

EDITORIAL COMMENT

Acute Stroke Treatment

Carotid “Stenters” to the Rescue*

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Acute ischemic stroke is a devastating illness that will affect three-quarters of a million Americans this year (1). Not only is stroke one of the leading causes of death, it is our leading cause of adult disability (2). Similar to acute myocardial infarction, the primary treatment goal for stroke is early reperfusion to prevent or minimize injury. Unfortunately, American medicine has failed to make “on-demand” (24 h/day, 7 days a week, 365 days a year) reperfusion therapy as accessible for stroke as it has for heart attacks. Without a national mandate for “90-min door-to-balloon time,” stroke has been left behind. Our failure to offer timely on-demand access to stroke reperfusion therapy is a national healthcare embarrassment—an “elephant in the room” that no one is talking about. The only way to let this elephant out of the room is to remove the barriers to on-demand stroke reperfusion therapy.

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In 1996, the U.S. Food and Drug Agency (FDA) approved intravenous (IV) tissue plasminogen activator (t-PA) for acute stroke, but *only* if administered within 3 h after onset to patients without contraindications (3,4). Today, 15 years later, IV t-PA remains the only approved therapy for acute stroke, with a recent guideline update extending the treatment time from 3 h to 4.5 h for a selected group of low-risk patients (5). Amazingly, despite FDA approval, IV thrombolysis is infrequently used for ischemic stroke patients with <2% of patients (1 in 50) so treated (6). Although rapid initiation of IV t-PA with a “door-to-needle time” of <60 min is important for a good outcome, the American Heart Association Get With The Guidelines—Stroke national registry recently reported that less than one-third of stroke patients treated with IV t-PA are treated in <60 min of arrival at the hospital (7).

The major reasons why stroke patients are not treated with IV t-PA are because: 1) they present too late (>3 to 4.5 h) after the onset of symptoms for IV t-PA; or 2) they are poor candidates for IV t-PA. The good news is that many of these patients can still receive catheter-based reperfusion therapy *if* an interventional stroke team is available (8–10). The bad news is that, due to manpower shortages of specialized stroke physicians, there are few hospitals that offer on-demand, catheter-based stroke therapy.

Barriers to providing on-demand stroke reperfusion therapy are largely related to shortages of stroke specialty physicians. In contrast, manpower has not been a barrier to providing timely reperfusion therapy for ST-segment elevation myocardial infarction (STEMI) patients. The national standard for STEMI care is a 90-min door-to-balloon time, with cardiologists and cardiac catheterization laboratories available 24 h/day, 7 days a week, 365 days a year to provide emergency on-demand reperfusion therapy. This quality mandate is reinforced by Medicare’s publicly reported Core Measures that specifically report individual hospital’s door-to-balloon times.

A shortfall of stroke specialty physicians may explain the discrepancy between on-demand reperfusion therapy for STEMI patients compared with ischemic stroke patients. There are not enough stroke neurologists—physicians who are skilled in diagnosing and prescribing treatment for stroke patients for every hospital emergency department to have one on call at every hospital that treats stroke patients. One way to lessen the impact of the limited number of stroke neurologists is to use telemedicine. With an effective telemedicine program, a single stroke neurologist can support acute stroke care in multiple remote hospitals (11).

There is also a shortage of interventional neuroradiologists (i.e., physicians skilled in intracranial catheter-based therapies). Traditionally, these physicians have been expected to provide on-demand catheter-based stroke reperfusion therapy. However, according to 1 report, there are 5 U.S. states without a neuroradiologist (12). There are not enough neuroradiologists for every hospital treating strokes to have sufficient manpower available for on-demand catheter-based reperfusion therapy. Because of the need for around-the-clock stroke coverage, the on-call obligations can become quite burdensome, and for that reason, they may choose not to participate in acute stroke therapy.

What can be done to increase the number of interventional stroke physicians capable of providing on-demand stroke reperfusion therapy? Papanagiotou et al. (13), in this issue of the *Journal*, address the need for additional manpower among interventionalists by including physicians performing carotid artery stenting (CAS). The authors demonstrated the effectiveness of CAS for a high-risk subgroup of acute stroke patients, including those with large-vessel, extracranial carotid artery occlusions. These large-vessel strokes respond poorly to IV t-PA and carry a

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grave prognosis due to their heavy ischemic burden. The authors found that CAS was able to successfully recanalize 95% (21 of 22) of extracranial carotid occlusions with few procedural complications and with good outcomes in 50% of these very sick patients at follow-up. These data confirm 2 other smaller series reporting encouraging results for urgent stroke reperfusion therapy with carotid stents (14,15).

Acute carotid artery occlusive disease causes devastating strokes that do not respond well to IV t-PA, but are amenable to catheter-based therapy with CAS. This invites a larger pool of CAS-capable physicians including cardiologists, radiologists, vascular surgeons, neurosurgeons, and interventional neurologists to join stroke teams (10,16,17). Most of these CAS-capable physicians have not traditionally been included on stroke teams, but including them would spread the on-call stroke coverage over a larger number of providers and improve access to on-demand stroke therapy.

Rather than continuing to fight “turf wars” between specialties, it is time for interventionalists to work together on multispecialty stroke teams led by stroke neurologists (18). American medicine cannot afford to allow political infighting to constrain the number of willing interventionalists from participating in acute stroke care. We can improve access to on-demand stroke therapy with telemedicine systems that allow a stroke neurologist to participate in the care of stroke patients at multiple sites, and we can dramatically increase stroke interventionalists by recruiting CAS-capable providers to the stroke team. The time has come for a patient-focused national quality mandate to improve on-demand access to stroke reperfusion therapy. We did it for heart attacks. Now we need to do it for strokes.

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