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Editor's Note

Long-term Outcomes After Thrombolytic Therapy for Acute Ischemic Stroke

Christopher C. Muth, MD

The role of intravenous thrombolytic therapy in the management of acute ischemic stroke is well established,¹ and faster administration of intravenous tissue plasminogen activator (tPA) has been associated with better short-term outcomes in clinical practice.²

However, it is less certain whether faster time to treatment with thrombolytic therapy is associated with better long-term outcomes, such as long-term survival. Clinical trial data have not demonstrated a long-term mortality



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benefit with thrombolytic therapy, perhaps because trials were underpowered for this outcome.³ Observational data have demonstrated better long-term survival among patients who were treated with thrombolytic therapy vs those who were not, but reports have not included sufficient detail on process measures to explore the relationship between time to treatment (ie, door-to-needle time) and long-term outcomes.⁴ In the US, Get With The Guidelines-Stroke (GWTG-Stroke; a nationwide voluntary registry and quality improvement program) contains the granular process measure data needed for such an analysis; however, long-term follow-up data are generally not collected.⁵

In this issue of *JAMA*, Man et al⁶ linked detailed information about time to treatment from the GWTG-Stroke registry with long-term clinical outcomes ascertained using Medicare claims data to evaluate the association between door-to-needle times and 1-year outcomes for more than 61 000 patients with acute ischemic stroke who were treated with intravenous tPA from 2006 to 2016. The study findings

demonstrated that longer door-to-needle times, compared with more rapid time to treatment, were significantly associated with a higher risk of all-cause mortality, readmission, and a composite of all-cause mortality or readmission at 1 year, although the absolute differences for some of the outcomes were relatively modest. The analyses were generally consistent whether time was analyzed in 15-minute increments or using recommended treatment targets of door-to-needle times of within 45 minutes vs longer than 45 minutes and within 60 minutes vs longer than 60 minutes.

The large number of patients in the study may have allowed for detection of statistically significant associations, but the data set and the study design have some limitations that may affect the generalizability of the findings. First, because of the linkage to Medicare data for outcome ascertainment, the study population included only older adults, with a median age of 80 years. Second, a large number of individuals (n = 41 195) in the GWTG-Stroke registry were excluded from the study because linkage with Medicare claims data was not possible, including a higher proportion of racial/ethnic minorities. Third, patients who received concomitant therapy with intra-arterial reperfusion techniques were excluded to focus the analysis on patients treated solely with intravenous tPA.

Nonetheless, this study fills an important gap in the literature by convincingly documenting the association between faster treatment with intravenous tPA and better long-term outcomes, including 1-year mortality. The findings are yet another reason for clinicians and health systems to design stroke services that can treat patients with acute ischemic stroke with thrombolytic therapy in a rapid fashion.

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Conflict of Interest Disclosures: None reported.

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