Increased P-Wave Terminal Force in Lead V1 Predicts Cryptogenic and Cardioembolic Strokes: The Northern Manhattan Study


Background

P-wave terminal force in EKG lead V1 (PTFV1), a measure of left atrial conduction, is a marker of left atrial dysfunction and has been associated with stroke risk. We hypothesized that PTFV1 would be associated with risk of cardioembolic and cryptogenic strokes in the absence of history of atrial fibrillation (AF).

Methods

A case-cohort study was conducted in the Northern Manhattan Study, a prospective cohort study of stroke risk factors. PTFV1 was manually measured from baseline EKGs of participants in sinus rhythm who subsequently had ischemic strokes (cases, n=241) and a randomly selected subcohort (n=798). Hazard ratios and 95% confidence intervals (adj HR, 95%CI) for the association of PTFV1 with ischemic stroke and TOAST stroke subtypes were calculated using weighted Cox proportional hazards models after adjusting for demographics, history of AF, heart failure, diabetes, hypertension, smoking, and lipids.

Results

PTFV1 was available for 975 participants: mean PTFV1 was 3933.6 (±2540.7) µV-ms in the subcohort and 4451.6 (±3368.2) µV-ms among stroke cases. The intra-rater (0.87, 95%CI 0.79-0.92) and inter-rater (0.69, 95%CI 0.45-0.80) reliabilities were good to excellent for measurement of PTFV1. After adjusting for traditional risk factors, PTFV1 was associated with increased risk of all ischemic strokes (adj HR 1.20 per standard deviation (SD) of PTFV1, 95% CI 1.03-1.39), and cryptogenic and cardioembolic strokes combined (adj HR 1.31 per SD of PTFV1, 95% CI 1.08-1.58). Results for cryptogenic and cardioembolic stroke subtypes considered individually were similar. There was no association with non-cardioembolic stroke subtypes. After excluding those with history of AF, results were similar (for all ischemic stroke, adjusted HR 1.24 per SD PTFV1, 95% CI 1.06-1.45; for combined cryptogenic/cardioembolic, adjusted HR 1.34 per SD PTFV1, 95% CI 1.11-1.63). Conclusion: Increased PTFV1, a marker of left atrial dysfunction, is associated with cryptogenic and cardioembolic stroke independent of history of AF and heart failure. Further studies are warranted to determine whether preventive strategies, like those used for patients with AF, may prevent ischemic stroke in those with increased PTFV1.

Disclosure