

Lipid profile and carotid Doppler findings in ischemic stroke in Nepalese Population

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ABSTRACT

INTRODUCTION: Stroke is a common cause of death in the developed world and is the most common cause of severe physical disability. Risk factors for stroke are hypertension, diabetes, dyslipidemia etc. Ultrasound of carotid artery is important in the assessment and management of ischemic stroke patients. There are few studies of stroke in Nepal.

METHODS: Data was obtained from cerebrovascular accident (CVA) patients admitted in National Academy of Medical Sciences, Bir Hospital, Kathmandu from 2007 June to 2008 September. Patients with CVA and computer tomography (CT) head findings that were suggestive of infarction were included and those with haemorrhagic stroke, who had not undergone CT scans and carotid Doppler Ultrasonography(USG) for financial or various reasons were not included in the study. Data like age, history of hypertension, diabetes, dyslipidemia, tobacco use was obtained. Blood samples for lipid profile were taken and Carotid Doppler USG were done and data analyzed.

RESULTS: 28 patients were included in the study. Average total cholesterol were more than 200 mg/dl and the average mean Low density cholesterol (LDL) ranged between 100 to 150 mg/dl. 20 patients had dyslipidemia and was significantly associated related with CVA (Chi Square =11.61, Sig. =0.001). Significant carotid obstruction was seen in a total of 14 patients, Dyslipidemia was significantly related with significant carotid stenosis (paired t test =6.67, p<0.01).

CONCLUSION: This study suggests significant association with dyslipidemia, carotid artery stenosis and ischemic strokes in Nepalese people. Further more elaborate studies are required.

KEY WORDS: Stroke, Carotid Doppler, Dyslipidemia

INTRODUCTION

Stroke is a common cause of death in the developed world and is the most common cause of severe physical disability as well.¹⁻² A population based study done in Kolkata, India showed that the crude prevalence rate of stroke was 147/100,000 (age-adjusted prevalence 334/100,000).³

Stroke is abrupt vascular injury to the central nervous system which can be ischemic or haemorrhagic.⁴ Stroke consists of ischemic strokes, intracerebral haemorrhage and subarachnoid haemorrhage out of which cerebral infarction is the commonest.⁵

Ischemic infarction was also the most common type of stroke in a large door to door survey study in India as well.⁶ Ischemic strokes are mostly due to thromboembolic disease arising from atherosclerosis in extracranial arteries such as carotid artery and aortic arch.¹

Hypertension, diabetes, smoking, dyslipidemia etc. are known risk factors for stroke.^{1,7} According to a study lipid abnormalities may not have the same exact role in stroke as compared to the established association with coronary artery disease and this may be due to various mechanisms.⁸

Ultrasound of carotid arterial disease is an important part in the assessment and management of stroke patients.⁹ There are very few studies of stroke in Nepal.

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METHODS

Data was obtained from CVA patients admitted in National Academy of Medical Sciences, Bir Hospital, Kathmandu from 2007 June to 2008 September. Patients admitted with a clinical diagnosis of CVA and CT head findings that were suggestive of infarction were included in the study and those with haemorrhagic stroke were excluded. Those who had not undergone CT scans and carotid Doppler USG for financial or various reasons were not included in the study. A total of 28 patients were enrolled in the study. Relevant data like age, history of hypertension, diabetes, dyslipidemia, use of tobacco was obtained from the patient or patient's caretakers and filled in a performa. Blood samples for lipid profile were drawn after a 12 hour overnight fast. Carotid Doppler ultrasound was performed in these patients. Data obtained was then analyzed.

RESULTS:

Out of 28 patients, left middle cerebral artery (MCA) infarction was seen in 11, right MCA in 8, lacunar infarction in 6 and the CT scan was normal in 3 patients (Fig .1).

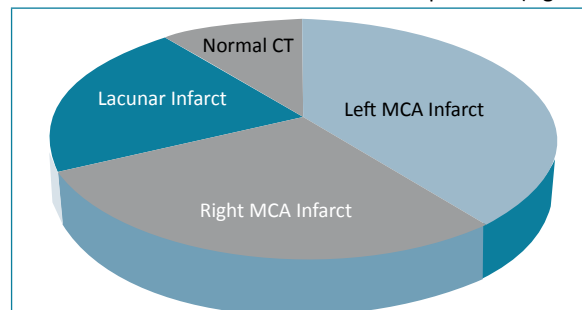


Figure 1. CT Scan Findings

The mean age of all patients in various types of infarction exceeded 60 years and the maximum age was 79 and the minimum was 33 years. The male to female ratio was 1.5:1. The baseline characteristics of the patients in the study are as shown in the Table 1.

Table 1. Baseline characteristics

	Lt.MCA infarction	Rt. MCA Infarction	Lacunar infarction	Normal CT	P value
Number	11	8	6	3	
Male	8	4	3	2	0.7
Female	3	4	3	1	0.45
Mean Age	62	65	61	60	0.06
Smoking / tobacco	3	5	2	1	0.09
Hypertension	5	5	3	2	0.09
Diabetes	3	2	1	2	0.08
Mean Total Cholesterol	223mg/dl	300mg/dl	200mg/dl	210mg/dl	0.03
Mean LDL	130md/dl	150mg/dl	100mg/dl	108mg/dl	0.04
Left Carotid obstruction	5	5	2	2	
Right Carotid obstruction	3	5	3	2	

In this study, average total cholesterol were more than 200 mg/dl and the average mean LDL ranged between 100 to 150 mg/dl in our study. 20 patients had dyslipidemia, out of which 11 had dyslipidemia before the CVA. Dyslipidemia was significantly associated related with CVA (Chi Square =11.61, Sig. =0.001).

Significant carotid obstruction was seen in a total of 14 patients, i.e. half the patients had such obstruction. 7 patients had calcified plaque and 7 patients had age related changes in the carotid Doppler ultrasound. Dyslipidemia was significantly related with significant carotid stenosis (paired t test =6.67, p<0.01).

DISCUSSION

Stroke is a sudden event and can lead to devastating morbidity and even death. Reports have confirmed that hypertension, diabetes and smoking are important risk factors for stroke.¹⁰ In one study the prevalence of hypertension was 59% and diabetes was 44% among stroke patients.¹¹ In our study, 53% of the patient had hypertension and 28 % had diabetes. Meta-analysis of studies have shown that stroke risk is increased by smoking.¹² Our study had 39% patients who smoked or used tobacco.

Studies have shown that evidence elevated levels of total cholesterol, low density lipoprotein are associated with occurrence of arthematous infarctions.¹³ High total cholesterol have been associated with ischemic stroke in patients.^{14,15} In our study, total cholesterol average values were high in all groups of CVA patients. Average LDL was also more than 100 mg/dl in each group of CVA.

Systemic review and meta-analysis have concluded that statin can cause a reduction in LDL leading to reduction in all kinds of stroke.¹⁶ A study by Hadi et al showed that carotid artery stenosis in 56 % of the patients.¹¹ In our study, significant carotid stenosis was seen in half the patients. Evidence from studies suggests that statins used earlier in treatment may lead to better outcomes.¹⁷

The role of statins is essential in the prevention of stroke¹⁸ and also plays an important role in the treatment of patients with carotid stenosis.¹⁹

CONCLUSION

This study suggests significant association with dyslipidemia, carotid artery stenosis and ischemic strokes in Nepalese people. Further more elaborate studies are required.

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