Comparison of Brachial Artery Resistive Index with Intima-Media Thickness of Carotid Artery as Sonographic Markers of Atherosclerosis

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Abstract:

Background and objective: Intima-media thickness (IMT) in common carotid artery (CCA) can be assessed during carotid arterial ultrasonography. However, it's association with resistive index (RI) in brachial artery (BA), as a useful tool to evaluate atherosclerosis progression has not been clarified well. The aim of this study was to examine the relationship between IMT in CCA and RI in BA. Material and methods: IMT and RI of CCA and BA were evaluated in 90 men with 30 control carotids, 30 mild carotid stenosis, and 30 severe stenosis using B-mode and Doppler ultrasonography. RI was measured based on the peak-systolic and different parts of diastolic velocities in Doppler spectrum in BA. Results: The intima-media thickness of the left common carotid Artery (LCCA) increased from 0.57 ± 0.14 in the control group to 0.73 ± 0.15 in the mild stenosis group and 0.90 ± 0.11 in the severe stenosis group. RI d-end and RI d-mean of the left brachial artery (LBA) increased from 0.85 ± 0.09 and 0.82 ± 0.05 in the control groups to 0.89 ± 0.08 and 0.85 ± 0.04 in the mild stenosis groups and 0.94 ± 0.06 and 0.89 ± 0.04 among sever groups, respectively. Conclusion: Between experimental groups, there was a significant difference in IMT of LCCA and RI of LBA, separately (p-value < 0.05). The Pearson correlation analysis showed a significant correlation between IMT of LCCA and RI of LBA. The brachial artery resistive index is associated with intima-media thickness of common carotid artery. This study showed that atherosclerosis was a generalized process that might involve the entire vasculature. Besides, we propose that RI measurements from each of the Doppler velocity
spectrums of brachial artery and their averaging ($RI_{\text{mean}}$) may be a better index for explaining progression of atherosclerosis in brachial artery rather than $RI_{d\text{-end}}$ alone. Due to the above-mentioned matters, it seems that $RI$ in BA with accompaniment of $IMT$ in CCA could be a useful tool to evaluate atherosclerosis progression.

**Keywords:** BRACHIAL ARTERY; CAROTID ARTERY; IMT; RI; ULTRASONOGRAPHY

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