

Screening for High-grade Carotid Stenosis Using a Portable Ultrasonography Instrument

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摘要

Abstract

Background and Purpose. We investigated the diagnostic performance of a brief Power Doppler Imaging (PDI) screening examination for carotid artery stenoses using a newly developed portable instrument. **Methods.** A highly experienced sonographer screened in total 152 carotid arteries by either continuous wave (cw) Doppler (n= 50) or a lightweight (2.4 kg) portable duplex device (n= 102) in a prospective study of 76 high-risk patients. The screening protocols included either spectrum analysis and frequency shift measurement in both internal carotid arteries with cw-Doppler or determination of area and diameter ratios in transverse and longitudinal views of both carotid arteries in B-mode and with PDI, but without velocity measurement. Both protocols were evaluated against a complete routine duplex ultrasonography examination.

Results. According to the complete examination, stenoses were <50% in 73 of 102 (71.6%), 50–75% in 19 of 102 (18.6%), 75–95% in 7 of 102 (6.9%), and occluded in 3 of 102 (2.9%) arteries (PDI cohort), and <50% in 39 of 50 (78%), 50–75% in 8 of 50 (16%), 75–95% in 2 of 50 (4%), and occluded in 1 of 50 (2%) artery (cw-Doppler cohort). Mean screening time was 8.8 ± 2.5 minute (PDI) and 9.4 ± 2.6 minute (cw-Doppler). For stenoses >75%, Az values (area under the receiver operating characteristics curve) were 0.897 for area ratios, 0.843 for diameter ratios (PDI protocol) and 1.0 for the cw-Doppler protocol.

Conclusions. The diagnostic performance of the cw-Doppler protocol was superior to the PDI protocol. Nevertheless, both protocols appear suitable as inexpensive screening strategies to identify subjects with >75% stenosis measured by carotid Doppler ultrasound.

However, these preliminary data need further verification.