Original article:
“Study of influence of age, sex, obesity, diabetic status on carotid artery intima media thickness”

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Abstract:

Introduction: The common carotid artery is a large bilateral vessel supplying head and neck. Carotid intima-media thickness is most commonly used as a noninvasive marker for atherosclerotic disease and is associated with increased risk of CVD. With this background the present study was planned to observe influence of age, sex, obesity, diabetic status on carotid artery intima media thickness in Indian population.

Materials and methods: 60 patient admitted in medicine wards are included in this study over a period from July 2012 to September 2014 are included in this study. All patients were examined in supine position with neck extended with a pillow under the shoulder. Ultrasonography of the common carotid artery, carotid bifurcation, and internal carotid artery of the left and right carotid arteries was performed with a 7.5-MHz linear-array transducer (Siemens Acuson x300). Detail history was recorded from patient. Age, sex, obesity, diabetic status was confirmed.

Observations and results: Among the 60 study subject 24 were female while remaining 36 were male. If we consider proportion of male and female in percentage, 40% were female and 60% were male patients. The same data wall also represented in below mentioned pie chart. Mean age of the patients were 52 years which range from 45 years to 7 years. Standard deviation of age was 7 years. Mean height of the patients were 160 cms which range from 147 cms to 177 cms. Standard deviation of height was 7.66 cms. Mean height of the patients were 61kgs which range from 48 kgs to 74 kgs. Standard deviation of weight was 5.61kgs. BMI was also calculated using weight (kg) divided by height (meter)2 in meter square. The study revealed that mean BMI was nearly 24kg with standard deviation of 2.12.

Conclusion: From this study we may conclude that age are one of important factor concern with CHD and more common in male. Diabetes is most commonly associated with it.

Keywords: Carotid intima-media thickness, diabetes

Introduction:
Carotid intima-media thickness (IMT) is widely used as a noninvasive marker for atherosclerotic disease and is associated with increased risk of CVD (1-3). Measurement of carotid IMT is being increasingly used as a non invasive marker of atherosclerosis. Alternatively a much more dramatic acute clinical event such as myocardial infarct, cerebrovascular accident may be the first manifestation of atherosclerosis. Carotid intima-media thickness (IMT) is a noninvasive predictor of atherosclerosis. IMT can also be extensively used to examine stage of atherosclerosis. With this background the present study was planned to see effects of hypertension on carotid artery IMT in type II diabetes subjects in western Maharashtra.

Materials and methods
Sixty patient admitted in medicine wards are included
in this study over a period from July 2012 to September 2014 are included in this study. “Institute Ethics Committee Clearance was obtained before start of Study”.

**Inclusion criteria**

Sixty patients who had normal liver function test (aspartate aminotransferase, alanineaminotransferase and alkaline phosphatase) were consecutively enrolled in this study. Patient between the age group of 45-70 years randomly selected irrespective of sex, duration, glycemic control with or without hypertension and with or without diabetic macrovascular complication with normal liver function tests.

**Exclusion criteria**

1. Age>70years.
2. Chronic alcoholic (>30g/day).
3. Pregnant women.
4. Active or chronic Renal/liver disease.
5. Patient on ocp and long term steroids or any hepatotoxic drug.

**Observations and results:**

Among the 60 study subject 24 were female while remaining 36 were male. If we consider proportion of male and female in percentage, 40% were female and 60% were male patients. The same data wall also represented in below mentioned pie chart. Mean age of the patients were 52 years which range from 45 years to 7 years. Standard deviation of age was 7 years. Mean height of the patients were 160 cms which range from 147 cms to17 7 cms. Standard deviation of height was 7.66 cms. Mean height of the patients were 61kgs which range from 48 kg to74 kgs. Standard deviation of weight was 5.61kgs. BMI was also calculated using weight (kg) divided by height (meter2) in meter square. The study revealed that mean BMI was nearly 24kg with standard deviationof

**Documented coronary or peripheral artery disease**

**Investigations:**

All patients who fulfilled inclusion criteria underwent carotid Doppler. Blood was withdrawn from all patients for creatinine, hemoglobin, mean corpuscular volume, fasting lipid profile, fasting blood sugar,serum GGT .All patients underwent ECG to look for evidence of ischemic heart disease.

**Evaluation of Intimal Media Thickness:**

All patients were examined in supine position with neck extended with a pillow under the shoulder. Ultrasononography of the common carotid artery, carotid bifurcation, and internal carotid artery of the left and right carotid arteries was performed with a 7.5-MHz linear-array transducer (Siemens Acuson x300).

**Statistical Analysis**

Statistical analyses were performed with SPSS software (Statistical Package for the Social Sciences, version 10.0, SSPS Inc., and Chicago, Illinois).

2.12. Mean pulse rate of the patients were 75 pulses per minute which range from 64 to 84 pulse per minute with a Standard deviation of 6.11. Mean respiratory rate of the patients were 15 years which range from 14 years to 17 per minute. Standard deviation of age was 1.06. At the time of study mean systolic blood pressure of the selected patients was 126mmHg with maximum of 150 and minimum of 116. Standard deviation was 9.42. Similarly mean diastolic blood pressure of the selected patients was 78mmHg with maximum of 88 and minimum of 70. Standard deviation was 4.89. Out of total 60 patients 27 (45%) had history of hypertension. This includes patients taking antihypertensive medications. Remaining 33 (5%) are not suffering from hypertension. Out of total 60 patients 10 (16.7%) had
history of diabetes. This includes patients taking anti-diabetic medications. Remaining 50 (83.3%) are non-diabetic.

In non-hyperplasia group diabetic were 12.72% while diabetic were 23.08% in hyperplasia group. These shows that diabetic were higher in hyperplasia group while non-diabetic were higher in non-hyperplasia group. However this difference was not statistically significant.

**Discussion**

The common carotid artery is a large bilateral vessel supplying head and neck. It ascends up to the level of the upper border of thyroid cartilage, where it divides into an external carotid, supplying the exterior of the head, face and most of the neck, and an internal carotid, supplying the cranial and orbital contents. The right and left carotid arteries differ in length and origin. The right carotid, originates from the brachiocephalic trunk behind the right sternoclavicular joint. The left carotid originates directly from the aortic arch immediately posterolateral to the brachiocephalic trunk. Following a similar course it ascends, diverging laterally from behind the sternoclavicular joint to the thyroid cartilage’s upper border, where it divides into external and internal carotid arteries. At its division the vessel has a dilatation, the carotid sinus, usually involving or restricted to the beginning of the internal carotid artery. The sinus is responsive to changes in arterial blood pressure, leading to reflex haemodynamic modification. Its position on the main artery of the brain accounts for its role as a baroreceptor in control of intracranial pressure. The carotid body, behind the common carotid bifurcation, a small, reddish-brown structure, is a ‘chemoreceptor’. Each carotid artery is contained in a carotid sheath, continuous with the deep cervical fascia. This sheath encloses also the internal jugular vein and vagus nerve; the vein lies laterally to the artery, the nerve between them and posterior to both. Out of total 60 patients 27 (45%) had history of hypertension while 10 (16.7%) had history of diabetes. In non-hyperplasia group hypertensive were 31.91% while hypertensive were 92.31% in hyperplasia group. These shows that hypertensive were higher in hyperplasia group while non-hypertensive were higher in non-hyperplasia group. This difference was statistically significant as the p value is less than 0.001.

The present study showed that hyperplasia was higher in elderly compare to lower aged patients and it was statistically significant. (p<0.001) The present study showed that height, weight and BMI was not associated with hyperplasia of Carotid artery and thus with the GGT level. P values for all these variable was more than 0.05. However, in a study by Nuti M et al (68) it was found that BMI was significantly associated with GGT level. Out of total 60 patients 27 (45%) had history of hypertension while 10 (16.7%) had history of diabetes. In non-hyperplasia group hypertensive were 31.91% while hypertensive were 92.31% in hyperplasia group. These shows that hypertensive were higher in hyperplasia group while non-hypertensive were higher in non-hyperplasia group. This difference was statistically significant as the p value is less than 0.001.

The strength of these findings is augmented when contrasted with the carotid thickening that
characterized patients with a history of CVD, a reassuring piece of evidence in agreement with the concept of carotid imaging as an indicator of the atherosclerotic burden across different vascular beds.

Conclusion
From this study we may conclude that age are one of important factor concern with CHD and more common in male. Diabetes is most commonly associated with it.

References: