

Relations of intimal-medial thickness among sites within the carotid artery as evaluated by B-mode ultrasound

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Background and Purpose: B-mode ultrasound is a widely used technique for the clinical and epidemiological assessment of carotid atherosclerosis. This article describes the relation between arterial intimal-medial thickness (IMT) at different sites within the extracranial carotid artery.

Methods: IMT was measured by B-mode real-time ultrasound as an index of atherosclerotic involvement in the extracranial carotid arteries as part of the population-based Atherosclerosis Risk in Communities (ARIC) study. The relation between IMT at different sites was described by correlation coefficients and percentile regression techniques based on between 4034 and 9386 pairs of measurements (variation in sample size depending on the paired sites).

Results: Increased IMT at one site was associated with increased IMT at other sites. The correlation between right and left IMT at the same anatomic location in the carotid artery ranged from .34 to .49; the correlation at different anatomic locations in the carotid artery on the same side ranged from .25 to .43. The distribution of IMT, described by the percentiles of IMT at the inference site as a function of IMT at the index site, showed constricted percentiles of IMT at the inference site for small IMT at the index site and an increase in the spread of percentiles with increasing IMT.

Conclusions: Although increased carotid IMT at one site is positively associated with thickened walls at other carotid sites, the ability to accurately predict wall thickness at a site given the wall thickness at other sites is modest. The general association between sites supports the systemic nature of Atherosclerosis, while the lack of tight agreement between sites supports the focal nature of the atherosclerotic process.

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