Stroke: Highlights of Selected Articles

Section Editor: Erica C. Camargo, MD, PhD

Volume 46 ■ Number 11 ■ November 2015

**Electrocardiographic Left Atrial Abnormality and Risk of Stroke: Northern Manhattan Study**

Embolic strokes of undetermined source comprise a subset of cryptogenic ischemic strokes. It is thought that some embolic strokes of undetermined source could be due to left atrial thromboembolism without atrial fibrillation. The authors sought to determine whether a marker of left atrial pathological changes could pose as a surrogate marker of nonarrhythmogenic atrial thromboembolism in embolic strokes of undetermined source. To this end, Kamel et al studied the association between electrocardiographic P-wave terminal force in V1 (PTFV1), which has been associated with ischemic stroke in the absence of atrial fibrillation, and cryptogenic ischemic strokes in the Northern Manhattan Study population. The authors designed a case–cohort study, randomly choosing a subcohort of participants who had electrocardiography (n=798), and all subjects who developed ischemic strokes in follow-up (n=241). Participants with atrial fibrillation at baseline or during follow-up were excluded. The study showed that in adjusted models, there was an association between PTFV1 and a composite of cryptogenic or cardioembolic stroke (adjusted hazard ratio per SD, 1.31; 95% confidence interval, 1.08–1.58). For cardioembolic or cryptogenic stroke, PTFV1 was associated with a 50% increase in risk (hazard ratio 1.56; 95% confidence interval, 1.25–1.96). Interestingly, the associations between electrocardiographic left atrial abnormality and most stroke subtypes were attenuated after adjustment for left atrial size on echocardiogram, suggesting that PTFV1 may, in part, reflect left atrial dilatation. This interesting study, therefore, indicates that the strong association of PTFV1 with cardioembolic and cryptogenic strokes supports a specific link with left atrial thromboembolism, in the absence of atrial fibrillation. PTFV1 had good inter- and intrarater reliability in this study. Therefore, PTFV1 may be considered as a potential surrogate marker for atrial thromboembolism and, therefore possibly modifying therapeutic strategies in patients with embolic strokes of undetermined source at high risk for recurrent thromboembolism. See p 3208.

**Effect of Hyperacute Administration (Within 6 Hours) of Transdermal Glyceril Trinitrate, a Nitric Oxide Donor, on Outcome After Stroke: Subgroup Analysis of the Efficacy of Nitric Oxide in Stroke (ENOS) Trial**

Neuroprotection continues to be an area of active research in acute stroke management. One such study was the Efficacy of Nitric Oxide in Stroke (ENOS) trial. This was a single-blind, multinational study that examined the safety and efficacy of transdermal glyceryl trinitrate (GTN) versus no GTN within 48 hours, and for a total of 7 days, in 4011 patients with acute ischemic or hemorrhagic stroke. GTN was hoped to have neuroprotective properties because nitric oxide donors have been shown to reduce stroke lesion size, increase and maintain cerebral blood flow, and improve arterial compliance, both in animal and in human studies. In ENOS, GTN was safe to administer but did not alter the modified Rankin Scale score at 90 days. Woodhouse et al studied a subset of 273 patients from ENOS who were enrolled in the study within 6 hours, 144 of which were randomized to GTN. Patients receiving early GTN had a significant shift to a lower modified Rankin Scale score at 90 days than no GTN (adjusted odds ratio, 0.51; 95% confidence interval, 0.32–0.80; mean modified Rankin Scale score 2.6 versus 3.2, respectively). Early treatment with GTN was also associated with improvements in activities of daily living, quality of life, cognition and mood at 90 days. Furthermore, early GTN was safe and reduced the rates of death and serious adverse events. Given that these exciting results are from a subgroup analysis of a clinical trial, they need to be replicated. Hence, this finding will be explored in the Rapid Intervention With Glyceryl Trinitrate in Hypertensive Stroke Trial 2 (RIGHT-2) trial, which will prospectively assess the safety and efficacy of GTN in patients with ultra-acute stroke in the prehospital phase. See p 3194.

**Outcomes of Spoke-Retained Telestroke Patients Versus Hub-Treated Patients After Intravenous Thrombolysis: Telestroke Patient Outcomes After Thrombolysis**

Telemedicine has promoted equalization in medical care. Specific to stroke, telemedicine has led to an increase in the rates of tissue-type plasminogen activator administration in community hospitals affiliated with a telestroke network. However, it is unclear whether tele-neurology’s benefits are sustained over a longer period of time. To better explore this, Helfner et al performed a retrospective analysis of 137 consecutive patients with acute ischemic stroke treated with intra-venous tissue-type plasminogen activator after telemedicine consultation at 5 University of Pittsburgh Medical Center spoke hospitals who remained there for treatment (drip-and-stay); 274 consecutive patients treated at University of Pittsburgh Medical Center Presbyterian Hospital (hub); and 73 patients who received tissue-type plasminogen activator at the spoke hospitals and later transferred to University of Pittsburgh Medical Center Presbyterian Hospital (drip-and-ship). Drip-and-stay patients were older (76.19±14.85 versus 72.07±14.5; P=0.008), had significantly lower National Institutes of Health Stroke Scale (9.5±5.9 versus 12.7±7.1 H; P<0.001), and had fewer large vessel occlusions (11.9% versus 36%; P=0.001) than hub patients. Despite the less severe strokes, drip-and-stay patients had a significantly longer hospital length of stay and a significantly higher risk of in-hospital mortality. These results bring into question the underlying reasons for such disparities in outcomes. The most obvious is that treatment in stroke units leads to improved clinical outcomes, as has been well established in the literature, despite the higher acuity level of the patients treated at the hub than at the spokes. However, as the authors point out, it suggests that the impact of a telestroke network should be judged not only by the acute stroke management but also extend to the entire episode of stroke care to assure optimal stroke outcomes. See p 3161.
The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://stroke.ahajournals.org/content/46/11/3041