Quality improvement program helps lower risk of bleeding, death following stroke

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In a study that included more than 71,000 stroke patients, implementation of a quality initiative was associated with improvement in the time to treatment and a lower risk of in-hospital death, intracranial hemorrhage (bleeding in the brain), and an increase in the portion of patients discharged to their home, according to the study appearing in the April 23/30 issue of *JAMA*, a neurology theme issue.

Intravenous tissue plasminogen activator (tPA; an enzyme that helps dissolve clots) reduces long-term disability when administered early to eligible patients with acute ischemic stroke. These benefits, however, are highly time dependent. Because of the importance of rapid treatment, national guidelines recommend that hospitals complete the evaluation of patients with acute ischemic stroke and begin intravenous tPA therapy for eligible patients within 60 minutes of hospital arrival. However, prior studies demonstrate that less than one-third of patients are treated within the recommended time frame, and that this measure has improved minimally over time, according to background information in the article.

Gregg C. Fonarow, M.D., of the University of California, Los Angeles, and colleagues examined the results of a national quality improvement initiative (Target: Stroke), that was launched to increase timely stroke care. The initiative included 10 key strategies to achieve faster door-to-needle (DTN) times for tPA administration, provided clinical decision support tools, facilitated hospital participation, and encouraged sharing of best practices. This study included 71,169 patients with acute ischemic stroke treated with tPA from 1,030 participating hospitals.

The researchers found that measures of DTN time for tPA administration improved significantly during the postintervention period compared with the preintervention period as did clinical outcomes. The median (midpoint) door-to-needle time for tPA administration for the preintervention period was 77 minutes, which decreased to 67 minutes for the entire postintervention period. Door-to-needle times for tPA administration of 60 minutes or less increased from 26.5 percent to 41.3 percent (and from 29.6 percent to 53.3 percent at the end of each intervention period). Other improvements included in-hospital deaths (9.9 percent to 8.3 percent); discharge to home (38 percent to 43 percent); independence with walking (42 percent to 45 percent); and symptomatic intracranial hemorrhage within 36 hours (5.7 percent to 4.7 percent).

There was also a more than 4-fold increase in the yearly rate of improvement in the proportion of patients with door-to-needle times of 60 minutes or less after initiation of the intervention.

"These findings further reinforce the importance and clinical benefits of more rapid administration of intravenous tPA," the authors write.

In an accompanying editorial, James C. Grotta, M.D., of the Memorial Hermann Hospital, Clinical Innovation and Research Institute, Houston, comments on the two studies in this issue of *JAMA* regarding improving the time of tPA administration for stroke.

"Whatever benefits occur from interventions to achieve more rapid tPA treatment for patients with acute stroke need to be balanced against the costs to establish and maintain them, both to the payers who will pay for them and the hospital and emergency medical services organizations that will implement and operate them. This issue requires carefully constructed cost-effectiveness studies carried out in the environments where the interventions will be implemented; these are likely to differ

between cities in the United States and in other countries and between rural and urban areas."

"The studies by Fonarow et al and Ebinger et al in this issue of *JAMA* indicate exactly where and how to direct efforts in improving treatment outcomes for patients with acute ischemic stroke—namely by reducing time from symptom onset to treatment."

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