

**ASSOCIATION BETWEEN SEVERITY OF CEREBRAL SMALL VESSEL DISEASE,
PULSATILITY OF CEREBRAL ARTERIES AND BRACHIAL ANKLE PULSE WAVE
VELOCITY IN PATIENTS WITH LACUNAR INFARCTION**

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Background & Objectives: Stiff arteries cause high pulse pressure and flow to be transmitted to distal organs during systole, leading to the damage of cerebral microvasculatures. Elevation in pulsatility index (PI) measured by transcranial Doppler (TCD) has been postulated to reflect increased resistance of distal vasculature. The aim of this study was to investigate the association between severity of cerebral small vessel disease (CSVD), pulsatility of cerebral arteries, and stiffness of large arteries in lacunar infarction (LI).

Method: Subjects included 120 patients with LIs, who underwent MRI, TCD, and brachial ankle pulse wave velocity (BaPWV). We reviewed brain MRI to assess the number of previous LIs and severity of white matter lesions (WMLs). We compared severity of CSVD, pulsatility index (PI) of both MCAs, and baPWV.

Results: Patients with higher baPWV were more likely to have multiple LIs and more severe WML, and tended to have higher age, systolic blood pressure, pulse pressure, heart rate, and the PI of MCA. The PI of MCA was significantly correlated with baPWV (with PI: $r=0.427$, $p<0.001$) and age (with PI: $r=0.556$, $p<0.001$). Multiple linear regression analysis indicated that aging and baPWV were independent determinants of PI of MCA after adjustment for sex, pulse pressure, hypertension, and diabetes.

Conclusion: These findings suggest that arterial stiffness may be pathophysiologically associated with CSVD and pulsatility of cerebral arteries. Thus, our findings support that measurement of arterial stiffness could be useful for quantitatively assessing CSVD.