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ASSESSMENT OF LIPID PROFILE IN STROKE PATIENTS AT TERTIARY CARE CENTRE OF SOUTHERN RAJASTHAN

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ABSTRACT

Background: The prevalence of non-communicable diseases shows incremental growth after the 20th century and a decrease in the prevalence of communicable disease. Stroke is defined as symptoms and signs rapidly developing of focal or global loss of cerebral function which is lasting for 24 hours or more with the cause of vascular origin with no other apparent cause. **Material & Methods**: The present cross-sectional prospective study was conducted at the department of general medicine of our tertiary care hospital. 50 Patients who were diagnosed with acute cerebrovascular disease admitted to the medical ward of the hospital were enrolled for the study. Clearance from Institutional Ethics Committee was taken before the start of the study. **Results:** Total cholesterol was abnormal in 80% of ischemic stroke and 20% of hemorrhagic stroke. LDL cholesterol was abnormal in 83.3% of ischemic stroke and 16.6% of hemorrhagic stroke. Triglyceride levels were abnormal in 70.5% of ischemic stroke and 29.5% of hemorrhagic stroke. Non-HDL cholesterol was abnormal in 74% of ischemic stroke and 26% of hemorrhagic stroke. (p-value <0.05). **Conclusion:** Primary prevention by the regular monitor of lipid profile may decrease the risk of atherosclerosis and cerebrovascular disease.

Keywords: Lipid profile, Stroke, Total cholesterol.

INTRODUCTION:

The prevalence of non-communicable diseases shows incremental growth after the 20th century and a decrease in the prevalence of communicable disease **(1)**. Stroke is defined as symptoms and signs rapidly developing of focal or global loss of cerebral function which is lasting for 24 hours or more with the cause of vascular origin with no other apparent cause **(2)**. Stroke is the prevalent cause of mortality worldwide, responsible for one in eight deaths globally. It is also directly responsible for the disability burden for the patients and also on their relatives. Therefore, primordial and primary prevention by effective risk factor intervention denotes the most effective measure to reduce stroke mortality and morbidity **(3)**.

Hypertension and atrial fibrillation have been recognized as independently among some risk factors related to stroke occurrence. The role of lipid profile for independent risk factor in the occurrence of stroke has not yet been well researched, similar facts to that established for cases of myocardial infarction **(4)**. The other previous clinical researches had been reported that increased levels of serum cholesterol were acting as a risk factor for ischemic strokes. However, the role of serum cholesterol in Intracerebral hemorrhage (ICH), was not established. Few kinds of research

have reported hypercholesterolemia as a risk factor for Intracerebral Hemorrhage. Hyperlipidemia is proven as an independent risk factor for acute ischemic stroke (5).

Serum lipids profile shows a strong correlation with the risk of stroke incidence but statistically not reported. The present study attempted to correlate the relationship of lipid profile and stroke; specifically, among patients showing the derangement patterns of lipid profile in the stroke patients and also the post-effect of CVA (on the 1st day and 7th day of the stroke, that is the day of admission after an acute onset).

MATERIALS & METHODS

The present cross-sectional prospective study was conducted at the department of general medicine of our tertiary care hospital. The study duration was of six months from May 2018 to October 2018. A sample size of 50 was calculated at 95% confidence interval at 10% acceptable margin of error by epi info software version 7.2. Patients who were diagnosed for stroke (acute cerebrovascular disease), admitted to the medical ward of our hospital were enrolled for the study. Clearance from Institutional Ethics Committee was taken before the start of the study. Written informed consent was taken from each study participant. Clinical examination was carried out, and detailed history including family and dilatory history were recorded with routine blood investigations were done including fasting lipid profile. Stroke or cerebrovascular accident was defined as "acute cerebrovascular disease which had rapidly developed clinical signs and symptoms of focal, and at the global loss of cerebral function, which can lead to death. There was no, with no other apparent cause of vascular origin. Patients who had a head injury and either primary or secondary brain tumor were excluded from the study.

 The patients were classified based on plain and contrast CT scan findings of the head as having a stroke (ischemic or hemorrhagic). Total cholesterol >200 mg/dl, non-HDL cholesterol >130 mg/dl, triglycerides > 150 mg/dl, and LDL cholesterol was taken as abnormal lipid profile according to NCEP ATP III. Data were categorized and entered in the MS office 2010 spreadsheet and Epi Info v7. Data

analysis was carried out using SPSS v22. Qualitative data were expressed as a percentage (%), and Pearson's chi-square test was used to find out statistical differences between the study groups. If the expected cell count was < 5 in more than 20% of the cells, then Fisher's exact test was used. All tests were done at alpha (level significance) of 5%; means a significant association present if the p-value was less than 0.05.

RESULTS

In the present study, out of 50 patients, 31 were males, and 19 were females, so male predominance was seen. Majority of patients, i.e., 24 patients were in more than 60 age group followed by 16 patients in the 51-60 age group. While 07 and 03 patients were in 41-50- and 30-40-years age groups respectively. The mean age of patients in the present study was 58.8±7.4 years. (Table 1)

Table 1: Distribution of study participants according to age and gender

Age (years)	Male	Female	Total (%)
30-40	03	00	03 (06.0)
41-50	05	02	07 (14.0)
51-60	8	8	16 (32.0)
>60	15	9	24 (48.0)
Total	31 (62)	19 (38)	50(100.0)

In the present study, Abnormal lipid profile was found in 27 patients, and 23 patients had normal lipid profile. Out of which increased non-HDL cholesterol level was found in 27 patients. Increased LDL cholesterol level was found in 18 patients followed by increased triglycerides in 17 patients. Increased total cholesterol level was present in 15 patients. (Table 2)

In the present study, Total cholesterol level was abnormal in 80 % of patients of ischemic stroke and among 20% patients of hemorrhagic stroke. LDL cholesterol level was abnormal in 83.3% of patients of ischemic stroke and among 16.6% patients of

hemorrhagic stroke. Triglyceride levels were abnormal in 70.5% of patients of ischemic stroke and among 29.5% patients of hemorrhagic stroke. Non-HDL cholesterol level was abnormal in 74% of patients of ischemic stroke and among 26% patients of hemorrhagic stroke. (Table 3)

Table 2: Distribution of patients of stroke in normal and abnormal lipid profile

Lipid profile	No. of patients
Normal lipid values	23
Abnormal	27
Increase total cholesterol	15
Increase LDL cholesterol	18
Increase triglycerides	17
Increase non-HDL cholesterol	27

Table 3: Association of Lipid abnormalities in patients based on the type of stroke.

Abnormal parameters	Total	Ischemic stroke (%)	Hemorr-hagic stroke (%)	'p' value
Increase total cholesterol	15	12 (80.0%)	03 (20.0%)	<0.05
Increase LDL cholesterol	18	15 (83.3%)	03 (16.6%)	<0.05
Increase triglycerides	17	12 (70.6%)	05 (29.4%)	<0.05
Increase non-HDL cholesterol	27	20 (74.0%)	07 (26.0%)	<0.05

DISCUSSION

Stroke is defined as symptoms and/or signs rapidly developing of focal or global loss of cerebral functions which are lasting for 24 hours or more with the cause of vascular origin with no other apparent cause. The incidence of stroke in India is much higher than in Western countries. In Indian studies, large vessel intracranial atherosclerosis is published as the most common cause of ischemic stroke along with poor awareness among the population and inadequate infrastructure (**6**). Increasing age was a significant risk factor for the high prevalence of stroke. In India, the mean age of onset of stroke was 63 years (**7**). A study done by Khan J et al. reported that in patients acute ischemic stroke, cerebral atherosclerosis along with atheroma formation was reported as a basic underlying pathophysiologic mechanism (**8**).

In the present study, Abnormal lipid profile was found in 27 patients, and 23 patients had normal lipid profile. Out of which increased non-HDL cholesterol level was found in 27 patients. Increased LDL cholesterol level was found in 18 patients followed by increased triglycerides in 17 patients. Increased total cholesterol level was present in 15 patients. Similar prevalence of lipid profile was reported in a study conducted by Sreenivasulu et al., shows 34% of hypercholesteremia cases, and elevated levels of total cholesterol was seen in 35% of patients with acute ischemic stroke and among 32% of patients with hemorrhagic stroke (**9**).

In the present study, Total cholesterol level was abnormal in 80% of patients of ischemic stroke and among 20% patients of hemorrhagic stroke. LDL cholesterol level was abnormal in 83.3% of patients of ischemic stroke and among 16.6% patients of hemorrhagic stroke. Triglyceride levels were abnormal in 70.5% of patients of ischemic stroke and among 29.5% patients of hemorrhagic stroke. Non-HDL cholesterol level was abnormal in 74% of patients of ischemic stroke and among 26% patients of hemorrhagic stroke. This was comparable to study conducted by Sreenivasulu et al., among a total of 100 patients, among them, 84 patients had an acute ischemic stroke, and 16 patients had a hemorrhagic stroke (**9**). A study conducted by Qizilbash et al. reported that there was a statistically significant association found between serum lipid profile with a prevalence of ischemic stroke (**10**). A study conducted by Tanveer et al., reported that hyperlipidemia was found among 16% of patients of ischemic stroke (**11**). A similar study conducted by

Siddeswari et al., found that among patients of stroke the prevalence of dyslipidemia was 14% **(12)**.

In the present study majority of study participants had serum HDL levels less than 40mg/dl which was a risk factor for stroke. The mean levels of TC and LDL-C were also significantly higher among ischemic stroke patients than patients of hemorrhagic stroke. A study conducted by Gnanamoorthy K et al. reported the similar result as compared to the present study, i.e., mean levels of TC and LDL-C were also significantly higher among ischemic stroke patients than patients of hemorrhagic stroke **(13)**. Dyslipidemia is act as a primary significant risk factor for acute ischemic stroke. The increased levels of low-density lipoprotein cholesterol (LDL-C) and plasma triglycerides and decreased levels of HDL-C, as per current guidelines of the American heart association and NCEP-III guidelines suggest as risk factors for stroke **(14)**.

CONCLUSION

We concluded form present study that abnormalities in lipid profile among stroke patients was prevalent among patient attending our tertiary care hospital. Furthermore, large-scale studies with large sample size are needed to established the risk ratio and to find out the magnitude of this problem of dyslipidemia to generalize the result among the general population with ischemic and hemorrhagic stroke. The regular monitor of the lipid profile of stroke patients acts as primary prevention and may decrease the relative risk of disease burden among patients.

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