



Importance of Carotid Intima Media Thickness in Ischemic Stroke in a Tertiary Care Hospital

Authors

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Abstract

Background: Stroke is the third commonest cause of death worldwide. As a reflector of systemic atherosclerosis, increased carotid artery IMT has been associated with a higher risk for stroke. **AIMS AND Objectives:** 1. To find the carotid intima media thickness in ischemic stroke patients 2. To find out the correlation between carotid intima media thickness and lipid profile.

Observations and Results: Among 50 patients, 17 had carotid intima medial thickness less than 0.06, 15 had between 0.06 and 0.09. 18 had more than 0.09. Out of 50 cases, 13 cases had died. Among those who died, 6 had CIMT >0.09. 5 had CIMT 0.06 – 0.09. 2 had CIMT <0.06. Among ACA territory infarcts 1 patient had CIMT <0.06. 4 had CIMT 0.06-0.09. 3 had CIMT >0.09. Among MCA territory infarcts 14 patients had CIMT <0.06. 7 had CIMT 0.06-0.09. 8 patients had CIMT >0.09. Among PCA territory infarcts 5 had CIMT <0.06. 4 had CIMT 0.06-0.09. 9 had CIMT >0.09.

Conclusion: it's found to have more CIMT thickness for those having ischemic stroke. Among the 50 patients, 18 people had CIMT >0.09. Also it's found to have, among strokes, posterior cerebral artery strokes had more CIMT (>0.09). Middle cerebral artery territory strokes had more patients with least CIMT (0.06). CIMT also can be used as a prognostic marker of ischemic stroke.

Introduction

Stroke is the third commonest cause of death worldwide. First two causes are coronary heart disease and cancer. In spite of new modalities of treatment poor outcome occurs in stroke in many cases because the outcome is influenced by many factors especially severity of ischemia and its duration. Carotid intima-media thickness (IMT), determined noninvasively by high-resolution ultrasound imaging, has been widely used as an intermediate phenotype for atherosclerosis. As a reflector of systemic atherosclerosis, increased

carotid artery IMT has been associated with a higher risk for stroke.¹

In the Rotterdam Study² and the Cardiovascular Health Study,³ each 1 SD change in IMT increased the incidence of future stroke by approximately 30%, independent of traditional cardiovascular risk factors. In addition, existence of carotid artery plaques was associated with transient ischemic attack (TIA), and the enlargement increased the risk for future neurological events. On the basis of these findings, carotid atherosclerosis, even in the

absence of advanced stenosis, appears to be associated with the risk for stroke.^{4,5}

Aims and Objectives

1. To find the carotid intima media thickness in ischemic stroke patients
2. To find out the correlation between carotid intima media thickness and lipid profile

Method of Study

The study was conducted in SSIMS & RC, Davangere over a period of 1 year from July 2017 to July 2018. The study was a cross sectional study of 50 patients with ischemic stroke. A detailed proforma was filled up for each patient, which included age, sex, IP number, detailed history, past and personal history. A detailed clinical examination was done. Lipid profile and carotid intima media thickness was done for all patients. Data was analysed using spss version 22.

Inclusion Criteria

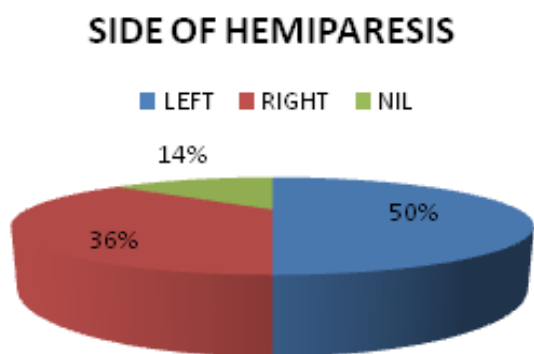
1. Patients with ischemic stroke
2. Patients among age group of 18-80 years

Exclusion Criteria

1. Age more than 80 years and less than 18 years
2. Patients with chronic diseases
3. Vasculitis
4. Inflammatory conditions

Observations and Results

Among 50 patients, 32 were male and 18 were females. 50% had left sided weakness of limbs, 36 % had weakness of right limbs, 14 % didn't had particular limb weakness/ couldn't assess.



Hypertension and Stroke

Hypertension		P value
NO	22	0.161
	44.0%	
YES	28	
	56.0%	
Total	50	
	100.0%	

Among the group with stroke 28 had history of hypertension while 22 didn't had. In the non stroke group, 21 had hypertension and 29 didn't have. The relationship between hypertension and stroke was not found to be statistically significant with p value of 0.161.

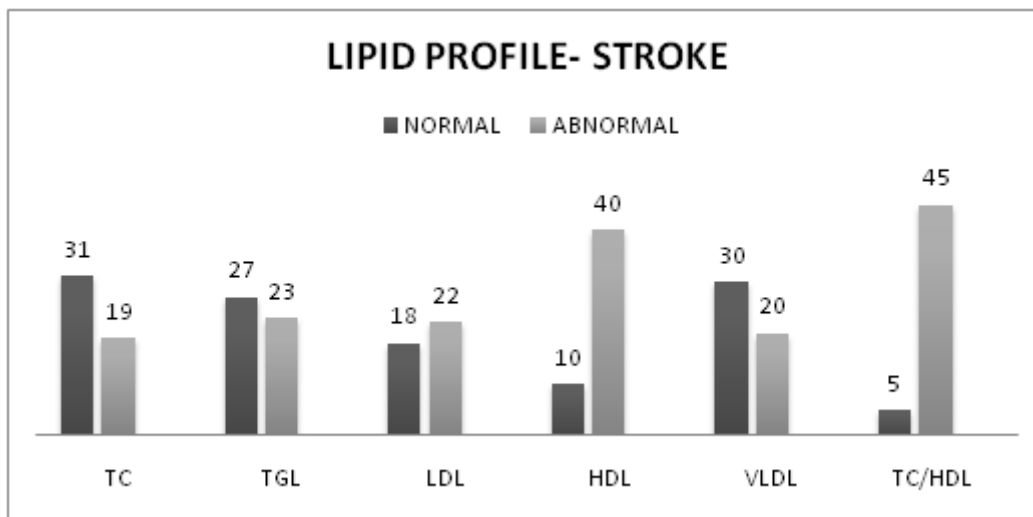
Diabetes and Stroke

Diabetes		P value
NO	26	0.224
	52.0%	
YES	24	
	48.0%	
Total	50	
	100.0%	

Diabetics were found to be 24 among 50 patients with stroke. And 18 among the 50 people without stroke. The relationship between diabetes and ischemic stroke was also found statistically insignificant with p value 0.2.

Lipid Profile

PARAMETER	STROKE		P VALUE
	MEAN	STD DEVIATION	
TC	185.17	56.17	0.110
CHOL/HDL	5.98	2.49	0.680
TGL	169.85	194.82	0.340
HDL	41.52	64.11	0.420
LDL	125.23	49.31	0.460
VLDL	27.37	12.09	0.060

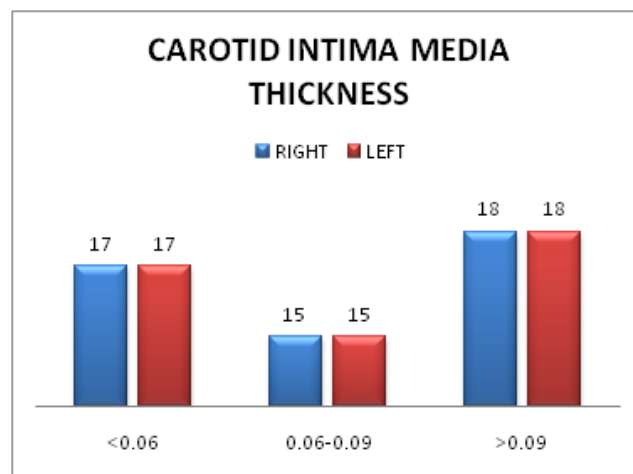


Artery Territory

Among 50 patients, 27 had infarct in MCA territories. 12 had in PCA territories. 1 had ACA territories. 4 had both in MCA and PCA territories. 1 had in both ACA and PCA territories.. 5 had in both ACA and MCA territories.

Carotid Intima Medial Thickness

Among 50 patients, 17 had carotid intima medial thickness less than 0.06, 15 had between 0.06 and 0.09. 18 had more than 0.09.



Correlation of the Parameters

	TC	CHOL/HDL	Right CAROTID DOPPLER	Left CAROTID DOPPLER
TC	1	.581**	.173	.083
CHOL/HDL		1	-.012	.027
Right CAROTID DOPPLER			1	.160
Left CAROTID DOPPLER				1

In the study group 13 out of 50 people died among those with stroke. The mortality was more for those having more carotid intima media thickness.

	<0.06	0.06-0.09	>0.09
ACA	1	4	3
MCA	14	7	8
PCA	5	4	9

In the study some patients had infarct involving multiple artery territory. Each infarct was given separate importance. Among ACA territory

infarcts 1 patient had CIMT <0.06. 4 had CIMT 0.06-.009. 3 had CIMT >0.09. Among MCA territory infarcts 14 patients had CIMT <0.06. 7 had CIMT 0.06-0.09. 8 patients had CIMT >0.09. Among PCA territory infarcts 5 had CIMT <0.06. 4 had CIMT 0.06-0.09. 9 had CIMT >0.09.

Mortality

Out of 50 cases, 13 cases had died. Among those who died, 6 had CIMT >0.09. 5 had CIMT 0.06 – 0.09. 2 had CIMT <0.06.

Conclusion

In the study it's found to have more CIMT thickness for those having ischemic stroke. Among the 50 patients, 18 people had CIMT >0.09. Also it's found to have, among strokes, posterior cerebral artery strokes had more CIMT (>0.09). Middle cerebral artery territory strokes had more patients with least CIMT (0.06). CIMT also can be used as a prognostic marker of ischemic stroke.

Bibliography

1. Lorenz WM et al. Carotid Intima-Media Thickening Indicates a Higher Vascular Risk Across a Wide Age Range. *Stroke*. 2006;37:87-92
2. Bots ML, Hoes AW, Koudstaal PJ, Hofman A, Grobbee DE. Common carotid intima-media thickness and risk of stroke and myocardial infarction: the Rotterdam Study. *Circulation*. 1997;96:1432–1437.
3. O'Leary D, Polak JF, Kronmal RA, Manolio TA, Burke GL, Wolfson SK Jr, for the Cardiovascular Health Study Collaborative Research Group. Carotid-artery intima and media thickness as a risk factor for myocardial infarction and stroke in older adults. *N Engl J Med*. 1999;340:14–22.
4. Nagao T, Sadoshima S, Ibayashi S, Takeya Y, Fujishima M. Increase in extracranial atherosclerotic carotid lesions in patients with brain ischemia in Japan: an angiographic study. *Stroke*. 1994;25:766-770.
5. Handa N, Matsumoto M, Maeda H, Hougaku H, Itoh T, Okazaki Y, Kimura K, Kamada T. An ultrasonic study of the relationship between extracranial carotid atherosclerosis and ischemic cerebrovascular disease in Japanese. *Jpn J Geriatr*. 1992;29:742-747.