



## LIPID PROFILE IN HEMORRHAGIC STROKE – A STUDY FROM GOVERNMENT GENERAL HOSPITAL / SIDDHARTHA MEDICAL COLLEGE VIJAYAWADA -ANDHRA PRADESH

**DR. T. Sikindar Mohan**

Assistant Professor Government General Hospital / Siddhartha Medical College, Vijayawada.

**DR. R. Siddeswari**

Associate Professor, Government General Hospital / Siddhartha Medical College, Vijayawada. - Co-Author

### ABSTRACT

**Aim and objectives:** To identify and describe lipid profile abnormalities in patients of hemorrhagic stroke.

**Materials and Methods** This is a retrospective descriptive study of 50 patients who were admitted in Government General Hospital Vijayawada during last two years with new onset hemorrhagic stroke. A detailed history physical examination and outcome details of patients were collected from the hospital medical records. Data such as fasting lipid profile, Computed Tomography (CT) or Magnetic resonance imaging (MRI) brain were collected from medical records and studied for lipid abnormalities associated with hemorrhagic stroke.

**Results** A total of 50 patients were studied of whom 24 were males and females were 26. Patients with age <50 years were n=10; age between 51-60 years n=21 between 61-70 years n=12 and age above 71 years n=7. Hypertension is the major risk factor n=30 patients, patients diabetes n=12, both diabetics and hypertensive n=11. Most common sites of bleed was capsuloganglionic n=42, other sites of bleeds include pons n=2, basal ganglia n=2, cerebellar n=2, subarachnoid hemorrhage n=2. Dyslipidemia (defined as ratio of total to HDL cholesterol >4.5 in n=37 of patients as per ICMR report. As per NCEP/ ATP III guidelines in the present study, patients with low HDL Cholesterol (<40mg/dl) were n=39 (78%), high LDL (>130mg/dl) was found in n=27 (54%), high total Cholesterol (>200mg/dl) was found in n=24 (48%), high Triglycerides (>150mg/dl) n=12 (24%) and elevated non HDL c (>130mg/dl) in n=28 (56%). 15 patients (30%) were having 30-40% stenosis of internal carotid artery. Total number of deaths is n=4 (8%).

**Conclusion-** In the present study concludes the increasing age, hypertension, dyslipidemia, Low HDL, elevated LDL and Non HDL are associated with hemorrhagic strokes. As per Indian Council of Medical Research (ICMR) surveillance project report prevalence of dyslipidemia (defined as ratio of total cholesterol to HDL cholesterol >4.5) was in 37 patients. The present study concludes importance of early diagnosis and treatment of hypertension, lipid abnormalities and improving HDL levels by aerobic exercise, weight loss, smoking cessation.

**KEYWORDS :** Hemorrhagic stroke, Lipid profile, Dyslipidemia. Non HDL cholesterol.

### Introduction -

Stroke is a common medical emergency, rising incidence associated with less healthy life style in lower and middle income countries. Incidence is increasing with age, about one-fifth of acute stroke patients die within a month of the event and at least half of those who survive are left with physical disability<sup>1</sup>. Stroke is most common neurological diseases of adult life, presenting with sudden occurrence of a focal neurologic deficit and are broadly categorized as ischemic or hemorrhagic. Ischemic stroke is due to occlusion of a cerebral blood vessel and causes cerebral infarction. The second category hemorrhage, which occurs either within the substance of the brain intra cerebral hemorrhage, or contained within the subarachnoid spaces and ventricular system, subarachnoid hemorrhage<sup>2</sup>.

Spontaneous intra-cerebral hemorrhage (ICH) is the deadliest most disabling and least treatable form of stroke. Poorly controlled chronic hypertension advanced age is an additional risk factor for ICH, with the rate doubling with each decade of life until 80, location of ICH, 50% for deep haemorrhage; 57% for lobar; 42% for cerebellar and 65% for brainstem bleeds<sup>3</sup>. Haemorrhagic strokes occurs due to ruptured cerebral aneurysm in the young and hypertensive intracerebral bleeding in the elderly<sup>4</sup>. Use of cholesterol-lowering drugs has been shown to decrease the incidence of stroke in several studies<sup>5</sup>. The prevalence of dyslipidemia (defined as a ratio of total cholesterol to HDL cholesterol >4.5) was 37.5 % as per of the Indian council of Medical Research (ICMR) surveillance project report among adults aged between 15-64 years and even higher (62%) in industrial areas<sup>5</sup>. Non-HDL cholesterol (total cholesterol - HDL) is more comprehensive measure to assess atherogenic lipoprotein than LDL-C alone<sup>6,7</sup>.

### Materials and Methods:

This is a retrospective descriptive study of 50 patients who were admitted in Government General Hospital Vijayawada during last two years with new onset hemorrhagic stroke. A detailed history physical examination and outcome details of patients were collected from the hospital medical records. Data such as fasting lipid profile, CT or MRI brain reports were collected from medical records and studied for lipid abnormalities associated with hemorrhagic stroke.

**Inclusion criteria:** 50 patients of hemorrhagic stroke as evidenced on neuro imaging between 30 - 101 age groups who were admitted in the

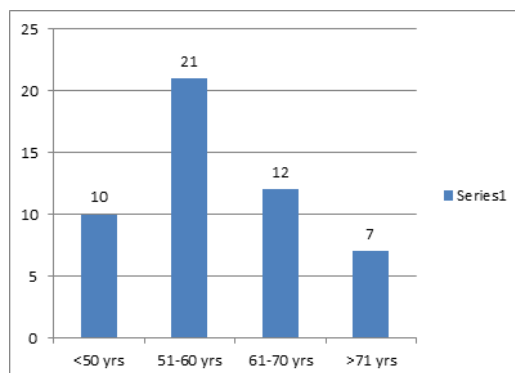
department of general medicine Govt. General Hospital, Vijayawada were included.

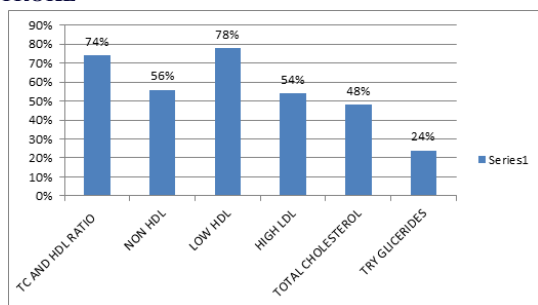
### Exclusion criteria:

Patients, who had brain tumor, head trauma, previously on lipid lowering drugs, were excluded.

### Results

A total of 50 patients were studied of whom 24 were males and females were 26. Patients with age <50 years were n=10; age between 51-60 years n=21 between 61-70 years n=12 and age above 71 years n=7 (Figure 1). Hypertension is the major risk factor n=30 (60%), patients diabetes n=12 (24%), both diabetics and hypertensive n=11 patients (22%). Most common sites of bleed was capsuloganglionic n=42, other sites of bleeds include pons n=2, basal ganglia n=2, cerebellar n=2, subarachnoid hemorrhage n=2. Dyslipidemia found in 37 patients (74%) as per ICMR report. As per NCEP/ ATP III guidelines in the present study patients with low HDL Cholesterol (<40mg/dl) were n=39 (78%), high LDL (>130mg/dl) was found in n=27 (54%), high total Cholesterol (>200mg/dl) was found in n=24 (48%), high Triglycerides (>150mg/dl) n=12 (24%) and elevated non HDL c (>130mg/dl) in n=28 (56%) (Figure 2). 15 patients (30%) were having 30-40% stenosis of internal carotid artery. Total number of deaths is n=4 (8%).



**Figure 1 : AGE WISE DISTRIBUTION OF HEMORRHAGIC STROKE****Figure 2: LIPID ABNORMALITIES IN HEMORRHAGIC STROKE**

**Discussion** - Bleeding directly into the substance of the brain is termed intra parenchymal or intra cerebral hemorrhage. It may occur as a complication of ischemic stroke, termed hemorrhagic conversion, or as the primary injury without preceding ischemia<sup>8</sup>. Intracranial hemorrhage is responsible for 10 to 15 percent of all stroke deaths. Case fatality rates are high, with 35 to 50 percent dead at 1 month and only 20 percent returning to independence at 6 months<sup>9</sup>. Sub arachnoid hemorrhage accounts for approximately 5 percent of all strokes, but it tends to occur at a younger age than other stroke subtypes, with median age at death being 59 years for subarachnoid hemorrhage, 73 years for intra cerebral hemorrhage, and 81 years for ischemic stroke<sup>10</sup>. Risk factors for intra cerebral haemorrhagic stroke include age, hypertension, high cholesterol anti coagulant therapy, thrombolytic therapy arterio venous malformations alcoholism amphetamines and cocaine<sup>1</sup>. Hypertension is associated with three to five fold increased risk of stroke<sup>11</sup>. Hypertension contributes the major intermediate causes of both ischemic and hemorrhagic stroke including carotid stenosis, intracranial, small-vessel arteriosclerosis, and both macroscopic and microscopic aneurysms<sup>12</sup>.

Treatment of hypertension, cessation of smoking, treatment of hyper lipidemia leads to relative risk reduction of stroke by 38%, 50% 16-30%<sup>13</sup>. Rates of intra cerebral hemorrhage increase with age<sup>14</sup>. Cocaine and amphetamine use is associated with increased risk because of transient severe hypertension<sup>8</sup>. Clotting abnormalities with heavy alcohol use may account for an increased incidence of intra cerebral hemorrhage. Excessive anticoagulation and antiplatelet therapy also increase the risk of intra cerebral hemorrhage<sup>15, 16</sup>. HDL cholesterol can be increased by life style modifications such as increased exercise, smoking cessation and adoption of Mediterranean diet<sup>17, 18</sup>.

### Conclusion

The present study concludes, incidence of hemorrhagic strokes increasing above 50 years of age. Hypertension is the major risk factor (60%). Lipid abnormalities include dyslipidemia 74% low HDL in 78%, non HDL Cholesterol in 56%, elevated LDL in 54%, which are considered as risk factors for stroke.

This study upholds the importance of early diagnosis and treatment of hypertension, lipid abnormalities and life style modifications to improve HDL.

**Acknowledgments:** None

**Conflict of interest :** None

### References

- Langhorne P. stroke diseases 27. In Walker BR., Colledge NR, Ralston SH (Eds) Davidson Principles & Practice of Medicine ;2nd edn; Churchill Livingstone; pp.1232-1247, 2013
- Victor M and Ropper AH , Cerebrovascular diseases, Ch.34, In Ropper AH, Samules MA, Klein JP (Eds.) Adam's and Victor's Principles of Neurology, 10th edition, McGraw Hill publications, Pg 778-884., 2014.
- Padma Srivastava M.V., Ajay Garg . Ch20.9. Haemorrhagic Cerebrovascular Diseases. API Text Book of Medicine JP Brother's Publications. 2012. 9th edition, Vol 2. Sec 20.9 Pg 1411-17.
- Dalal. PM . Ischemic Cerebrovascular Diseases. API Text Book Of Medicine JP Brother's Publications. 2012. 9th Edition, Vol 2. Sec 20.8 Pg 1401-1410. .
- Soneil Guptha Lipid and Lipoprotein Metabolism API text book of medicine 10th edition Jaypee brother medical publications ch3 page1690-1692, 2015
- Hirsch GA Vaid N. Blumenthal RS. The significance of measuring non HDL Cholesterol. Preventive cardiology 2002;5(3):156-159
- Expert panel on detection Evaluation and treatment of High blood cholesterol in adults Executive summary of third report of the National Cholesterol Education

- programme.(NECP). Expert panel on detection Evaluation and treatment of High blood cholesterol in adults (Adult treatment panel 111). JAMA 2001;285:2486-2497
- Thrift AG, Donnan GA, McNeil JJ: Epidemiology of intracerebral hemorrhage. Epidemiol Rev 17:361, 1995
- Morgenstern LB, Hemphill JC, Anderson C, et al :Guidelines for the management of spontaneous intracerebral hemorrhage: a guideline for healthcare professionals from the American Heart Association/ American Stroke Association. Stroke 41:2108, 2010
- Johnston SC, Selvin S, Gress DR: The burden, trends, and demographics of mortality from subarachnoid hemorrhage. Neurology 50:1413, 1998.
- Sacco RL: Risk factors and outcomes for ischemic stroke. Neurology 45:S10, 1995
- Meyer JS, Shimazu K, Fukuchi Y, et al: Impaired neurogenic cerebrovascular control and dysautoregulation after stroke. Stroke 4:169, 1973.
- Wade S, Smith Joey, D. English S, Claiborne Johnston, Ch 370. Cerebrovascular Diseases. Harrison's Text book of Medicine, 18th edition, vol 2., McGraw Hill publications .2012. Pg no 3270-3290
- Broderick JP, Brott T, Tomsick T, et al: The risk of subarachnoid and intracerebral hemorrhages in blacks as compared with whites. N Engl J Med 326:733, 1992.
- He J, Whelton PK, Vu B, et al: Aspirin and risk of hemorrhagic stroke: a meta-analysis of randomized controlled trials. JAMA 280:1930, 1998.
- Kase CS, Mohr JP, Caplan LR: Intracerebral hemorrhage. In: Barnett HJM, Mohr JP, Stein BM, Yatsu FM (eds): Stroke Pathophysiology, Diagnosis, and Management 3rd Ed. Churchill Livingstone, New York, 1998.
- American Diabetes Association(ADA). Standards in medical care in diabetes-2006 (Position statement). Diabetes care 2006; (supp. 1) :S4-S42.
- Eposito K, Marfella R, Ciotola M, D Andrea F, Giugliano D. Effect of a Mediterranean-style diet on endothelial dysfunction and markers of vascular inflammation in metabolic syndrome; a randomized trial, JAMA 2004;292:1440-1446.