Introduction: Latest evidence indicates the association of atrial diseases with embolic strokes of undetermined source. This study aimed to investigate the relationship between advanced interatrial block (aIAB, an electrophysiological mark of atrial abnormality) and silent cerebral small vessel diseases (SVD) in the absence of atrial fibrillation (AF) and atrial flutter.

Methods: This study included 499 patients with normal left ventricular ejection fraction (LVEF), who were free of AF, atrial flutter, stroke and acute coronary syndrome. aIAB was detected from digital electrocardiograms. Left atrial diameter, left ventricular ejection fraction (EF) and left ventricular posterior wall thickness (LVPWT) were measured on echocardiograms. Four manifestations of SVD, including white matter hyperintensity (WMH), lacunes, microbleeds and enlarged perivascular spaces (EPVS), were rated on magnetic resonance imaging. Regression models were used to explore the association of aIAB with these 4 manifestations after adjusting for confounding factors, respectively.

Result: A total of 23 (4.6%) patients had aIAB and 67 (13.4%), 21(4.2%) had lacunes and CMBs, respectively. The mean score/number of WMH and EPVS were 6.2 and 66.2, respectively. After adjusting for age, sex, hypertension, diabetes, hyperlipidemia, left atrial diameter, LVEF and LVPWT, regression models showed a significant association of aIAB with WMH (β=1.463, 95% CI 0.310-2.616), and with lacunes (OR=3.647, 95% CI 1.174 -11.332), respectively. No association of aIAB with EPVS or CMBs was found.

Conclusion: aIAB was independently associated with a high burden of WMH and lacunes in the brain.