	55
61-80	29	29
>80	5	5

The total number of 100 cases of stroke admitted in the Govt. General Hospital, Kurnool. maximum number of cases 55% occurred in the age group of 41-60 years.

Table:2

	No.of cases	Male	Female
Ischemic stroke	84	65	19
Hemorrhagic stroke	16	11	5

Out of 100 cases studied 84 patients presented with Ischemic stroke, includes 65 males and 19 females. 16 patients with Hemorrhagic stroke, includes 11 males and 5 females.

Table: 3

Lipid fractions	No.of cases	Percentage
Triglycerides(>150mg/dl)	29	29
Total cholesterol (>200mg/dl)	34	34
HDL (<40mg/dl)	50	50
LDL (>130mg/dl)	40	40
VLDL (>40mg/dl)	5	5

Prevalence of hyper cholesteremia in our study is 34%.Hypertriglyceridemia is 29% and 50% patients have serum HDL <40 mg/dl.

Table:4

Lipid fractions	Ischemic stroke (no. of patients)	Percentage	Hemorrhagic stroke (no. of patients)	Percentage
Triglycerides (>150mg/dl)	23	27.3	6	37.5
Total cholesterol (>200mg/dl)	29	34.5	5	31.2
HDL (<40mg/dl)	45	53.5	5	31.2
LDL (>130mg/dl)	35	41.6	5	31.2
VLDL (>40mg/dl)	3	3.5	2	12.5

In our study elevated total cholesterol is seen in 34.5% of patients with Ischemic stroke and 31.2% of patients in Haemorrhagic stroke. There is no significant difference in total cholesterol values between Haemorrhagic stroke and Ischemic stroke. Decreased HDL cholesterol found in 53.5% of patients in Ischemic stroke and 31.2% patients with Haemorrhagic stroke.

DISCUSSION:

Stroke is a clinical syndrome characterized by loss of cerebral functions, with symptoms lasting more than 24 hours or leading to death with no apparent cause other than that of vascular origin [8]. Cerebral atherosclerosis with atheroma formation is the basic underlying patho-physiologic mechanism in ischemic stroke [9]. Conflicting results exist in the literature about the correlation between the total plasma cholesterol of patients and the risk of stroke [10]. Different environmental factors, genetic influences, and aging are playing a wide role in the prevalence of stroke among the old age group. Hypertension, DM, AF, and high cholesterol are the highest ranking controllable medical risk factors for stroke, whereas smoking, alcohol consumption, and obesity rank as the most important lifestyle stroke risk factors [11]. Dyslipidemia is a major risk factor for coronary heart disease [12], and atherosclerosis not only in stroke patients, but also in old age group who are nearing the age around 60yrs of both the age groups. Rossner *et al.*, from his study reviewed relation to between HDL cholesterol and Ischemic stroke and showed HDL cholesterol was 18% low when compared to healthy controls. Chandra *et al.*, from his study reviewed relation to between total cholesterol and stroke and showed significant increase in cholesterol levels when compared to healthy controls. Qizilbash *et al.* from his study reviewed the relationship between serum total cholesterol and subsequent stroke. They concluded that there was a significant association between serum lipid profile and prevalence of stroke [13]. Khan *et al.* and Tanveer *et al.*, from there study they proved that Hyperlipidemia was present in 16% patients of stroke. They analyzed that the serum lipid profile was 3rd most common risk factor for stroke [4, 14].

CONCLUSION

Abnormal serum lipid profile was found in 64% of patients and most striking features was low HDL cholesterol and elevated triglycerides level, indicating they are independent risk factors for stroke. No significant difference in dyslipidemia was found between hemorrhagic stroke and ischemic stroke patients.

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