CME CREDIT

ONE MINUTE CONSULT

BRIEF QUESTIONS AND ANSWERS ON CURRENT CLINICAL CONTROVERSIES

Q: Should a hospital without a neurologist use t-PA to treat stroke?

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A: ANY HOSPITAL contemplating using tissue plasminogen activator (t-PA, alteplase) to treat acute ischemic stroke should draw up a plan whereby this drug can be given promptly but safely. Smaller hospitals without a physician on call who has adequate neurologic and neuroradiologic expertise might still have this option, but only if their emergency physicians have instant, 24-hour access to such expertise by phone or computer, and formal training on how to recognize the main neurologic contraindications to t-PA: signs of cerebral hemorrhage or extensive early infarction on computed tomography (CT).

TIME IS CRITICAL

Successful treatment of stroke requires a rapid response. The brain is exquisitely sensitive to ischemic injury, and the injury becomes more or less irreversible within 4 to 6 hours after the onset of stroke. The only drug approved for treating acute ischemic stroke, t-PA can dissolve a clot in an occluded artery, restore perfusion, and improve the patient's chances of recovery.[1] However, for t-PA to do any good, it must be given promptly—within 3 hours of the onset of stroke, according to recommendations from the American Heart Association.[2] Currently, fewer than 5% of all acute stroke patients are treated with intravenous t-PA.

RULE OUT CEREBRAL HEMORRHAGE, EXTENSIVE EARLY INFARCTION

On the other hand, if t-PA is given to the wrong patient, it can be lethal. In particular, to receive t-PA, the patient must not have any cerebral bleeding, which can only be detected on CT. The consequences of missing a cerebral hemorrhage on the CT scan are serious.[2] An extensive early infarction also makes the use of t-PA dangerous.

Unfortunately, the radiographic appearance of these conditions can be subtle. In a recent study,[3] emergency physicians did not do well at reading sample CT scans to determine eligibility for t-PA: their average score was 67%, compared with 83% for neurologists and radiologists.

WHAT ARE THE OPTIONS?

Faced with the double challenge of the need to begin treatment quickly while avoiding giving t-PA to the wrong patients,[4] the health care system needs to make some logistical changes. Several options are possible.

Send all patients to a stroke center

One option is for ambulance crews to take all stroke patients to designated "stroke centers"—hospitals that have t-PA protocols in place, round-the-clock access to CT on an instant basis, and 24-hour coverage by expert physicians who can make immediate management decisions and provide follow-up. This approach may be problematic for outlying areas, given the narrow treatment window for intravenous t-PA.

Form a hospital stroke network

Alternatively, smaller and outlying hospitals can affiliate with tertiary referral centers to create a stroke network. Emergency personnel at the outposts could consult specialists at the core facility day or night by phone or computer. The networks would also provide training sessions, and gradually everyone would build up experience and skill. The core facility could always be consulted in situations of doubt or uncertainty.

To give t-PA safely but promptly, hospitals need a plan

This arrangement could be an option even for small hospitals that do not have stroke units or intensive care units for immediate follow-up. In this situation the physician at the satellite center could start the t-PA infusion and then transport the patient to the core facility.

The Cleveland Clinic Health System has such an arrangement. Any physician at a member hospital who has an acute stroke patient can call a pager number to talk to an neurologist at the Cleveland Clinic Cerebrovascular Center, 24 hours a day, 7 days a week. Some of the member hospitals are also connected by teleradiology links to provide CT interpretation. Patients can be treated at the local hospital or transported to the Cleveland Clinic when appropriate (eg, for intra-arterial treatment or neurologic intensive care).

Form a city-wide stroke team

In yet another arrangement, a group of hospitals in the same city could share a mobile stroke team. When paged, the team would drive to the local hospital to perform a consult. This approach was spearheaded by the pivotal National Institute of Neurological Disorders and Stroke t-PA trial at several study sites and certainly helped to facilitate patient management and recruitment.[5]

Hospitals are setting up 'code stroke' teams

In addition, many hospitals are setting up their own acute stroke teams, similar to their code blue teams. These teams are composed of a small group of physicians (including non-neurologists), nurses, and others. Formation of such teams ensures that the center has an expert group of professionals able to diagnose and treat acute stroke.[6]

Create incentives for neurologists to see stroke patients

At present, neurologists are the attending physicians for only 11% of acute stroke patients.[7] The reason is partly financial: neurologists do not receive adequate compensation to leave their offices and provide emergency care. With incentives, these specialists might take over more of this care. However, long-term outcomes need to be monitored to show that this approach is cost-effective.

WHAT NEEDS TO HAPPEN

Health officials, hospital administrations, HMOs, and state and federal agencies need to recognize that widespread use of thrombolytic therapy for patients with acute ischemic strokes could improve outcomes and is cost-effective.[8,9] Then, these individuals, institutions, and agencies need to cooperate in drawing up regional or national plans to meet current and future needs. In particular, we must find the resources to set up the logistical support and infrastructure to ensure:

- Patient education programs
- Rapid response by emergency medical services
- Prenotification to the emergency room to activate the stroke team
- Neurologic expertise to decide on treatment
- Instant initiation of treatment
- Adequate postprocedural observation.

For now, local solutions such as acute telephone consult arrangements as provided within the Cleveland Clinic Health System or alternative strategies may be pursued.

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