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RESEARCH ARTICLE

ASYMPTOMATIC CAROTID ARTERY PREVALENCE IN CRITICAL LIMB ISCHEMIA IN SOUTH INDIAN POPULATION.

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Manuscript Info

Abstract

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Key words:

Asymptomatic carotid artery stenosis (ACAS), Carotid duplex ultrasonography (CDUS), Critical limb ischemia (CLI), Cerebrovascular disease (CVD), Atherosclerotic Occlusion (ASO).

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Aim: -To study the prevalence of ASYMPTOMATIC CAROTID ARTERY DISEASE and to identify predictive factors of carotid artery disease, in patients with critical limb ischemia in south Indian patients

Materials and methods: -Total of 250 patients with critical limb ischemia admitted in department of vascular surgery, madras medical college, Chennai, underwent carotid duplex scanning by department of radiology, madras medical college, Chennai and a questionnaire was used to collect data concerning known risk factors.

Results: - The mean age of the patients was 50±20 years; there were 242 (96.8%) men and 8 (3.2%) women; 72% of the patients had a history of smoking, 10.4% had coronary artery disease, 5.6% had hypertension, 5.6 % had dyslipidemia and 17.2% had diabetes mellitus. Eighteen (7%) patients had carotid artery disease detected by carotid artery duplex scanning of which insignificant Carotid artery disease found in 10 patients, significant carotid artery stenosis in 5 patients and complete occlusion of ICA in 3 patients.

Conclusion: -All patients with peripheral vascular disease with large vessel occlusion due to atherosclerosis have to be screened for carotid artery disease.

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Introduction:-

Carotid artery disease is associated with a risk of stroke. Approximately 88% of strokes are ischemic and about 20% of these originate from large artery stenosis. To prevent ischemic stroke, carotid endarterectomy has been recommended for asymptomatic patients with severe carotid stenosis based on evidence of multicentre prospective randomized trials. Carotid duplex ultrasonography (CDUS) is an accuracy-proven non-invasive diagnostic examination to detect asymptomatic carotid artery stenosis (ACAS). However, for the general population, CDUS has a limited role in screening of carotid disease because of a low overall prevalence of clinically relevant disease. Because coronary artery disease, cerebrovascular disease (CVD) and peripheral arterial disease (PAD) originate from atherosclerosis, these three diseases occasionally exist together. Therefore, screening CDUS may be useful for those populations. Several previous studies reported that the prevalence of ACAS was relatively high in patients with critical limb ischemia. In India, the prevalence of asymptomatic carotid artery disease in patients with critical limb ischemia has not yet.

Method and materials:-

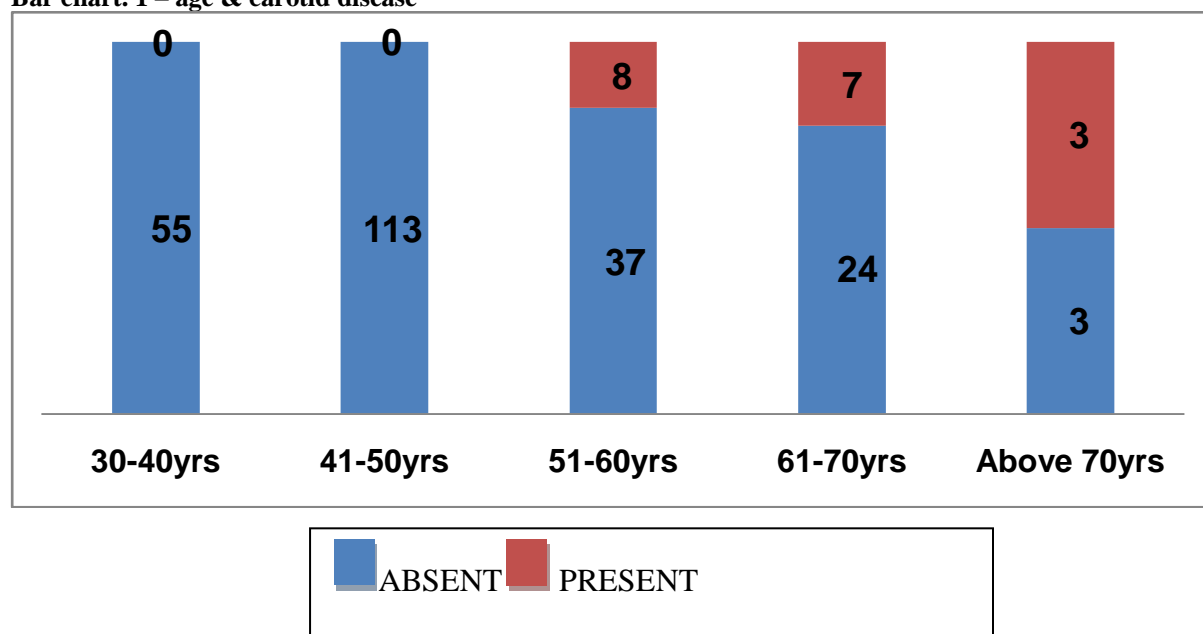
Carotid duplex scan was done for all 250 patients by the Radiology department and Carotid lesions were documented using Modified Washington duplex criteria.

Modified Washington duplex criteria

Stenosis	PSV	EDV	Spectrum
Normal	<125 cm/s		Normal with no plaque
1-15% (B)	<125 cm/s		Normal with plaque
16-49% (C)	<125 cm/s		Broadening
50-79% (D)	>125 cm/s	<140 cm/s	Broadening
80-99% (D+)	>125 cm/s	>140 cm/s	Broadening
Occluded (E)	No flow	No flow	No flow
PSV, peak systolic velocity; EDV, end diastolic velocity; cm/s, centimetres per second; CCA, common carotid artery; ICA, internal carotid artery; ECA, external carotid artery.			
EDV: 80cm/s ~ 60%; 100 cm/s ~ 70%			
ICA:CCA PSV ratio: 3.2 ~ 60%; 4.0 ~ 70%			

Observation and results:-

The carotid disease was present in 18 of 250 patients studied, which represents valid percentage of 7.2. The age pattern of carotid disease was shown in bar chart

Bar chart. 1 – age & carotid disease

The predictive factors of carotid disease and its statistical significance were shown in the following tables from Table 1 to 5.

Table 1:- diabetic mellitus & carotid disease.

			Carotid disease		Total
			Absent	Present	
DM	No	Count	200	7	207
		% within DM	96.6%	3.4%	100.0%
	Yes	Count	32	11	43
		% within DM	74.4%	25.6%	100.0%
	Total	Count	232	18	250
		% within DM	92.8%	7.2%	100.0%

Table 2:-hypertension & carotid disease.

			Carotid Disease		Total
			Absent	Present	
HT	No	Count	220	13	233
		% within HT	94.4%	5.6%	100.0%
	Yes	Count	12	5	17
		% within HT	70.6%	29.4%	100.0%
	Total	Count	232	18	250
		% within HT	92.8%	7.2%	100.0%

Table 3:-cad & carotid disease.

			Carotid Disease		Total
			Absent	Present	
CAD	No	Count	221	3	224
		% within CAD	98.7%	1.3%	100.0%
	Yes	Count	11	15	26
		% within CAD	42.3%	57.7%	100.0%
	Total	Count	232	18	250
		% within CAD	92.8%	7.2%	100.0%

Table 4:-dyslipidemia & carotid disease

			Carotid Disease		Total
			Absent	Present	
DYSLIPIDEMIA	No	Count	230	6	236
		% within DYSLIPIDEMIA	97.5%	2.5%	100.0%
	Yes	Count	2	12	14
		% within DYSLIPIDEMIA	14.3%	85.7%	100.0%
	Total	Count	232	18	250
		% within DYSLIPIDEMIA	92.8%	7.2%	100.0%

Table 5:-smoking & carotid disease

			Carotid Disease		Total
			Absent	Present	
SMOKER	No	Count	62	8	70
		% within SMOKER	80.0%	20.0%	100.0%
	Yes	Count	170	10	180
		% within SMOKER	95.2%	4.8%	100.0%
	Total	Count	232	18	250
		% within SMOKER	92.8%	7.2%	100.0%

The etiopathological pattern of carotid disease was shown with statistical data in pie chart and table 6.

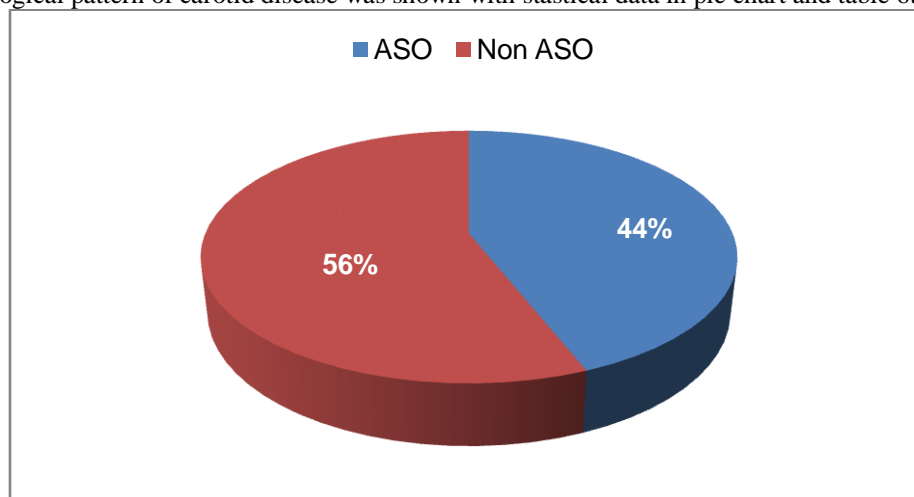


Table 6:-etiopathology & carotid disease.

			Carotid disease		Total
			Absent	Present	
ETIOLOGY	ASO	Count	92	18	110
		% within ETIOLOGY	83.6%	16.4%	100.0%
	NON ASO	Count	140	0	140
		% within ETIOLOGY	100.0%	.0%	100.0%
	Total	Count	232	18	250
		% within ETIOLOGY	92.8%	7.2%	100.0%

Discussion:-

Two hundred and fifty consecutive patients were studied over 1 year. The mean age of the patients was 50 ± 20 years; there were 242 (96.8%) men and 8 (3.2%) women; 72% of the patients had a history of smoking, 10.4% had coronary artery disease, 5.6% had hypertension, 5.6% had dyslipidemia and 17.2% had diabetes mellitus. Eighteen (7%) patients had carotid artery disease detected by carotid artery duplex scanning of which insignificant Carotid artery disease found in 10 patients, significant carotid artery stenosis in 5 patients and complete occlusion of ICA in 3 patients.

Risk Estimate

	Value	95% confidence interval	
		Lower	Upper
Odds Ratio for DM	9.821	3.547	27.195
Odds Ratio for HT	7.051	2.159	23.035
Odds Ratio for CAD	100.4	25.28	399.12
Odds Ratio for Dyslipidemia	230	41.92	1261.896
Odds Ratio for Smoker	0.200	0.073	0.545
Odds Ratio for Etiology	0.836	0.77	0.908

The P value was statistically significant (<0.05) for all parameters

In this study patients with critical limb ischemia due to non-atherosclerotic disease were 56% and due to atherosclerotic disease were 44%. In this study there is no prevalence of carotid disease in patients with critical limb ischemia due to non-atherosclerotic disease. The prevalence of asymptomatic carotid disease in critical limb ischemia patients is more common in elderly age group and in patients with DM, CAD and dyslipidemia ($p < 0.05$) which is statistically significant. The asymptomatic carotid disease is more prevalent in patients with large vessel

occlusion(Aorta,Iliac level occlusion) . The asymptomatic carotid disease is present only in patients with atherosclerotic occlusive disease (16.4%) similar to other studies reported. On multivariate analysis dyslipidemia, coronary artery disease and DM seemed to have independent influence ($p < 0.05$) which is statistically significant.

Conclusion:-

The prevalence of asymptomatic carotid artery disease in Indian subgroup patients with critical limb ischemia is 7%. However this study demonstrates a relatively high prevalence of carotid artery disease in patients with peripheral arterial disease due to atherosclerotic occlusion of 16.4% ($p < 0.05$) which is statistically significant. All patients with peripheral vascular disease with large vessel occlusion due atherosclerosis have to be screened for carotid artery disease.

Bibliography:-

1. Warlow C. Endarterectomy for asymptomatic carotid stenosis? Lancet 1995; 345(8960):1254-55.
2. Amarenco P, Cohen A, Tzourio C, Bertrand B, Hommel M, Besson G, et al. Atherosclerotic disease of the aortic arch and the risk of ischemic stroke. N Engl J Med 1994; 331(22):1474-9.
3. Blakeley DD, Oddone EZ, Hasselblad V, Simel DL, Matchar DB. Noninvasive carotid artery testing. A metaanalytic review. Ann Intern Med 1995; 122(5):360-7.
4. Ballotta E, Da Giau G, Abbruzzese E, Saladini M, Renon L, Scannapieco G et al. Carotid endarterectomy without angiography: can clinical evaluation
5. and duplex ultrasonographic scanning alone replace traditional arteriography for carotid surgery workup? A prospective study. Surgery 1999; 126(1):20-7.
6. Colgan MP, Strode GR, Sommer JD, Gibbs JL, Sumner DS. Prevalence of asymptomatic carotid disease: results of duplex scanning in 348 unselected volunteers. J Vasc Surg 1988; 8(6):674-8.
7. Chambers BR, You RX, Donnan GA. Carotid endarterectomy for asymptomatic carotid stenosis. Cochrane Database Syst Rev 2000;(2):CD001923.
8. Minar E. Peripheral arterial occlusive disease. Vasa 2007; 36(3):155-64.
9. Ballotta E, Da Giau G, Renon L, Abbruzzese E, Saladini M, Moscardi P et al. Symptomatic and asymptomatic carotid artery lesions in peripheral vascular disease: a prospective study. Int J Surg Investig 1999; 1(4):357-63.
10. House AK, Bell R, House J, Mastaglia F, Kumar A, D'Antuono M. Asymptomatic carotid artery stenosis associated with peripheral vascular disease: a prospective study. Cardiovasc Surg 1999; 7(1):44-9.
11. Klop RB, Eikelboom BC, Taks AC. Screening of the internal carotid arteries in patients with peripheral vascular disease by colour-flow duplex scanning. Eur J Vasc Surg 1991; 5(1):41-5.
12. Ahn SS, Baker JD, Walden K, Moore WS. Which asymptomatic patients should undergo routine screening carotid duplex scan? Am J Surg 1991; 162(2):180-3.
13. Ascher E, DePippo P, Salles-Cunha S, Marchese J, Yorkovich W. Carotid screening with duplex ultrasound in elderly asymptomatic patients referred to a vascular surgeon: is it worthwhile? Ann Vasc Surg 1999; 13(2):164-8.
14. Rancic Z, Radak D, Stojanovic D. Early detection of asymptomatic carotid disease in patients with obliterative arteriosclerosis of the lower extremities. Srp Arh Celok Lek 2002; 130(7-8):258-64.
15. Pilcher JM, Danaher J, Khaw KT. The prevalence of asymptomatic carotid artery disease in patients with peripheral vascular disease. Clin Radiol 2000; 55(1):56-61.