Intima-Media Thickness of Carotid Vessels and Carotid Artery Stenosis and their Relation with Coronary Artery Disease

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Abstract

Background- Atherosclerosis is a generalized process of vessels which involves coronary arteries and carotid vessels in a similar fashion. In this study we evaluate the relationship of coronary artery disease (CAD) with intima-media thickness (IMT) of carotid vessels and carotid artery stenosis.

Methods- 120 patients were subdivided into four groups: normal coronary; single vessel (SVD) and two-vessel (2VD); and three-vessel disease (3VD), established by means of coronary angiography. The groups were then prospectively evaluated with color duplex ultrasound (CDUS) examination during a 1-year period to assess the relationship of carotid artery stenosis and intima-media thickness (IMT) with CAD.

Results- From the 120 patients who underwent examination, two cases showed above 75% carotid stenosis, and 62.8% of the patients with three vessel disease exhibited more than 1.2 mm intima-media thickness with p value < 0.001.

Conclusions- We have not found a statistically significant relationship between significant coronary artery disease and carotid artery stenosis but a remarkable correlation with the degree of coronary artery disease and increased intima-media thickness. Auscultation of a bruit in the neck is not a reliable indicator of carotid artery Stenosis ***(Iranian Heart Journal 2003; 4 (4):60-62).***

Key words: coronary artery disease ■ intima-media thickness ■ carotid artery stenosis

Coronary artery disease (CAD) is the essential problem of human society in our world. Atherosclerosis is responsible for stenosis or total obstruction in coronary and carotid arteries, and carotid atherosclerotic disease is the major cause of stroke and cerebrovascular accidents and is important because of the potential problems that may occur during CABG surgery.

The aim of this study was to study the correlation between the intensity of coronary artery disease and the degree of carotid artery stenosis. In addition, we wanted to evaluate the correlation of the intima-media thickness (IMT) and the severity of coronary artery disease, as well as study the relation between the auscultation of the neck bruit and carotid stenosis.

Methods

This study was done on patients with coronary artery disease at our center during a one-year period from September 2002 to August 2003. These patients were referred to this center for angiography or CABG indications.

The patients were divided into four groups after angiography, namely normal coronary, single vessel disease (SVD),

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two-vessel disease (2VD) and three-vessel disease (3VD). They underwent CDUS and the intima-media thickness and the degree of carotid stenosis were estimated.

The patients were subdivided into three groups according to the degree of carotid stenosis:

1) >75%,
2) 50%-74%,
3) <49% stenosis.

The patients were also divided into three groups according to IMT:

1) < 0.9 mm,
2) 1 mm – 1.1 mm,
3) >1.2 mm.

The information was entered into a data base with the results of clinical examination, especially the auscultation of a bruit in the neck, risk factors and lipid profile of the patients.

Results

Of the 120 patients who underwent examination for carotid stenosis, 115 (95.8%) patients showed right internal carotid stenosis with less than 49%, 3 patients (2.5%) revealed 50-74% stenosis and 2 had > 75% stenosis.

In the left internal carotid artery, 118 (98.3%) patients showed stenosis less than 49% and 2 (1.7%) patients between 50-75% stenosis, and there was no stenosis more than 75%.

In right common carotid artery, 119 patients showed less than 49% stenosis; one patient had 50-74% stenosis, and there was no case with more than 75% stenosis.

Left common carotid artery findings were similar to those of the right common carotid artery.

Finally, of the 120 patients, 113 were not involved with carotid vessel stenosis of more than 50%.

In five patients, one of the carotid vessels was involved with a 50-74% stenosis, and in two patients one carotid vessel was involved with a more than 75% stenosis.

Table I: Coronary artery disease and carotid artery stenosis.

Coronary artery stenosis	carotid artery stenosis			
type	No.	≤ 49%	50% - 74%	≥ 75%
Normal coronary	30	29 (96.7%)	1 (3.3%)	–
SVD	30	29 (96.7%)	1 (3.3%)	–
MVD	60	55 (91.7%)	3 (5%)	2(3.3%)
Total	120	113	5	2

It means that there is significant carotid stenosis, only seen in the multi-vessels group. Furthermore, moderate stenosis (50-74%) had a higher incidence in the multi-vessel group rather than the normal coronary persons.

In the normal coronary group, 36.7% of the patients had IMT <0.9 mm, and 11.6% had IMT >1.2 mm.

In the SVD group, 13.3% of the patients had IMT <0.9 mm, and 36.7% of the patients had IMT >1.2 mm.

In the 2VD group, IMT less than 1mm was not reported, and 36.7% of the patients had IMT >1.2 mm.

In the MVD group, 6.7% of the patients had IMT <0.9 mm, and 53.3% of them had IMT >1.2 mm.

Finally, IMT was increased with the severity of the coronary artery involvement.

Table II: Intima-media thickness and coronary artery disease.

type	No.	≤ 0.9mm	1 – 1.1	≥ 1.2
Normal	30	11 (36.7 %)	14 (46.7 %)	5 (16.7%)
SVD	30	4 (13.3 %)	15 (50%)	11(36.7%)
MVD	60	2 (3.3 %)	31(51.7%)	27(45%)
Total	120			

We also examined the patients for the presence of bruit in the neck and detected the degree of carotid artery stenosis.

Conclusions

We found no relation between significant CAD and significant carotid artery stenosis. Significant carotid artery stenosis was only seen in multi-vessel coronary artery disease with *P*-value >0.05, which is not a statistically reliable finding. This finding is in contrast to that in other studies, which showed a significant relation. It is due to the fact that we did not evaluate patients with left main coronary lesion, and we considered only the stenosis which is truly flow limiting (above 75% stenosis), whereas other studies considered stenosis equal to or more than 50% as important stenosis.

We found a significant relation between the increased IMT and the degree of CAD with a statistically significant *p*-value <0.001. The relation between the auscultation of a bruit in the neck and the presence of stenosis showed a low sensitivity and high specificity with a moderate predictive value, and the auscultation of a bruit is not a reliable indicator of the presence of carotid artery stenosis.

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