ORIGINAL ARTICLE

Assessment of Common Carotid Artery Intima-Media Thickness in Hypertensive Individuals by B-Mode Ultrasonography

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ABSTRACT

Aim: To assess the frequency of increased common carotid intima-media thickness (IMT) in hypertensive individuals by B Mode carotid ultrasonography.
Study design: Cross Sectional study.
Setting: Department of Radiology, BVH, Bahawalpur. From 10-10-2012 to 10-04-2013**.**
Methodology: A total of 101 hypertensive patients with age ranges from 35-65 years of both gender with duration of HTN from 1-20 years were selected. Patients of IHD, diabetes mellitus, hyperlipidemias, H/o of smoking and pregnant females were excluded. Measurement of intima-media thickness of common carotid artery was done by B mode ultrasonography . Measurement of max. distance between the leading border of the luminal echo to the leading border of the media-adventitia echo was done. This measurement was taken as thickness of the intima and media i.e. IM complex. It was taken as increased when IMT is >0.8mm bilaterally
Results: Out of 101 patients, 68.3% were male and 31.7% were females with ratio of 2.2:1. Majority of patients 87(82.2%) were taking anti-hypertensive medication and out of these, 68 (81.9%) were on regular medication. Mean±SD value of hypertension duration was 13±4.7 years. IMT of common carotid artery in 94.1% in hypertensive subjects by ultrasonography and only 5.9% subjects had normal IMT.
Conclusion: In hypertensive subjects, IMT of common carotid artery is increased. It is concluded that B-mode ultrasonound of common carotid arteries might be used as a screening procedure in every hypertensive subjects.
Keywords: Intima-media thickness, hypertension, ultrasonography.

INTRODUCTION

For exact measurement of vessel wall thickness of the carotid arteries, high-resolution B-mode USG isuseful[1]. This USG shows the lumen diameter, the intima-media thickness, and extent of plaques in carotid artery[2]. B-mode USG with duplex can be used to see stenosis of the carotid artery, which showed advanced atherosclerotic vessel wall disease.[3]

METHODOLOGY

Sample size: 101 subjects were selected for the study.
Sample technique: Non-probability, purposive sampling.
Selection of subjects: Subjects having increased BP with duration 1-20 years, and ages 35-65 years with either sex were included. Subjects with IHD, diabetes mellitus, hyperlipidemias (serum cholesterol >200mg/dl), smokers and pregnant patients were not included in the study.
After approval of hospital ethical committee, 101 subjects were admitted in BVH, Bahawalpur fulfilling the inclusion/exclusion criteria. Proper history was taken and BP of each subject was measured. Then B-Mode USG of common carotid artery was done with 7.5MHZ linear array transducer with the subject in supine position and chest was elevation by pillow at the time of procedure. It was considered increased when IMT is >0.8mm bilaterally or on either side. **D**ata was analyzed statistically by SPSS version 16.0. Mean±SD was calculated for quantitative variables i.e. age, BP, hypertension duration and IMT of common carotid artery. Chi square test was applied to see the difference among them. P value <0.05 was considered as significant.

Received on 14-07-2019
Accepted on 27-10-2019

RESULTS

The detail of results is given in tables 1,2 and 3.

Table1: Age distribution

Age (in years)	n	%age
35-45	27	26.7
46-55	31	30.7
56-65	43	42.6

Fig 1: Gender distribution

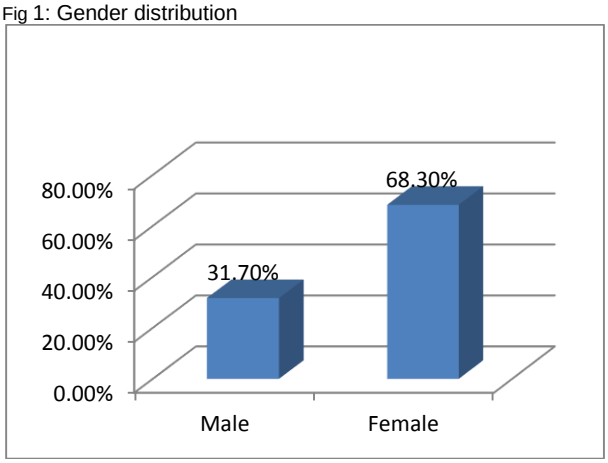


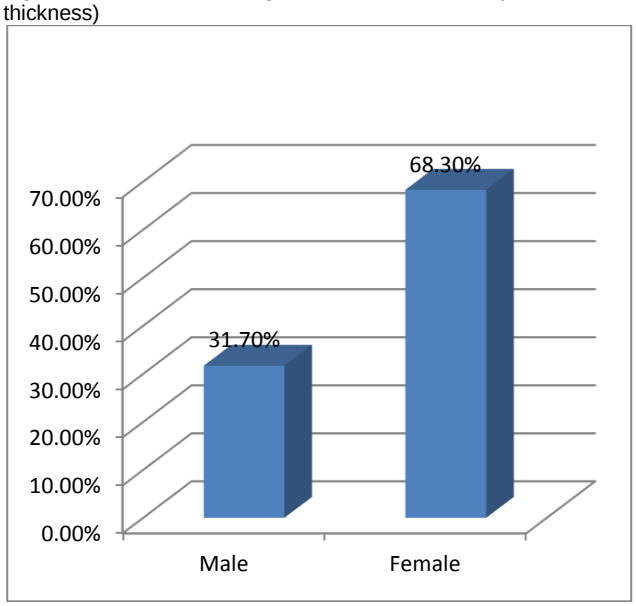
Table 2: Age distribution with gender

Age (in years)	Male (n=69)		Female (n=32)	
	n=	%age	n=	%age
35-45	18	17.82	09	8.91
46-55	20	19.80	11	10.89
56-65	31	30.69	12	11.88
Total	69	68.31	32	31.68

Table 3: Patients according to Increased IMT

Intima-Media Thickness (IMT) of Common Carotid Artery	Frequency	%age
Normal		
Right	00	00
Left	00	00
Bilateral	06	5.9
Total	06	5.9
Increased		
Right	24	23.8
Left	15	14.8
Bilateral	56	55.5
Total	95	94.1

Fig 2: Patients according to Increased IMT (intima media thickness)



DISCUSSION

The age of the patient plays an important role in IMT. The carotid wall thickness increases with age and is augmented in hypertensive subjects. This process is associated with a decrease of baroreflex sensitivity.[4] Labrova R et al[5] have shown a positive correlation between age and carotid artery IMT in hypertensive subjects. In another study by Adaikkappan et al[6,,] it is found that there is significant association between the IMT and age. Plavnik et al[7] have also shown the similar result.

In our study, it is also observed that IMT have positive association with age and 100% subjects >56 years of age have increased IMT. In this study, age was from 35 to 65 years with mean±SD 57±4.7 years and this study is consistent with the study of Korcarz CE et al[8] who also observed same age ranges. On the other hand, Labrova R et al[5] had observed much lower mean age i.e. 47 years, while Amato M et al[9] much higher i.e., 61 years of age as compared to this study.

This study showed a significant increase in common carotid artery IMT IMT in hypertensive subjects. Many researchers have shown association between IMT and Hypertension. Adaikkappan M et al[6] compared the carotid artery IMT of hypertensive subjects with normal subjects and found that there is significant increase in carotid IMT in hypertensive subjects when comparing with normal. In another study conducted by Plavnik FL et al[7] also showed IMT of common carotid artery to be significantly increased in hypertensive subjects as compared with that of normal subjects.

CONCLUSION

B mode ultrasound is a safe, non invasive method in the evaluation of common carotid artery intima media thickness in hypertensive subjects. In addition, assessment of Intima media thickness could be helpful in the prediction of cardiovascular disease (CVD) risk. So it is used as an early marker of atherosclerosis.

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