Letter to the Editor

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Letter by Yang and Bai Regarding Article, “Safety of Intravenous Thrombolysis in Stroke Mimics: Prospective 5-Year Study and Comprehensive Meta-Analysis”

To the Editor:

We read with interest a recent article by Tsivgoulis et al1 on the safety of intravenous thrombolysis (IVT) in stroke mimics (SM). Through both their own institutional data and meta-analysis of 8 published series, the authors found a low risk of symptomatic intracranial hemorrhage among SMs receiving recombinant tissue-type plasminogen activator (tPA). Because tPA does not adversely affect the favorable natural history of SMs, the authors argued that delaying IVT to rule out a stroke mimic is not warranted in terms of safety.

The decision to treat a patient with IVT for acute ischemic stroke (AIS) is often based on the patient’s medical history, clinical presentation, laboratory test results, and computed tomographic (CT) findings because of the limited time window thrombolysis is feasible for AIS. As a consequence, there will always be some patients treated with tPA who have no ischemic stroke but another medical condition mimicking a stroke. Because tPA has been proven safe in these patients, can we accept SM as unavoidable when managing suspected AIS? The answer is no because tPA is an unnecessary, inefficient, and potentially harmful treatment. It is also expensive, especially for patients who have to pay out of their own pockets. In light of this, we would like to ask the following questions:

1. What are the most common diagnoses in patients with SM mistakenly treated with IVT?
2. How can we distinguish SM from AIS in such cases?
3. When should providers obtain additional imaging (magnetic resonance imaging [MRI]-diffusion-weighted imaging, perfusion CT, etc) to rule out SM?

Using the 9 studies included in the meta-analysis of Tsivgoulis et al., we reviewed the most common causes found in SMs receiving IVT. For a total of 8927 patients, 373 (4.2%) were SMs. The percentage of SMs ranged from 1 to 17. The most common cause was seizure (29%), followed closely by conversion disorder (28%) and complicated migraine (19%). However, conversion disorder was the most common cause in 6 of the 9 studies. Patients with SM tended to have a history of psychiatric illness. In 2 studies, the drip-and-ship treatment paradigm was associated with a higher rate of SMs. In the multicenter study by Zinkstok et al including 5581 patients, SMs were treated at later time points compared with true ischemic strokes. In addition, only 2 of 12 centers routinely performed MRI before IVT and another 5 multimodal CT imaging.

Although seizure is associated with postictal paresis, seizures patients frequently have a history of accompanying convulsions. Nevertheless, seizures occur in 9% of patients with stroke. The diagnosis of conversion disorder as a stroke mimic can be challenging. Infarctions of structures in the posterior circulation, especially when involving the thalamic nuclei, can be accompanied by symptoms that may be misinterpreted as psychogenic. Besides demographic features (young and female patients with an identifiable stressor) and history of psychiatric illness, the Hoover sign has been suggested as a useful method to distinguish organic from nonorganic paresis of the leg.4 In the case of a positive Hoover sign, extension of the paretic leg can be felt when the contralateral leg is flexed against resistance.

Guidelines recommend noncontrast CT to rule out intracranial hemorrhage before tPA therapy. The role of additional imaging with MRI-diffusion-weighted imaging and perfusion CT is currently unclear. The common conception is that these imaging modalities are important for the diagnosis of cerebral infarction, but may not be feasible given the time constraints under which AIS must be treated. In addition, the sensitivity of diffusion-weighted imaging for the diagnosis of AIS is not 100%, and a false-negative result is not uncommon during the first 24 hours.5 However, it is important to keep in mind that time delays associated with modern multimodal imaging techniques are getting shorter. Patients with SM were already experiencing a longer time delay than patients with AIS before receiving IVT. Whether this time delay was associated with the use of these imaging modalities or provider indecision remains to be investigated. Similarly, the higher rate of SMs in community hospitals and satellite locations may be associated with the lack of these imaging modalities, but more likely because of the fact that emergency physicians are not as experienced as stroke neurologists in distinguishing SM from AIS.

In conclusion, patients with acute stroke need to be evaluated by physicians experienced in the diagnosis of not only of stroke but also of conversion disorder, migraine, and epilepsy. In such cases, perfusion CT and diffusion-weighted imaging may be helpful to rule out SM before administration of thrombolysis.

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Disclosures

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2. Zinkstok SM, Engelter ST, Ginsicke H, Lyrer PA, Ringleb PA, Artto V, et al. Safety of thrombolysis in stroke mimics: results from a multicenter...


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