Telestroke
Solid support for virtual acute stroke care

IV recombinant tissue plasminogen activator (rtPA) within 4.5 hours of symptom onset has been established as an effective therapy for acute ischemic stroke. Over the past 2 decades, systems of care and quality assurance teams have developed to ensure that all potentially eligible patients receive IV rtPA in a timely and effective manner. Many neurologists cannot arrive rapidly to the emergency department for in-person acute stroke assessment, and many rural areas lack 24/7 coverage by neurologists. Telemedicine has brought neurologic expertise through real-time audiovisual technical link to the emergency department for assessment of patients within the narrow treatment window. Studies have shown that telemedicine (telestroke) is superior to a telephone (only) for acute stroke consultation and decision-making. Patient outcomes from telestroke administration of IV rtPA can rival outcomes from an in-person stroke team treatment. Multiple health economic analyses have demonstrated high cost-effectiveness for telestroke practice and likely cost savings from both the societal and hospital perspectives.

In this issue of Neurology®, Kepplinger et al. aimed to address the question of safety and efficacy of a telemedicine network delivering IV rtPA to patients with acute ischemic stroke. The authors conducted a Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)-confirming systematic review and quantitative meta-analysis of prospective studies, comparing telemedicine-guided IV rtPA to IV rtPA treatment given at stroke centers. They identified 7 studies (2 randomized and 5 non-randomized, prospective, observational studies) with a total of 1,863 individuals fulfilling eligibility criteria. Thrombolysis in the study was largely restricted to the 3-hour time window. The 2 groups had similar symptomatic intracranial hemorrhage rates and no demonstrable difference in morbidity, as assessed by functional independence or mortality at 3 or 6 months. The authors conclude that IV rtPA delivered to patients with acute ischemic stroke in a telestroke network is safe and efficacious within a 3-hour time window.

Strengths of the study include conformance to PRISMA guidelines; study of a clinically important, relevant, and answerable question; explicit eligibility criteria; exhaustive search of bibliographic databases; inclusion of non-English-language studies; adherence to systematic review and meta-analysis steps by multiple independent reviewers; registration of study protocol; use of assessments for publication bias and heterogeneity; justification of selection of random-effects model; and assessment of study quality.

This analysis has limitations, including the relatively low number of published studies on this topic, inclusion of 2 studies reporting data from the same network with an overlapping recruitment period, variation in the definitions of safety and efficacy outcomes across studies, and overall moderately high study methodologic quality.

Have we reached the point of sufficient evidence of safety and efficacy to continue this common clinical paradigm? In the right hands, we believe the evidence is in. An adequate number of studies have demonstrated virtual stroke care as noninferior to on-site stroke care. Telestroke is the expected standard in any acute care facility that cannot mobilize an in-hospital acute stroke team but wants to treat patients with acute ischemic stroke so as to avoid bypassing their hospital.

The American Stroke Association and American Telemedicine Association are addressing telestroke quality, outcomes, and practice guidelines (personal communication with association leadership, 2016), and formal telemedicine training during neurology residency has been proposed recently.

We note that telemedicine in clinical practice has received greater scrutiny than routine face-to-face clinical practice regarding demand for scientific evidence of reliability, validity, accuracy of diagnosis, and decision-making. The time has come to move the research beyond the emergency telestroke assessment and intervention to look at remotely managed stroke patients in the intensive care unit, the stroke unit, and the hospital floor to define stroke mechanisms, initiate secondary prevention, plan adequate rehabilitation, coordinate discharge planning, and prevent readmissions—all with “virtual” confidence.

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REFERENCES


