

Association of Diabetes with Hyperlipidemia in Stroke Patients at Tertiary Care Centre

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Abstract: Stroke is defined as abrupt onset of neurological deficit that is attributable to focal vascular cause. Elevated levels of lipid are well documented risk for stroke. In this study, we investigated the association between Diabetes Mellitus and Hyperlipidaemia in Stroke patients in Tertiary Care Centre. Total 130 patients of stroke included in hospital based cross sectional study in Department of Medicine from October 2018 to March 2020. All stroke patients diagnosed based on CT scan/ MRI- Brain, reviewed by neurologist. It is found that proportion of Diabetes among Hyperlipidemic Stroke cases were 23.07% and Non- Diabetic cases were 40%. Proportion of Diabetes was statistically not significant in Hyperlipidemic stroke cases ($p < 0.05$).

Keywords: stroke, lipid profile

1. Introduction

Stroke is abrupt onset of neurologic deficit that is attributable to focal vascular cause and second leading cause worldwide [1]. Stroke is caused by interruption of blood supply to brain, this cuts off the supply of oxygen and nutrients causing damage and ischemia to brain tissue [2, 3]. Symptom is sudden weakness of arm, leg mostly on one side of body and numbness of face which is focal neurological deficit. Other symptoms may be confusion, difficulty in speaking, understanding speech, difficulty in walking, loss of balance, co-ordination, headache [4].

Hyperlipidemia is important risk factor for stroke due to atherosclerosis of extracranial and intracranial blood vessels [5]. It is defined as disorder of lipoprotein metabolism including lipoprotein overproduction or deficiency. High LDL and low HDL has great risk [6, 7].

Diabetes Mellitus- several studies showed that Diabetes is central risk factor for ischaemic stroke but relationship between blood glucose levels and stroke risk is less certain. Berger and Hakim suggested that hyperglycemia patients develop more pronounced cerebral oedema and worsening clinical outcome after having stroke. Undoubtedly, hyperlipidemia and Diabetes are two of the common disorders all over the world, so aim of this study is to find out association of Diabetes and Hyperlipidemia in stroke patients.

2. Material and Methodology

A hospital based cross sectional study in the Department of Medicine in tertiary care hospital for period 2 years from March 2018 to March 2020. The study was conducted after formal approval of institutional ethics committee. Patients without confirmed CT/MRI reports, TIA, refused to give

blood samples, refused to participate in the study are excluded. Patients with confirmed CT/MRI reports admitted in Tertiary Care centre included in this study. Sample size of 130 patients are included. All patients who are included in study background data (age, gender and social status) past medical history (HTN, DM, AF, IHD, TIA, previous history of stroke) other risk factors

Inclusion criteria

- 1) Patient having age more than 18 years of both sexes with stroke
- 2) All confirmed stroke cases admitted in tertiary care centre

Exclusion criteria

- 1) Patient already on anti-dyslipidaemia drug
- 2) Patient having stroke due to trauma
- 3) Patient in whom CT/MRI could not be obtained
- 4) Stroke due to vasculitis
- 5) Stroke patients less than 18 years
- 6) Patient not willing to participate

Fasting venous blood sample collected from patients to measure lipid profile, fasting blood glucose and HbA1c level. Hyperlipidemia is defined as cholesterol level equal to or more than 200mg/dl, LDL more than or equal to 130 mg/dl, HDL less than 40mg/dl in male and 50mg/dl in females [9]. Patients were diagnosed as Diabetic if fasting glucose level equal to or more than 126mg/dl or random blood glucose more than 200mg/dl on more than once occasion with symptoms of hyperglycemia or HbA1c level equal to or more than 6.5% [10]. Patient who are on anti-diabetic medications considered as Diabetic.

3. Results / Discussion

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S. No.	Diabetes	Hyperlipidemia				Total
		Present	%	Absent	%	
1.	Present	30	23.07	13	10	43(100)
2.	Absent	52	40	35	26.92	87(100)
	Total	82	63.07	48	36.93	130(100)

Chi-square- 0.843, df-1, p-0.358

The proportion of Diabetes among hyperlipidemia stroke cases was 23.07% and Non diabetic cases was 40%.

When statistical analysis using Chi-square test was done, proportion of Diabetes was statistically not significant in hyperlipidemic stroke cases ($p < 0.05$).

The results suggest that it may be that the greatest effects of hyperglycemia on stroke risk accumulate early in the course of the disease and in the pre-diabetes stage, rather than late in the course when co-morbid cardiovascular risk factors are more likely to be present. This notion is supported by a recent randomized controlled trial of pioglitazone used after stroke or TIA in those with pre-diabetes [11].

The relationship between dyslipidemia and stroke risk is complex, with an increased risk for ischemic stroke with increased total cholesterol, and a decreased risk for ischemic stroke with elevated HDL cholesterol [12].

4. Conclusion

The proportion of Diabetes among hyperlipidemia stroke cases was 23.07% and Non diabetic cases was 40% When statistical analysis using Chi-square test was done, proportion of Diabetes was statistically not significant in hyperlipidemic stroke cases ($p < 0.05$).

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