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Reliability of Hand-Held Transcranial Doppler with M-mode Ultrasound in Middle Cerebral Artery Measurement.

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Abstract

Purpose: To determine the intra- and interrater agreement of mean flow velocity (MFV) and pulsatility index (PI) measurement in middle cerebral arteries, assessed by transcranial Doppler (TCD) with M-mode.

Methods: Masked experienced neurosonologists performed TCD with M-mode using handheld probe in healthy adult volunteers. The Bland–Altman method for concordance and intraclass correlation coefficient were used.

Results: Seventy-seven healthy volunteers and seven raters participated (3 on regular TCD shift and 4 off-shift). The intrarater absolute mean difference between measurements was 5.5 cm/s [95% confidence interval (CI), 4.7–6.3] for MVF and 0.073 (95% CI, 0.063–0.083) for PI. The difference between MFV measurements was significantly higher in off-shift raters (p = 0.015). The interrater absolute mean difference between measurements was 6.5 cm/s (95% CI, 5.5–7.5) for MVF and 0.065 (95% CI, 0.059–0.071) for PI. No influence was found for the middle cerebral artery side, volunteer's sex, or age, and there was no significant difference between raters. The intraclass correlation coefficient was 82.2% (95% CI 77.8–85.6) and 72.9% (95% CI 67.4–77.6) for MFV and PI, respectively.

Conclusions: There exists good intra- and interrater agreement in MFV and PI measurements using M-mode TCD. These results support the use of this noninvasive tool and are important for clinical and investigational purposes.