ISSN: 0975-8585

Research Journal of Pharmaceutical, Biological and Chemical Sciences

A Study on Risk Factors and Lipid Profile Pattern in Patients of Ischemic Stroke in a Tertiary Care Hospital, Maharashtra, India.

Aparna Patange*, Piyush Prajapati, Shilpa Patil, Pradip Warghane, Shruti Rao, and Ajinkya Bahulekar.

Department of General Medicine, KIMS, Karad, Maharashtra, India.

ABSTRACT

Stroke is leading cause of death worldwide. Dyslipidemia is one of the important risk factor in patients with coronary heart disease. To study the association of dyslipidemia with stroke. Study design- Retrospective cross-sectional descriptive study Method of collection of data- A hundred patients between 21 to 95 years of age ,with first ever stroke, during a 18-months period were included in the study. History and physical examination details were collected from patient records. Laboratory investigations were also obtained .Data Analysis- Data collected was analysed by frequency, mean, standard deviation and chi-square test. The lipid profile of the study sample was analysed according to the ATP III classification for identification of dyslipidemia. The findings revealed that 67% of the patients had dyslipidemia . 28% had high total cholesterol, 14% had high triglycerides and only 6% had high LDL. However, 47% of the patients showed low HDL levels. This study showed an association of 67% between dyslipidemia and stroke.These findings are consistent with other similar studies done in Bahrain, Manhattan and Pakistan . They show a definite relationship between dyslipidemia and stroke. The occurrence of the underlying co-morbities of hypertension and diabetes also corroborated with the above mentioned studies. Most of the the patients were having Low LDL level (47%) which is a risk factor for stroke.

Keywords: Ischemic Stroke,Risk factors, Dyslipedemia, HDL, LDL, Cholesterol, Triglycerides.

Corresponding author

ISSN: 0975-8585

INTRODUCTION

Stroke is defined as rapid onset of focal neurological deficit, resulting from diseases of the cerebral vasculature and its contents. The term Transient Ischemic Attacks' (TIA) implies complete recovery of such a deficit within 24 hours. Cerebral or subarachnoid haemorrhage is consequent to rupture through some acquired or inherent weakness of the vessel wall. [1]

In India, where ischemic stroke accounts for 80% of all strokes, 10% to15% of strokes occur in people younger than 40 years and are mostly related to intracranial atherosclerosis. Atherosclerosis involving the large intracranial vessels causes about 8 percent of ischemic strokes.[2,3] According to Indian council of Medical research there were 990, 985 case of stroke in India. [4] The national commission of macro-economics and health has estimated that there will be 1.67 million stroke cases in India by 2015.[5] Stroke is also a leading cause of morbidly with 20% of survivors requiring institutional cater after 3 months and 15-30%remaining permanently disabled.[6]

Ischemic strokes are classified by the underlying cause of the vascular occlusion. One of three main processes is usually operative: (i) atherosclerosis with superimposed thrombosis affecting large cerebral or extracerebral blood vessels, (ii) cerebral embolism, and (iii) occlusion of small cerebral vessels within the parenchyma of the brain.[7]

Older age, family history of thrombotic stroke, diabetes mellitus, hypertension, tobacco smoking, abnormal blood cholesterol [particularly, low High-Density Lipoprotein (HDL) and/or high Low-Density Lipoprotein (LDL)], and other factors are either proven or probable risk factors for ischemic stroke, largely by their link to atherosclerosis.

Identification and control of modifiable risk factors is the best strategy to reduce the burden of stroke, and the total number of strokes could be reduced substantially by these means.[8]

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, [9] stroke, and CAD. Serum HDLcholesterol has anti-atherogenic properties with ability to trigger the flux of cholesterol from peripheral cells to the liver and thus having a protective effect.[1O,11]

MATERIALS AND METHODS

Source of data:

A detailed history and physical examination details were collected from patient records in the hospital medical record department. Laboratory investigations (fasting lipid profile) were also obtained from the records.

Method of Collection of Data: A total of hundred patient records were accessed from the medical records department in krishna medical college, karad

Design Of The Study: Retrospective cross-sectional descriptive study

Duration of the Study: The study was carried out on patients presenting with stroke during a 18-month period from 1ST July 2014 to 31st December 2015.

Inclusion Criteria : A hundred patients between 21 to 95 years of age who were admitted by the Department of General Medicine, Krishna Medical College with first ever stroke, verified by CT scan brain during a 18-month period from July 1st 2014 to December 31st 2015 were included in the study.

Exclusion Criteria: Patients who had a recent myocardial infarction with left ventricular failure, history of syncopal attacks, neurological deficits secondary to epilepsy, infective or metastatic disorder, or pre-existing severe cognitive disorder were excluded from this study.

ISSN: 0975-8585

ATP III classification was followed for dyslipidemia:

Low HDL < 40 mg/dl, High LDL > 190 mg/dl, High Cholesterol >200 mg/dl
High Triglycerides >200 mg/dl

RESULTS

A total of 100 patients were included in this study. Detailed history and physical examination details were obtained from the medical records section. All the patients included in the study were patients with first ever stroke verified by CT scan. Among them, 55% were males and 44% were females. The number of patients with stroke increased as the age group increased. 32% percent of the patients were between 61-70 years of age and 27% were between 51-60 years of age. Thus, over 79% of them were above the age of 50 yrs at the time of presentation.

Table: 1 Demographic data of stroke

No of cases	100
Male	55
Female	45
Mean age of year	62.27
Age range (years)	21-95

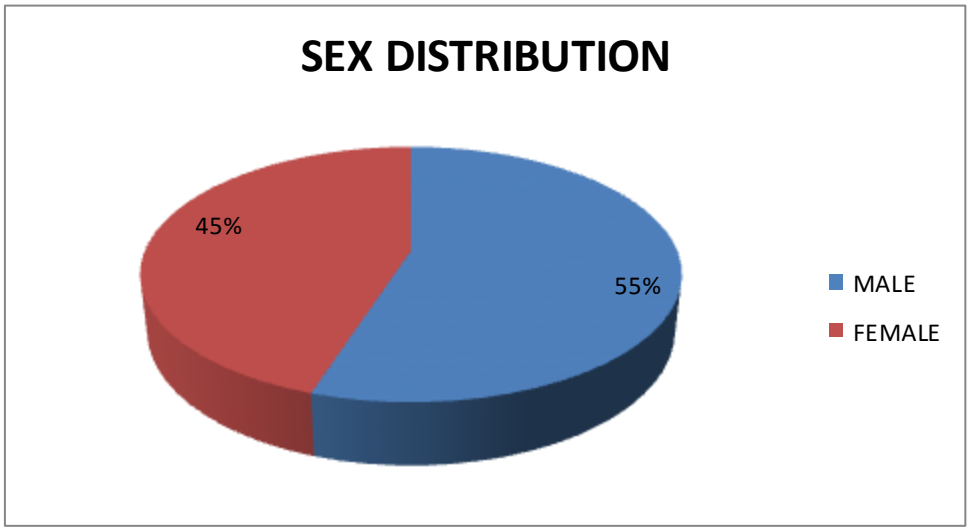

Fig: 1 Sex distribution among study population

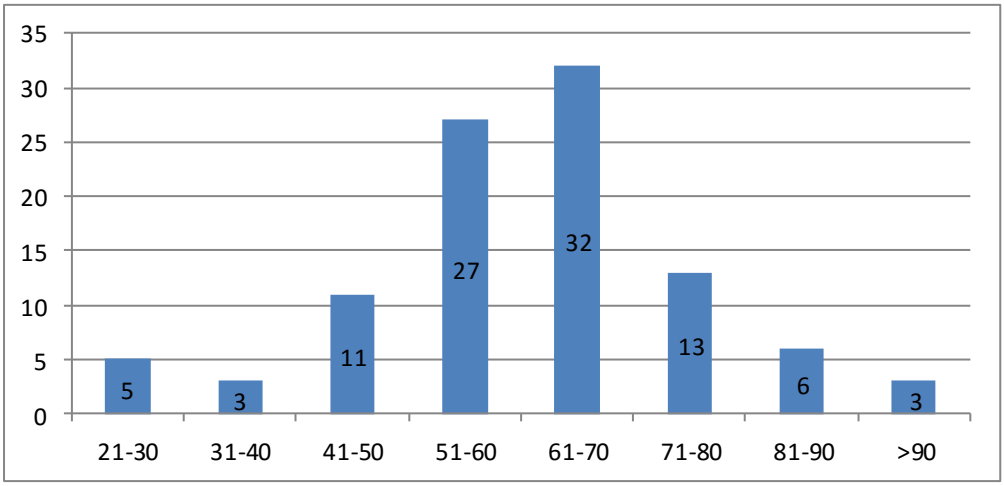

Fig:2 Age Distribution among the study population

ISSN: 0975-8585

The classical risk factors hypertension and diabetes mellitus were also studied. The data showed that 20% were hypertensive and 9% were diabetic. While 12% of the study sample had both hypertension and diabetes.

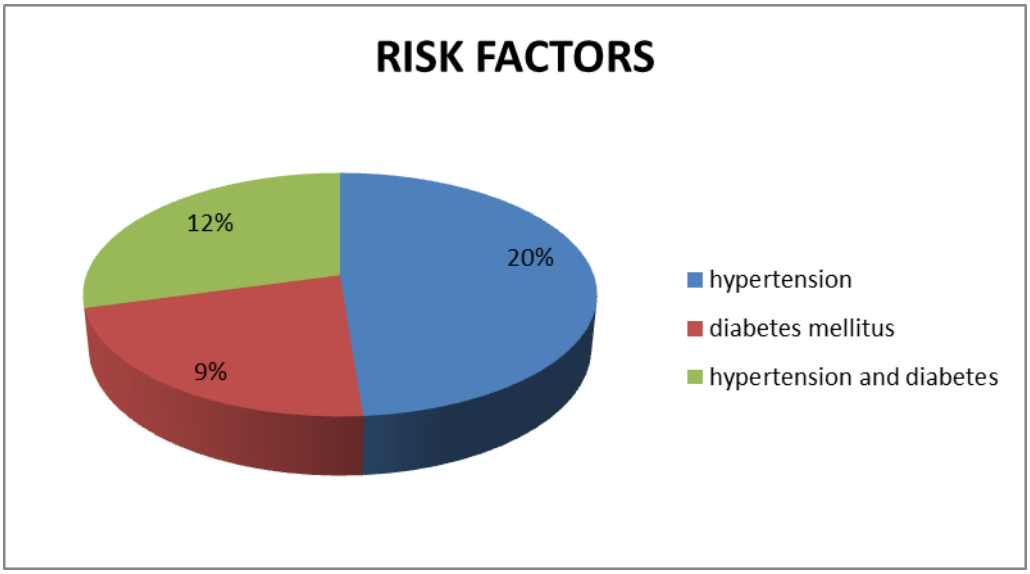

Fig: 3 Risk factors

Table: 2 Lipid profile of iachemic stroke

PARAMETER	MEAN	SD
TOTAL CHOLESTEROL	169.27	44.57
TG	131.4	58.76
VLDL	26.18	11.50
LDL	95.73	35.67
HDL	40.67	11.34

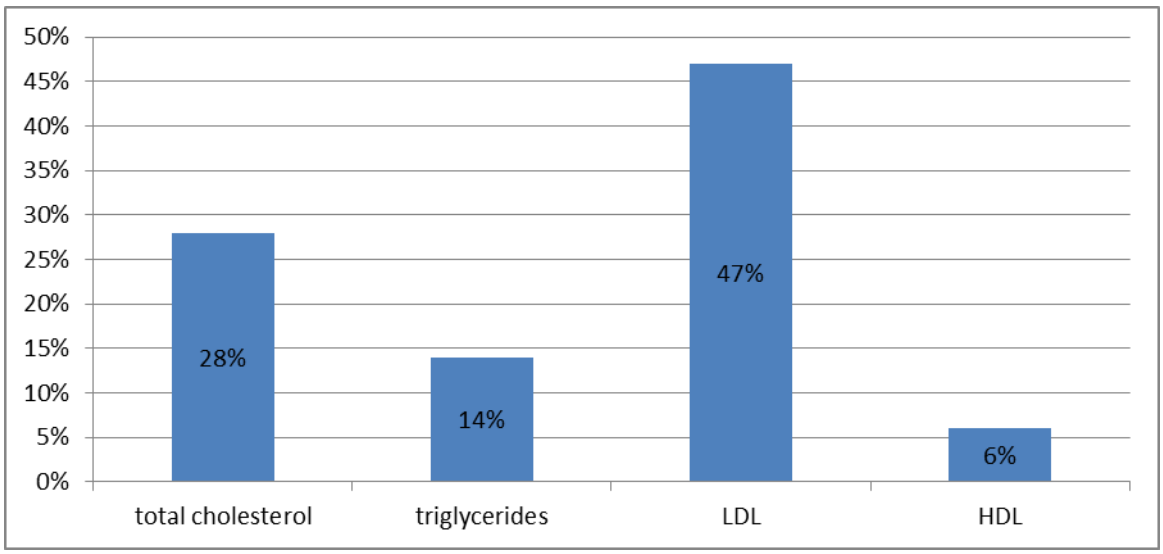

Fig: 4 Lipid profile among stroke patients

The lipid profile of the study sample was analysed according to the ATP III classification for identification of dyslipidemia, Low HDL < 40 mg/dl

High LDL > 190 mg/dl
High Cholesterol >200 mg/dl
High Triglycerides >200 mg/dl

The findings revealed that 67% of the patients had dyslipidemia, thereby proving that a majority of the study population had abnormal baseline lipid profiles . Among the dyslipidemic patients, 28% had elevated total cholesterol, 14% had elevated triglycerides and only 6% had elevated LDL. However, interestingly 47% of the patients showed low HDL levels.

DISCUSSION

Ischemic stroke, which is the most commonly occuring cerebrovascular accident, is mostly due to thromboembolism secondary to atherosclerosis in the major arteries. Nikolai first proposed a link between cholesterol and atherosclerosis in 1912 . In a research, oft cited as a breakthrough research in atherosclerosis in the 20th century, Nikolai and his team proved the obstructive pathophysiology in atherosclerosis occurs as a result of increased cholesterol levels.[12] However, though there exist several risk factors for cerebrovascular disease, atherosclerosis is recognized as one of the leading causes of brain ischemia.

Although risk factors like age, sex, race and gender are non-modifiable factors causing stroke, in this study we will analyse the pattern of the modifiable risk factor, lipids in patients with stroke.

Our study showed a preponderance of males among the study population thus reflecting an overall male sex presdisposition to stroke. The total males under study were 55% while the females under study were 45%. This corroborated with a study done on lipid profile in stroke in Bahrain which also showed an increased incidence in stroke among the males when compared to females.[13]

An age distribution among the study population was also analysed and clustering of cases was found between 61-70 years of age. A majority of the study population was above the age of 50 years., thereby affirming the increasing trend of stroke with age. This also correlates with data obtained from a study on lipid profile done on stroke patients in Northern Manhattan where the mean age was 68.8%.[14]

Moving further east, a study done on lipid profile in Pakistan also showed an increased frequency of patients (28%) figuring within the 61-70 age group.[15]

This study also analysed the other risk factors frequently encountered in stroke such as hypertension and diabetes. 20% of the patients were found to be hypertensive while 9% were diabetic. Both hypertension and diabetes were noted in 12% of the population . On comparing these results to the lipid profile study done in Bahrain, hypertension was found to be the consistent major risk factor in the occurence of stroke.

The core of this study revolved around identification of an association between dyslipidemia and ischemic cerebrovacular accident. The percentage of dyslipidemic individuals among the study population amounted to 67%, thus showing a positive correlation between dyslipidemia and stroke among patients in the Rural Maharashtra population under study. The pattern of dyslipidemia showed that 28% of the patients with abnormal lipid profiles had an elevated serum total cholesterol while only 14% had elevated triglycerides. Surprisingly, only 6% of the dyslipidemic patients had elevated LDL which is usually implicated in atherosclerosis while 47% of the individuals had low HDL.

When this data was compared to the data obtained from other studies done on lipid profile in stroke, it was found that the results do not correlate. The study on dyslipidemia in stroke patients done in Pakistan, showed that 32% of the study population had high total cholesterol and 24% had high triglycerides. Though the serum total cholesterol frequency among both the population correlate, our study population in Rural Maharashtra showed only a small percentage of patients with hypertriglyceridemia (14%) in comparison to the study done in Pakistan[15] where 24% of the study population had hypertriglyceridemia.

Further, our study showed that only 6% of the dyslipidemic patients had elevated LDL in contrast to 26% of the patients having elevated LDL in the Pakistani study. Low HDL levels were also more frequently implicated among our stroke patients (47%) than in the Pakistani study population(18%) .

ISSN: 0975-8585

CONCLUSION

This study showed an association of 67% between dyslipidemia and stroke.These findings are consistent with other similar studies done in Bahrain, Manhattan and Pakistan. They show a definite relationship between dyslipidemia and stroke. The occurrence of the underlying co-morbities of hypertension and diabetes also corroborated with the above mentioned studies.

Most of the the patients were having Low LDL level (47%) which is a risk factor for stroke

REFERENCES

[1] Dalal PM. Ischemic cerebrovascular diseases. In: Dalal PM, eds. API Text book of Medicine. 9th ed. New Delhi: The Association of Physicians of India, Jaypee Brothers Medical Publishers (P) Ltd; 2012: 1401-1410.

[2] Anthony S. Kim N, S. Claiborne Johnston. Neurologic complications of hypertension. In: Anthony S. Kim N, S. Claiborne Johnston, eds. Aminoff's Neurology and General Medicine. 2nd ed. USA: Academic Press; 1996: 1216.

[3] Sacco RL, Kargman DE, Gu Q, Zamanillo MC. Race-ethnicity and determinants of intracranial atherosclerotic cerebral infarction. Northern Manhattan Stroke Study. Stroke. 1995;26:14.

[4] Central Bureau of Health Intelligence. National Health Profile. New Delhi: Directorate General of Health Sciences; 2008: 102.

[5] World Health Organization. Workshop Report on Stroke Surveillance in India. Geneva: WHO; June 2012.

[6] Gotto AM. Some reflections on arteriosclerosis: past, present, and future. Circulation. 1985;72:8-17.

[7] Allan H. Ropper, Martin A. Sameuls, Joshua P. Klien. Cerebrovascular diseases. In: Allan H. Ropper, Martin A. Sameuls, Joshua P. Klien, eds. Adams and Victor's Principles of Neurology. 10th ed. New York, NY: McGraw-Hill Education; 2014: 779-895.

[8] Wade S. Smith, Joey D. English, S. Claiborne Johnston. Cerebrovascular diseases. In: Wade S. Smith, Joey D. English, S. Claiborne Johnston, eds. Harrison's Principles of Internal edicine 8th ed New York, NY: McGraw-Hill Professional; 2011: 3270-3299.

[9] Wild SH, Byrne CD, et al. Metabolic syndrome, haemostatic and inflammatory markers, cerebrovascular and peripheral arterial disease: The Edinburgh Artery Study. Atherosclerosis. 2009;203:604-9. 10.

[10] Rodriguez-Colon SM, Mo J, Duan Y, et al. Metabolic syndrome clusters and the risk of incident stroke: the atherosclerosis risk in communities (ARIC) study. Stroke. 2009;40:200-205.

[11] Jia L, Bai H, Fu M, Xu Y, Yang Y, Long S. Relationship between plasma HDL subclasses distribution and apoA-I gene polymorphisms. Clin Chim Acta. 2005;360:37-45.

[12] Konstantinov IE, Mejevoi N, Anichkov NM. Tex Heart Inst J. 2006; 33(4): 417–423.

[13] Al-Jishi AA, Pochiraju KM. Profile of stroke in Bahrain. Neurosiences 2000; Vol. 5 (1): 30-34.

[14] Willey JZ; Qiang X, Albala BB, Myunghee CP, Moon YP, Sacco RL, Elkind MSV. Lipid profile components and risk of stroke-A Northern Manhattan study. Arch Neurol. 2009;66(11):1400-1406.

[15] Baluch UT, Kiani I, Zaib-un-nisa ,Badshah M. Association of dyslipidemia and ischemic stroke. Ann. Pak. Inst. Med. Sci. 2008;4(3): 165-167.