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Carotid Intima Media Thickness Percentiles for Pakistani Population

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Carotid artery intima media thickness (CIMT) measurement is one of the best non-invasive parameters for evaluating the previous vascular damage. It is a surrogate measure of vascular atherosclerosis and represents vessel wall alterations over time, caused by different risk factors.¹ CIMT is highly associated with cardiovascular risk factors,² and robust predictor of cardiovascular outcomes and cerebrovascular complications.³⁻⁶ The measurement of CIMT has also been advocated and proposed as a non-invasive tool for cardiovascular risk assessment in primary prevention.⁵

B-mode ultrasound is the modality of choice for CIMT evaluation as it is accurate, safe, cost-effective and easily available. Various investigators have derived CIMT centiles for correct interpretation of normal reference values, but there is a paucity of literature for the South Asian population. Normal values of CIMT for Pakistani population have not been established. This study was reviewed and approved by the Hospital Ethics Committee. Ultrasound measurements were done in a standardized way by using electronic caliper installed in the ultrasound machine. CIMT was defined as a distance between the leading edge of luminal echo to the leading edge of the adventitia of the media. During periods of diastole, the image was frozen, and the measurements were assessed 1cm proximal and distal to the carotid bulb on both sides.

Data was entered and analyzed by SPSS version 21. Mean ±SD was calculated for continuous variables and frequencies and percentages were computed for categorical variables. Moreover, 10th, 25th, 50th, 75th and 90th centiles were computed for each common carotid and internal carotid artery measurement and displayed in graph form. The mean difference was found in left common carotid artery (0.55 ±0.13) and left internal carotid artery thickness (0.50 ±0.10) significant at p=0.031 and p=0.014, respectively. The IMT percentile graphs developed in this study for internal and common carotid arteries are exclusive for this population and can be used to assess vascular health from ultrasound measurements.

Key Words: Carotid intima media thickness. Ultrasound. Hypertension.
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Figure 1: IMT changes in (A) right common carotid artery related to age, (B) right internal carotid artery related to age, (C) left common carotid artery related to age, (D) left internal carotid artery related to age (men percentiles according to established age-range).

Figure 2: IMT changes in (A) right common carotid artery related to age, (B) right internal carotid artery related to age, (C) left common carotid artery related to age, (D) left internal carotid artery related to age (female percentiles according to established age-range).
the use of ultrasound as an excellent tool for detecting asymptomatic carotid alterations and patients at high risk for the cerebral and cardiovascular disease.

There were two important limitations to this study, firstly it is a small single-hospital-based study; and secondly some baseline characteristics of the patients like height and systolic blood pressure were not adjusted. The authors recommend future studies to look into the variations of the IMT ranges within different ethnic groups in Pakistan using a large population-based sample.

Disclosure: This study is a part of larger project named Carotid Artery Ultrasound and Vascular Atherosclerosis supported by seed money grant # PF12/1011 of Aga Khan University and published in Journal of Pakistan Medical Association.2

REFERENCES


