



EVALUATION OF LIPID PROFILE IN YOUNG ADULT STROKE PATIENT AT M Y HOSPITAL INDORE, MADHYA PRADESH

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ABSTRACT

Introduction: Stroke is classically characterized as a neurological deficit attributed to an acute focal injury of the central nervous system due to impairment of cerebral circulation, resulting in abnormal perfusion of brain causing acute neurological deficit. Diabetes mellitus and dyslipidaemia, along with hypertension and smoking are the leading risk factors for the occurrence of stroke. It is most common in elderly patients, but stroke can occur at any age, including childhood. There are many risk factors found to be associated with the stroke but role of lipid abnormality as major risk factor is consistently observed. **Aim & Objectives:** To evaluate lipid profile status in young patients suffering from stroke and its relationship with etiology of stroke. **Material & Methods:** This prospective clinical study was conducted in M Y Hospital, Indore in the young (15-45 years) patients suffering from stroke attended the medicine department. The total 50 patients were included in the study after informed consent. Complete lipid profile was evaluated using serum sample of patients by standard enzymatic methods in the central lab of hospital. **Results & Observations:** Total cholesterol, Triglycerides, HDL, LDL were found abnormal in 28,16%,82%,62% subjects presented with stroke. Out of these patients presented with abnormal lipid status the percentage of ischaemic stroke was 13%,7%,32%,27% respectively and haemorrhagic stroke was observed in 01%, 01%,09%, 04% respectively. **Conclusions:** Our study concluded that relation of dyslipidaemia with ischaemic and haemorrhagic stroke patients isn't consistent and more related to ischaemic stroke as compared to haemorrhagic stroke.

KEYWORDS : Stroke, Dyslipidaemia, Ischaemic stroke, Haemorrhagic stroke

INTRODUCTION

Stroke is classically characterized as a neurological deficit attributed to an acute focal injury of the central nervous system due to impairment of cerebral circulation, resulting in abnormal perfusion of brain causing acute neurological deficit. Blood supply may be impaired by cerebral infarction, intracerebral hemorrhage and subarachnoid hemorrhage. There are two types of stroke. First is an Ischemic stroke (87%) which may occur due to obstruction of arteries by thrombus or embolus while hemorrhagic strokes are caused by rupture of artery.[1]

Stroke is a major cause of disability and third leading cause of death worldwide. According to the World Health Organization (WHO), stroke is the second leading cause of death for people above the age of 60 years, and the fifth leading cause in people aged 15 to 59 years old. [2] There are 15 million people worldwide who suffer a stroke each year. Each year, nearly six million people worldwide die from stroke. One in six people worldwide will have a stroke in their lifetime. Every six seconds, stroke kills some. Stroke claims more than twice as many lives as AIDS. [3]

In high income countries, the incidence of stroke is 217 per 100,000 person-years and the prevalence is 715 per 100,000 people, compared with low income countries where the incidence is 281 per 100,000 person-years and the prevalence is 393 per 100,000 people. [4]

Stroke rates in middle-aged people are five to ten times higher in Pakistan, India, Russia, China, and Brazil, compared with the United Kingdom or United States. South Asia is home to 20% of the world's population and has one of the highest burdens of cardiovascular disease in the world. [5]

It is more frequently found in third world countries. About 20% of the world's population lives in South Asia and stroke is 5-10 times more frequent in South Asia than USA and UK. Contrary

to decline in the incidence of the disease in the Western population, the burden of the disease in South Asian countries (India, Pakistan, Bangladesh, and Sri Lanka) has inclined and is expected to rise [1]

Intra cerebral haemorrhage is the most common type of intracranial haemorrhage. It accounts for 10% of all strokes and is associated with a 50% case fatality rate. Incidence rates are particularly high in Asians and blacks. [6]

The prevalence of stroke in India shows a huge variation of 147-922/100,000 across diverse community-based studies. According to the India stroke factsheet updated in 2012, the estimated age-adjusted prevalence rate for stroke ranges between 84/100,000 and 262/100,000 in rural and between 334/100,000 and 424/100,000 in urban areas. [7]

According to Madhya Pradesh: Disease Burden Profile, 1990 to 2016 stroke was ranked fifth among the fifteen leading cause for the most years of life lost and 8th leading cause of DALYs in both sexes. In 1990 stroke was at thirteenth position which is now stepped up to 8th position in terms of DALYs. [8]

Diabetes mellitus and dyslipidaemia, along with hypertension and smoking are the leading risk factors for the occurrence of stroke. It is most common in elderly patients, but stroke can occur at any age, including childhood. [9].

There are many risk factors found to be associated with the stroke but role of lipid abnormality as major risk factor is consistently observed in many studies. [1] [4] [6] [10] [11].

Various abnormalities in lipid profile have been reported in young patients with stroke. Both hypercholesterolemia and hypertriglyceridemia appear to be important risk factors for atherosclerosis. Low HDL cholesterol levels are commonly associated with other lipid and apolipoproteins abnormalities causing stroke.[12]

The relationship between lipids and stroke is complex. In most epidemiological cohorts, there is a direct relationship between cholesterol levels and ischemic stroke. The relationship of lipids to ischemic stroke, however, varies by stroke subtype, with associations strongest for atherosclerotic subtypes. Conversely, there is an increased risk of intracerebral hemorrhage (ICH) at low cholesterol levels, and there is evidence that small vessel disease may share a similar profile of inverse association with lipid levels [13].

Looking at the ambiguity between lipid level and its relationship with the type of stroke, this study was carried out to evaluate the association between dyslipidaemia and stroke in patients who presented to M Y hospital, Indore, M.P

AIM & OBJECTIVES: To evaluate lipid profile status in young patients suffering from stroke and its relationship with etiology of stroke.

MATERIAL & METHODS

This prospective clinical study was conducted in M Y Hospital, Indore in the young (15-45 years) patients suffering from stroke attended the medicine department. After complete physical and clinical examination and investigation reports, those patients who had fulfilled the inclusion and exclusion criteria were included in the study. The total 50 patients were included in the study after informed consent. Patients of both type (ischaemic and haemorrhagic) were included in the study. Complete lipid profile was evaluated using serum sample of patients by standard enzymatic methods in the central lab of hospital. ATP III classification was followed for dyslipidaemia (Table 1) Patients with brain tumour, head injury, transient ischaemic attack, syncope attacks and presumptive diagnosis of stroke with no evidence on CT were excluded from the study. Results were expressed in percentage, mean and standard deviation. Data were analyzed using Microsoft excel software with windows 7 platform.

OBSERVATION & RESULTS

In our study only patients belonging to age group 18 to 45 were included. There were total 21 female and 29 males. Maximum number of female patients were age group of 21-25 while maximum male patients were age group of 36-40. Only one female and two males were of less than 20 years of age.

Table-1: ATP III guidelines

LDLc		Total cholesterol		HDLc	
<100	Optimal	< 200	Desirable	< 40	Low
100-129	Near optimal	200-239	Borderline high	≥ 60	High
130-159	Borderline high	≥ 240	High		
160-189	High				
>190	Very High				

Table-2: Lipid profile in all patients

Parameter	Mean	Std.Dev.
Cholesterol (mg%)	172.94	50.31
Triglycerides (mg%)	130.88	33.02
High Density Lipid (mg%)	35.52	8.08
Low Density Lipid (mg%)	115.568	42.89

Table-3: Lipid profile associated with stroke

Lipid (N=50)	Normal		Abnormal	
	Normal	Abnormal	Normal (%)	Abnormal (%)
Total cholesterol (<200)	36	14	72	28
Triglycerides (<150)	42	08	84	16
HDL (M>40; F>50)	9	41	18	82
LDL (<100)	19	31	38	62

Table-4: Lipid profile associated with type of Stroke

Lipid (N=50)	Normal	Type of Stroke		Abnormal	Type of Stroke	
		Ischaemic (N=39)	ICH (N=11)		Ischaemic (N=39)	ICH (N=11)
Total cholesterol (<200)	36	28	08	14	13	01
Triglycerides (<150)	42	32	10	08	07	01
HDL (M>40; F>50)	9	7	2	41	32	09
LDL (<100)	19	12	07	31	27	04

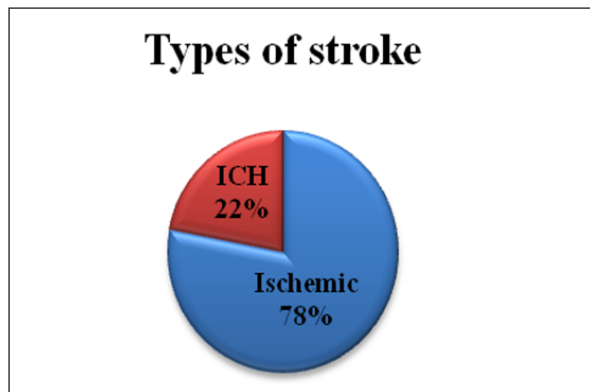


Fig.1 Percentage of types of stroke out of total patients

DISCUSSION

This study was conducted in young individuals of both sexes suffering from strokes for one year at M Y Hospital, Indore M. P. Patients suffering from both type of strokes (Ischaemic and haemorrhagic) were included in the study. Stroke is a very common pathological condition leading to morbidity and mortality at large scale. Contrary to decline in the incidence of the disease in the Western population, the burden of the disease in South Asian countries (India, Pakistan, Bangladesh, and Sri Lanka) has inclined and is expected to rise.

Conflicting reports have been published about the significance of hyperlipidemia in the development of cerebrovascular disease. Some investigators, who have examined survivors of attacks of ischemic cerebrovascular disease, have observed elevated mean concentrations of serum cholesterol and/or triglyceride [14]

In our study most of the patients were between 19 to 45 years of age group. Maximum number of female patients were age group of 21-25 while maximum male patients were age group of 36-40 years. Only one female and two males were of less than 20 years of age.

A study conducted by Albuther J F et al [12] in 94 patient suffering from Ischaemic stroke, patients were from age 15 to 45 years. Out of 94 patients, 55 were males while 39 were females with mean age 35.8 ± 8.2 years). In another study by Nirmala A C et al [15] the youngest patient in the study was 18 years and the eldest was 44 years old. Maximum number of patients (53.33%) was more than 37 years age and less than 45 yrs group. Mean age with standard deviation was 35.23 ± 7.37.

In our study total cholesterol were normal in 36 patients while abnormal in 14 patients. In 36 patients having normal total cholesterol level 28 were having ischaemic stroke while 8 were having hemorrhagic stroke. Out of 14 patients having abnormal total cholesterol 13 were having ischaemic etiology while only one were having hemorrhagic etiology. In our study

36 patients were having cholesterol level less than 200 mg% while 14 patients were having cholesterol level more than 200 mg%. A study by Weir C J et al [16] concluded that serum cholesterol level is not an independent predictor for outcomes after stroke.

In our study triglycerides level were normal in 42 patients while abnormal in 08 patients. In 42 patients having normal triglycerides level 32 were having ischaemic stroke while 10 were having hemorrhagic stroke. Out of 08 patients having abnormal total cholesterol 07 were having ischaemic etiology while only one was having hemorrhagic etiology. In our study 42 patients were having triglycerides level less than 150 mg% while 08 patients were having cholesterol level more than 150 mg%.

In our study HDL level were normal in 09 patients while abnormal in 41 patients. In 09 patients having normal HDL level 07 were having ischaemic stroke while 02 were having hemorrhagic stroke. Out of 41 patients having abnormal HDL 32 were having ischaemic etiology while 09 were having hemorrhagic etiology. In our study 09 patients were having HDL level more than 40 while 41 patients were having HDL level less than 40.

In our study LDL level were normal in 19 patients while abnormal in 31 patients. In 19 patients having normal LDL level 12 were having ischaemic stroke while 07 were having hemorrhagic stroke. Out of 31 patients having abnormal LDL, 27 were having ischaemic etiology while 04 were having hemorrhagic etiology. In our study 19 patients were having LDL level less than 100mg% while 31 patients were having LDL level more than 100mg%. Another study conducted by Das P et al in 36 stroke patients of 27-49 years of age concluded that dyslipidemia was significantly associated with stroke. [17] Similarly a study by Synthia A et al (11) concluded that there was a significant association of 56% between dyslipidaemia and stroke while a study by Siddeshwari et al [6] concluded that dyslipidaemia were present only in 14% patients but all the patients were more than 40 years of age while we have conducted this study in young adults (18-45 years). In one study conducted in Northern India by Rai O N [18] concluded that abnormal lipid values were found in 54 patients (Total 100). Total cholesterol was abnormal in 83% of ischemic stroke and 17% of hemorrhagic stroke. LDL cholesterol was abnormal in 86% of ischemic stroke and 14% of hemorrhagic stroke. Similar findings were observed in our study where 13 out of 14 patients having abnormal total cholesterol were having ischaemic stroke and 27 patients out of 31 having abnormal LDL cholesterol have suffered from ischaemic stroke.

In this study frequency of ischemic stroke patient was 78% while of hemorrhagic stroke was 22% which is comparable with a study by Khan S N et al [19] who also noted that 70.1% patients suffered from Ischemic stroke & 29.9 % from hemorrhagic stroke. In our study it was observed that total cholesterol and triglycerides level were normal in 72% and 84% patients respectively.

Our study showed a high occurrence of dyslipidaemia in the form of elevated LDL and decreased HDL. Mehndiratta MM et al [2] showed abnormal cholesterol and triglycerides levels as a risk factor.

CONCLUSIONS

Our study concluded that relation of dyslipidaemia with ischaemic and haemorrhagic stroke patients isn't consistent and more related to ischaemic stroke as compared to haemorrhagic stroke.

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