

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

Dr. Jagdish Chandra Sharma<sup>1</sup>, Dr.Rajesh Khoiwal<sup>2\*</sup>

1,2.Assistant Professor, Department of Medicine, Pacific Medical College and Hospital, Udaipur

\*Corresponding author - **Dr.Rajesh Khoiwal**

Email id [\\_khoiwalrajesh@yahoo.com](mailto:_khoiwalrajesh@yahoo.com)

*Received:18/06/2018*

*Revised:03/06/2018*

*Accepted:08/07/2018*

### ABSTRACT

**Background:** The prevalence of communicable diseases shows decline in the 20th century and as a result there was increase. Stroke is defined as rapidly developing symptoms and/or signs of focal and global loss of cerebral function lasting for at least 24 hours with no apparent cause other than of vascular origin. **Material & Methods:** The present cross-sectional prospective study was conducted at department of general medicine of our tertiary care hospital. 50 Patients who were diagnosed for r stroke (acute cerebrovascular disease) admitted to the medical ward of hospital were enrolled for the study. Clearance from Institutional Ethics Committee was taken before start of 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:** Regular monitor of lipid profile among stroke patients may decrease the risk of atherosclerosis and cardiovascular disease among the stroke patients.

**Key words:** Lipid profile, Stroke, Total cholesterol.

### **INTRODUCTION:**

The prevalence of communicable diseases shows decline in the 20<sup>th</sup> century and as a result there was increase. Stroke is defined as rapidly developing symptoms and/or signs of focal and global loss of cerebral function lasting for at least 24 hours with no apparent cause other than of vascular origin [1]. Stroke is the cause of one in eight deaths. It also constitutes a dreadful burden of disability for the patients and their relatives. Therefore, effective risk factor intervention represents the most appropriate to reduce stroke morbidity and mortality. While some risk factors such as hypertension and atrial fibrillation have been recognized as independently related to

stroke occurrence, the predictive role of lipid profile has not yet been well established, similar to that reported in myocardial infarction [2–5]. Many of the previous clinical investigations have suggested that increased serum cholesterol is a risk factor for ischemic stroke. Its role in Intracerebral hemorrhage (ICH), however, is not clear. Few studies have indicated hypercholesterolemia as a risk factor for ICH [6].

Strong correlations between plasma lipids concentrations and the risk of stroke have never been clearly established. The present study attempts to associate this; specifically showing the derangement

caused in the lipid profile patterns in the CVA patients and also the effect of stroke on this derangement (on the 1<sup>st</sup> day, i.e. of admission after an acute onset, and on 7<sup>th</sup> day of stroke). Hyperlipidemia is an independent risk factor for ischemic stroke (Gorelick & B etal (1997)). The present study establishes the role of lipids as a factor in stroke risk.

## MATERIALS & METHODS

The present cross-sectional prospective study was conducted at 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 hospital were enrolled for the study. Clearance from Institutional Ethics Committee was taken before start of study. Written informed consent was taken from each study participant. Clinical examination, and detailed history including family and dilatory history were recorded and routine blood investigations and fasting lipid profile were done. Acute cerebrovascular disease was defined as “a stroke or cerebrovascular accident with rapidly developing clinical symptoms and signs of focal, and at the global loss of cerebral function with symptoms or leading to death, with no apparent cause other than that of vascular origin”. Patients with head injury, primary or secondary brain tumor were excluded from the study.

The patients were classified as having ischemic or hemorrhagic stroke definitive on the basis of CT scan of head (plain and contrast). Lipid profile estimation: the percentage of abnormal lipid value (total cholesterol 200 mg/dl, triglycerides > 150 mg/dl, non-HDL cholesterol >130 mg/dl and LDL cholesterol was taken abnormal according to NCEP ATP III.

Data were entered in the MS office 2010 spread sheet and Epi Info v7. Data analysis was carried out using SPSS v22. Qualitative data was expressed as 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 p value was less than 0.05.

## RESULTS

In present study, out of 50 patients 31 were males and 19 were females, so male predominance was seen. Majority of patients i.e. 24 were in more than 60 age group followed by 16 in 51-60 age group. While 07 and 03 patients were in 41-50- and 30-40-years age group respectively. The mean age of presentation 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)
<b>Total</b>	31 (62)	19 (38)	50(100.0)

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

In present study, 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. (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 type of stroke.**

Abnormal parameters	Total	Ischemic stroke (%)	Hemorrhagic 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 a clinical syndrome characterized by rapidly developing symptoms and/or signs of focal and at times global (for patients in coma) 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.<sup>5</sup> Age is an important risk factor for stroke. The mean age of stroke onset in

India (i.e. 63 years).<sup>6</sup> Cerebral atherosclerosis with atheroma formation is the basic underlying patho-physiologic mechanism in ischemic stroke.<sup>7</sup> Out of 50 patients 46% had hemorrhagic stroke and 54% had ischemic stroke in present study. This is comparable to the study conducted by Sreenivasulu et al, where out of 100 cases 84 patients were Ischemic stroke and 16 patients were hemorrhagic stroke.<sup>8</sup>

In this study increased total cholesterol was present in 30% patients. Similar prevalence (34%) of hypercholesteremia was reported by Sreenivasulu et al.<sup>8</sup>

Total cholesterol was abnormal in 80% of ischemic stroke and 20% of hemorrhagic stroke. This is comparable to study by Sreenivasulu et al, where elevated total cholesterol was seen in 34.5% of patients with Ischemic stroke and 31.2% of patients in Haemorrhagic stroke.<sup>8</sup> Qizilbash et al, concluded that there was a significant association between serum lipid profile and prevalence of stroke.<sup>9</sup> Tanveer et al, proved that hyperlipidemia was present in 16% patients of stroke.<sup>10</sup>

In a study by Siddeswari et al, dyslipidemia in stroke patients was 14%.<sup>11</sup> Most of the patients were having low HDL (<40) which is a risk factor for stroke.

The mean TC and LDL-C levels were significantly much higher in the ischemic stroke patients when compared to patients with haemorrhagic stroke by Gnanamoorthy K et al, (183.7±34.5 versus 148.5±30.6 and 118.7±26.7 versus 81.4±22.0).<sup>12</sup> This is similar to the present study results.

Dyslipidemia is a primary major risk factor for coronary artery disease (CAD) and ischemic stroke. It causes insulin resistance which results in increased levels of plasma triglycerides and low-density lipoprotein cholesterol (LDL-C) and a decreased concentration of HDL-C, as an important risk factor for peripheral vascular disease, stroke, and CAD.<sup>13, 14</sup>

Current guidelines of the American heart association and proposed modifications of the NCEP-III guidelines suggest that all patients at risk for stroke or who have had a cerebral infarction should be treated to a goal LDL level of below 70 mg/dL.<sup>15, 16</sup>

## CONCLUSION

Current study shows lipid abnormalities among stroke patients attending a north Indian tertiary care hospital. Further large-scale studies are needed in the Indian population to find out the magnitude of this problem of dyslipidemia in patients with ischemic and haemorrhagic stroke. Regular monitor of lipid profile among stroke patients may decrease the risk of atherosclerosis and cardiovascular disease among the stroke patients.

## REFERENCES

1. Bonita R, Mendis S, Truelsen T, Bogousslavsky J, Toole J, Yatsu F. The global stroke initiative. *Lancet Neurol.* 2004;3:391-3.
2. Powers AC. *Harrison's Principles of Internal medicine, Cerebrovascular Accident.* Maryland. 2012;338:2275-304.
3. Kirshner HS. Medical prevention of stroke. *South Med J.* 2003;96:354-8.
4. Bhalla A, Gupta OP, Gupta SB. Predicting mortality in stroke. *Neurol India.* 2002;50(3):279-81.
5. Banerjee TK, Das SK. Fifty years of stroke researches in India. *Ann Indian Acad Neurol.* 2016;19(1):1-8.
6. Wasay M, Khatri IA, Kaul S. Stroke in South Asian countries. *Nat Rev Neurol.* 2014;10:135-43.
7. Khan J, Attique-ur-Rehman, Ali SA, Jielani A. Frequency of hypertension in stroke patients presenting at Ayub teaching hospital. *J Ayub Med Coll Abbottabad.* 2006;18(1):59-61.
8. Sreenivasulu C, Bai LS, Kumar KN. Study of serum lipid profile in stroke patients, medical science. *Indian J Applied Res.* 2016;6(2):385-6.
9. Qizilbash N, Duffy SW, War low C, Mann J. Lipids are risk factors for ischemic stroke: overview and review. *Cerebrovascular Disease.* 1992;3(2):127-36.
10. Tanveer A. Localization and management in cerebrovascular accident: a comparison of clinical assessment versus CT scan (dissertation). *J Coll Physician Surg Pak.* 1996:5-6.
11. Siddeswari R, Sudarsi B, Abhilash T, Rao NS. A study on risk factors and lipid profile pattern in patients of stroke in Osmania general hospital, Hyderabad, India. *Int J Res Med Sci.* 2015;3:3337- 41.
12. Gnanamoorthy K, Suthakaran PK, Rajendran K, Deepak K. Comparison of fasting lipid profile in ischemic and haemorrhagic stroke patients of a tertiary care hospital. *Int J Adv Med.* 2016;3:755-8.
13. Wild SH, Byrne CD, Tzoulaki I, Lee AJ, Rumley A, Lowe GD, et al. Metabolic syndrome, haemostatic and inflammatory markers, cerebrovascular and peripheral arterial disease. *Edinburgh Artery Study. Atherosclerosis.* 2009;203:604-9.
14. Sacco RL. Risk factors and outcomes for ischemic stroke. *Neurol.* 1995;45:S10.
15. Anthony S, Kim N, S. Claiborne Johnston. Neurologic complications of hypertension. eds. *Aminoff's Neurology and General Medicine.* 2nd ed. USA: Academic Press; 1996:1216.
16. Grundy, Sacco, Anthony S. Kim N, S. Claiborne Johnston. Neurologic complications of hypertension. In: Grundy, Sacco, Anthony S. Kim N, S. Claiborne Johnston, eds. *Aminoff's Neurology and General Medicine.* 2nd ed. USA: Academic Press; 1996 and 2004:1216.