CASE REPORT

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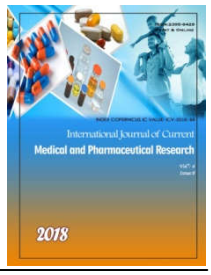

OCCLUSIVE STROKE IN YOUNG POPULATION: A TERTIARY CENTRE EXPERIENCE

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ABSTRACT

Introduction: Stroke or cerebro-vascular accidents cause a considerable mortality and morbidity in the people of middle and past middle age in both developed as well as developing countries. The occlusive cerebrovascular disease in young could be due to premature atherosclerosis or hypercoagulable state. In young adults, role of lipids in causation of stroke had been suggested.
Material and methods: The present study was conducted at Government Medical College Jammu on patients of hemorrhagic stroke, Inclusion criteria were: Age 15 to 40 years, Both sexes including pregnant females were included in the study, Diagnosis of stroke was established when Patient had a focal/generalized neurological deficit lasting for 24hours and confirmed by physical finding and computed tomography to be of vascular origin.
Results: Among 18 patients of Occlusive stroke 8 patients i.e. 44-.44 % were male patients and 10 patients i.e. 55.55% were females, where as among the control groups 35 patients (70%) were male and fifteen (30%) were females. Our patients of Occlusive stroke belonged to the age group of 26 to 40 years. We found statistically significantly higher value of serum cholesterol, triglyceride, LDL-cholesterol in young patients with occlusive stroke. Regarding HDL cholesterol we observed a significantly lower value of HDL-cholesterol in our patients

INTRODUCTION

Stroke or cerebro-vascular accidents cause a considerable mortality and morbidity in the people of middle and past middle age in both developed as well as developing countries [1]. The prevalence of stroke in elderly in developing and developed nations is not different and is attributed to increase in incidence of hypertension and atherosclerosis and with advancing age [2]. Crude prevalence of stroke from India is around 200/100,000 population [3]. Prabhakar *et al* (1999) [4], reported a high incidence of stroke in young. High incidence of stroke in young has been reported from Spain [5]. Salt Lake City [6], Italy [7] and Saudi Arabia [8]. In rural Kashmir prevalence of stroke in age group of 15- 39 years was 41 per 100,000 populations [9].

The occlusive cerebrovascular disease in young could be due to premature atherosclerosis or hypercoagulable state. Risk factors like polycythemia, leukemia, macroglobulinemia, and collagenosis although cause vasculitis and vascular occlusion, but they were not important risk factors in a large study [10].

Embolic stroke is another important cause of stroke in young accounting for 10 to 15% of such cases. The majority of emboli enter circumferential arteries. Majority of emboli are from heart (79%) to rheumatic heart disease and infective endocarditis [11]

Nikolai Anickov first of all proposed a link between cholesterol and atherosclerosis in 1912 [12]. Decades later observational studies have established dyslipidaemia as an independent risk factor for coronary artery disease. However, because of heterogeneous nature of stroke, the link between hyperlipidemia and stoke was more difficult to establish [13]. MRFIT and various studies in 1990s showed a positive relationship between thromboembolic stroke and serum cholesterol [14].

In young adults, role of lipids in causation of stroke had been suggested. Chopra and prabhakar (1979) and Chopra *et al* (1980) reported statistically significant increase in serum cholesterol, LDL- Cholesterol and triglycerides in young male with stroke. Female patient with stroke have only high cholesterol values. Yatsu and Loch (1982) observed increased serum triglycerides and significant reduction in HDL in persons having ischemic stokes and were less than 55 year of age. Low level of HDL has also been confirmed by Venkataraman *et al* (1971) and Vijayan (1988).

Puerperal cerebral venous thrombosis in an important cause of young stoke in India accounting for 15-20% of such cases. A

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variety of lipid changes have been described in this disorder. Bansal *et al* (1974) demonstrated rise in serum triglyceride, phospholipids, and free fatty acid along with fall in fibrinolytic activity. Chopra *et al* (1979) observed a significant increase in triglyceride and beta-lipoproteins but cholesterol values were normal [15].

MATERIAL AND METHODS

The present study was conducted in young patients of stroke who were diagnosed as embolic/thrombotic Stroke on imaging at government medical college Jammu. Occlusive stroke was established when he, she had a focal or generalized neurological deficit lasting for 24 hours and was confirmed by physical finding and computed tomography to be of vascular origin

Inclusion criteria

Age 15 to 40 years
Both sexes including pregnant females were included in the study
Diagnosis of embolic occlusion was indicated by the following phenomenon

- Symptoms have developed suddenly within seconds or few minutes
- Absence of prodromal manifestation
- Relative presence of consciousness
- Rapid improvement at times
- Focal neurologic signs or special arterial syndrome
- A source of embolism usually exists in heart (either cardiac arrhythmia or infarction)
- Evidence of recent embolism in other organs e.g. spleen, kidney, extremities, intestines, lungs etc.
- Diagnosis of thrombotic occlusion was indicated by the following phenomenon
- Recurrent cerebral ischemic attacks often with recovery
- Gradual onset
- Relative presence of consciousness
- Rapid improvement at times
- Certain constellation of symptoms and signs e.g. lateral medullary syndrome
- The presence of disorder commonly associated with atherosclerosis (hypertension, diabetes mellitus, atheromatosis)
- Evidence of atherosclerosis elsewhere especially coronary, peripheral vessels and aorta

A non contrast CECT scan of head was taken in all patients.

The controls

Healthy volunteer < 40years of age of both sexes without any evidence of stroke/ TIA, without any family history of hyperlipidemia, any history of chronic liver disease, chronic renal disease, hypothyroidism were selected to provide control. The subjects were registered after informed consent and eligibility criteria were ascertained. A detailed medical history was obtained from each subject including quantitative information about important risk factors. Routine workup of the subjects was done in hospital wards.

In all patients, the fasting peripheral venous blood sample (5ml) was taken from each patient using disposable syringe and put in a chemistry tube. After allowing the sample to clot at room temperature for two hours, serum was separated by centrifugation at 1500xg for 15 minutes at 4 degree Celsius and put into separate vials for storage at 70 degree Celsius (for up to one week)
Commercially available kits from Randox UK were used for estimation of total lipids, cholesterol, LDL Cholesterol and triglycerides.

The data analysis

In addition to descriptive statistics, the t Test was used to compare between the means of continuous variables.

Observations

Table no 1 Showing Sex distribution of patients and controls

	Occlusive stroke	Control
Males	8(44.44%)	35(70%)
Females	10(55.55%)	15(30%)
Total	18	50

Among 18 patients of Occlusive stroke 8 patients i.e. 44-.44 % were male patients and 10 patients i.e. 55.55% were females, where as among the control groups 35 patients (70%) were male and fifteen (30%) were females.

Table no 2 Showing Age wise representation of patients and controls

Age group	Occlusive stroke		Control	
	Male	Females	Males	Females
16-20 yrs	0	0	1(2%)	0
21-25 yrs	0	0	2(4%)	1(2%)
26-30 yrs	0	3 (16.66%)	13(26%)	6(12%)
31-35 yrs	0	1(5.55%)	12(24%)	1(2%)
36-40 years	8 (44.44%)	6 (33.33%)	7(14%)	7(14%)
Total	8(44.44%)	10(55.55%)	35(70%)	15(30%)

Our patients of Occlusive stroke belonged to the age group of 26 to 40 years, Where as our controls belonged to age group of 16 to 40 years. All male patients 8 out of 8 belonged to age group of 36 to 40 years whereas maximum female patients 6 out of 18 belonged to age group of 36 to 40 years. None of these findings was statistically significant.

Table no 3 Mode of presentation in patients

	Characteristics	Patients
1	History of TIA	8(44.44%)
2	Motor deficit	6(33.33%)
3	Alteration of of sensorium	5(27.70%)
4	Sphincter incontinence	3(16.66%)
5	Cardiac enlargement	8(44.44%)
6	ECG abnormalities	16(88.88%)

In our study 16 i.e. 88.8 % of patients had subnormal ECG. 44.44 % patients i.e. 8 out of 18 patients had history of TIA, and similar number of patients had Cardiomegaly on chest x ray. Sphincter incontinence was present in only 16.66 % patients (3out of 18).

Table no 4 Lipid profile of occlusive versus control

	Occlusive (n=18)	Control (n=50)	T value	P value	Remarks
Serum Cholesterol (mg/dl)					
Range	89-316	69-209	2.726	<0.05	Sig
Mean +/- SD	164.11+/- 54.79	130.02+/- 41.80			
VLDL Cholesterol (mg/dl)					
Range	24-89	14-93	.834	>0.05	NS
Mean +/- SD	58.50+/-20.00	54.36+/-17.35			
LDL cholesterol					

(mg/dl)					
Range	57-.226	29-120	10.227	<0.001	Sig.
Mean +/- SD	137.83+/-46.07	81.24+/-20.83			
HDL cholesterol (mg/dl)					
Range	22-56	26-98	3.096	<0.001	Sig
Mean +/- SD	37.61+/-9.65	53.76+/-21.27			
Triglycerides (mg/dl)					
Range	107-430	66-246	5.366	<0.001	Sig
Mean +/- SD	222.22+/-87.39	132.72+/-48.06			
Total lipids (mg/dl)					
Range	380-1200	390-720	2.300	<0.001	Sig
Mean +/- SD	627.94+/-210.64	550.28+/-70.27			

DISCUSSION

Dyslipoproteinemia has unequivocally been associated with genesis of ischemic heart disease and atherosclerotic peripheral vascular disease [13, 16, 17]. Its role in genesis of strokes or transient ischemic attack remains unclear because of conflicting information in literature. Methodological flows have been partly responsible for the ambiguity of results. Unlike ischemic heart disease, stroke is clinically a more heterogeneous syndrome. Studies done in era before computed tomography were likely to include patients with cerebral haemorrhage as well as infarction, Although more recent studies have separated haemorrhage from infarction, the population of patients with stroke has remained heterogeneous, particularly since cardio embolic and athero-thrombolic stroke have been grouped together, although the two processes are not identical[80]. Spectrum of etiologies of cerebrovascular accident in young adults is different from older patient and dyslipidemia have been implicated in etiopathogenesis of cerebrovascular accidents. The present study in our institute adds credence to this concept.

Rossner *et al* [18] studied Dyslipoproteinemia in patients with ischemic cerebrovascular accidents and found that although HDL-Cholesterol was 18% lower in control group but there was no significant correlation. Chopra and Parbhakar (1979) and Chopra *et al* (1980) reported significantly higher values of serum cholesterol, LDL Cholesterol, triglycerides in patients of ischemic stroke Yatsu and Loch [19] observed a significant increase in triglyceride and significant reduction in HDL – Cholesterol in young ischemic stroke patients. Chen *et al* [20] studied relationship between lipoprotein profile and large cerebral artery atherosclerosis in young adults of developing Asian countries. They found a significant elevation of serum cholesterol, triglyceride, total lipids, B Lipoprotein and Pre – beta lipoprotein in atherosclerotic cerebral infarct patients.

We found statistically significantly higher value of serum cholesterol, triglyceride, LDL- cholesterol as observed by Chopra and Parbhakar, Chopra and Chen *et al*. as in vitro and animal studied have confirmed that modification of LDL-particle e.g. oxidation, makes them more susceptible to uptake by receptor on macrophage that initiate development of fatty streaks and atherosclerotic plaque. Atherosclerosis over age of 35 years is well known but nothing much is known about premature atherosclerosis except in those related to genetically determined factors (familial clustering), nutritional factors and environmental factors, and as such is still open to debate. Thus the results of our study were consistent with aforementioned observation in ischemic stroke patient.

Regarding HDL cholesterol our observation were consistent with observation by Rossner *et al*, Yatsu and loch, Venkatramam, Vijayan, Albuchar *et al*, who observed a significantly lower value of HDL-cholesterol.

On comparing the lipid parameters among intracerebral haemorrhage and ischemic group revealed a statistically significant difference (<0.001) in serum cholesterol being lower in patients of intracerebral hemorrhage, while the difference in other parameter was statistically insignificant (p>1.15).

Jacob and Iso have postulated that level of lipid at time of stroke are better representative of lipid levels because poor nutrition or newly developed liver and renal dysfunction after stroke may result in lower lipid levels later on. Also the lipid level measurements at onset of stroke have an advantage of including both fatal and non-fatal stroke. [21]

Our study has a limitation in the sense that we had only 18 patients to compare with 50 controls; so a randomized controlled study is required to identify the role of lipids in various subgroups of patients of occlusive stroke. There is also ambiguity about the timing of estimation of lipid levels. Therefore, it seems likely dyslipidemia is an important risk factor in etiology of occlusive stroke. Comprehensive preventive and/or therapeutic strategies could then be developed for primary and secondary prevention of occlusive stroke.

SUMMARY AND CONCLUSIONS

The present study reiterates the important of dyslipidemia in occlusive stroke involving young adults. The cause and effect relationship between dyslipidemia and occlusive stroke in young adults has not been established as yet, the following inference may be safety drawn. High levels of LDL-cholesterol, triglyceride and total lipids are found in patients with occlusive stroke. The lipid peroxides favors the initiation of atherosclerotic lesions and ultimate progression to plaque and occlusive stroke.

HDL-cholesterol has an inverse relation with occlusive stroke. As atherosclerosis over age of 35 years is known, but cause of premature atherosclerosis is still not determined which occur in young adults. Low level of HDL-cholesterol is strongly associated with stroke risk in patients without any evidence of atherosclerosis.

In patients of occlusive stroke there is an excess of cholesterol, LDL-cholesterol, triglyceride and total lipid while there are low levels HDL-cholesterol. We should always send lipid profile in all patients of occlusive stroke and especially those with age less than 40 yrs.

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