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Letter to the Editor

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Rate, Clinical Features, Safety Profile and Outcome of Intravenous Thrombolysis for Acute Ischemic Stroke in Patients With Negative Brain Imaging

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To the Editor

Intravenous (IV) recombinant tissue plasminogen activator (r-tPA) is the only Food and Drug Administration (FDA)-approved pharmacological therapy for acute ischemic stroke (AIS) [1-8]. The exigent time demand for IV r-tPA administration in AIS may not give the necessary time for thorough evaluation in patients presenting with AIS symptoms. As a result, IV thrombolysis of transient ischemic attack (TIA) or conditions mimicking stroke but with a subsequent different diagnosis might occur. In addition, IV r-tPA may sufficiently resolve ischemia such that subsequent brain diffusion-weighted magnetic resonance imaging (DWI-MRI) is negative in some patients. It would be expected that brain computed tomography (CT) scan and the more sensitive DWI-MRI would be negative in all these cases [9-11]. We sought to determine the rate, clinical characteristics, safety profile and outcome of brain imaging-negative patients treated with IV r-tPA for AIS in our large volume comprehensive stroke center, Buffalo General Hospital, Buffalo, NY, USA.

We retrospectively reviewed the medical records and brain imaging of patients who received IV r-tPA for AIS within 4.5 h of symptom onset in a 9.4-year period at our center. A subset of patients with absence of acute infarct/ischemia on their follow-up brain imaging were identified. The 24-h MRI-DWI was available for the majorly of the patients (90.1%). For those who had no follow-up brain MRI due to body size, claustrophobia, presence of metallic implants or foreign bodies, 24-h head CT was reviewed. We recorded age, admission National Institutes of Health Stroke Scale (NIHSS), discharge NIHSS, discharge modified Rankin Score (mRS), symptom onset to treatment time, clinical manifestations, discharge diagnosis and evidence of intracranial hemorrhage (ICH) on follow-up images for these patients.

A total of 637 patients received IV thrombolysis in our center during a 9.4-year period. Thirty-seven (5.8%) were found to have no evidence of acute ischemia/infarct on their follow-up imaging. DWI-MRI was available for 31 patients. Mean age was 65.2 ± 14, mean admission NIHSS was 8 and mean discharge NIHSS was 0. The most common symptom was left-sided hemiparesis in 45% followed by right-sided hemiparesis in 37% of those patients. Table 1 shows the clinical presentations of these 37 patients. The mean time of symptom onset to IV thrombolysis was 2.5 h. Twenty-two (59%) were diagnosed with TIA or averted stroke and the rest had non-vascular stroke mimics. The most common stroke mimics were migraine with aura, seizure disorder and psychogenic disorders (Fig. 1). No patient developed ICH on follow-up brain imaging or any IV r-tPA side effects such as angioedema or systemic bleeding. All patients were functionally independent on discharge, mRS 0 - 1.

IV thrombolysis is generally safe in patients with suspected AIS who have a follow-up negative brain imaging and delaying IV r-tPA administration in cases of doubt is not appropriate. Our results support the previous findings that the use of IV r-tPA appears to be safe in stroke mimics, and prognosis is generally favorable and complications are rather infrequent [9-11]. To the

Table 1. Clinical Presentations

	Non-vascular mimics (n = 15)	Vascular mimics (n = 22)
Left hemiparesis	27.8%	68.4%
Right hemiparesis	55.6%	31.6%
Unilateral paresthesias	5.5%	5.2%
Aphasia	33.3%	15.8%
Dysarthria	5.5%	21.2%
Unresponsiveness	16.7%	5.2%
Headache	11.1%	0%

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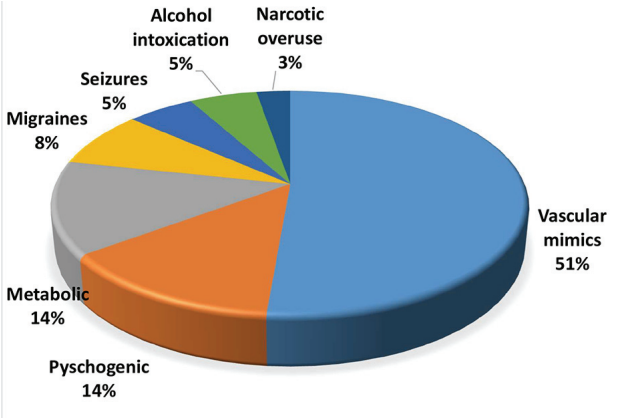

Figure 1. Etiologies of stroke mimics.

best of our knowledge, this is one of the largest reported series of patients with stroke mimics treated with IV r-tPA.

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Conflict of Interest

None to declare.

Informed Consent

Not applicable.

Author Contributions

All authors have contributed to the concept, data collection, data analysis and writing of the article.

Data Availability

The authors declare that data supporting the findings of this study are available within the article.

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