Arterial stiffness is Associated with Enlarged Perivascular Space in Basal Ganglia

Kwang-Yeol Park, MD; Jae-Han Bae, MD; Moo-Seok Park, MD; Jeong-Min Kim, MD

Department of Neurology, Chung-Ang University Hospital, Chung-Ang University College of Medicine, Seoul, Korea

**Abstract**

**Objective**: Enlarged perivascular space (EPVS) is one of the neuroimaging biomarkers of cerebral small vessel disease. The aim of this study was to investigate the association of arterial stiffness and the topography of EPVS.

**Methods**: We identified 411 consecutive patients with acute ischemic stroke or transient ischemic attack who underwent MR imaging and brachial-ankle pulse wave velocity (baPWV) measurement. EPVS was assessed in basal ganglia and centrum semiovale. The severe EPVS was defined as >21 EPVS and baPWV was dichotomized at median value. The association between severe EPVS and higher baPWV was tested by multiple logistic regression analysis. This study was approved by the local institutional review boards.

**Results**: Mean age of 411 patients was 68 (±12) years. When baPWV were divided into quartile, the proportions of severe EPVS in each quartile were 9%, 19%, 41%, and 39% in basal ganglia and 19%, 42%, 39%, and 44% in centrum semiovale, respectively. On bivariate analysis, severe EPVS was significantly associated with higher baPWV in both basal ganglia and centrum semiovale. However, on multivariable analysis, severe EPVS was significantly associated with higher baPWV in basal ganglia (odds ratio 1.7; confidence interval 1.0 – 2.7; p = 0.048), but not in centrum semiovale (1.4; 0.9 – 2.3; p = 0.14).

**Conclusion**: This study showed that severe EPVS was associated with higher baPWV in basal ganglia, but not in centrum semiovale. We presumed that arterial stiffness measured by baPWV might be more closely related with small vessel disease in deep brain structure.