



Conference Abstract

P.18 Carotid Stiffness Parameters and Cerebral Blood Flow Pulsatility in Young Healthy Individuals across Races

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ABSTRACT

Background: Higher cerebral blood flow (CBF) pulsatility was found to be associated with severer brain white matter lesions in the elderly [1]. It was hypothesized that the central/elastic arterial stiffness/compliance may directly affect CBF pulsatility. However, it is still unclear which carotid stiffness parameters may better reflect this impact, and whether race and sex differences are present.

Methods: To study the correlations among those parameters with comparisons between different races and sexes, we enrolled 35 young healthy subjects (19 females), aged 29 ± 5 (18~40) years, with three races of comparable age and sex ratio, i.e. White ($n = 16$), Black ($n = 7$), and Asian ($n = 12$). All subjects were in resting seated position, with continuous transcranial Doppler recording of CBF velocity at middle cerebral artery (MCA), simultaneous 1-min ultrasound echo-tracking on bilateral common carotid arteries, and multiple measurements of brachial blood pressure (BP).

Results: All derived parameters [2], including MCA pulsatility index (PI), showed no significant racial differences but with significantly ($p < 0.05$) higher carotid stiffness index (β), Peterson's pressure modulus (Ep), BP pulsatility index (mostly driven by higher systolic BP but similar diastolic BP), and lower arterial compliance (AC, $p = 0.07$) in males than in females. Only AC (but not β and Ep) showed a significant correlation with PI ($r = 0.49$, $p = 0.004$) even after controlling for BP pulsatility index, which negatively correlated with AC ($\rho = -0.35$, $p = 0.038$).

Conclusions: Higher carotid AC (i.e. decreased stiffness) seems to enhance CBF pulsatility in young healthy populations, which might differ from the elderly.

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