



Seasonal Variation in Presentation and Time to Revascularization Therapy for Acute Ischemic Stroke

AKARSH SHARMA

MARY ROJAS

RUBEN VEGA PEREZ

I. P. SINGH

LAURA STEIN

**Author affiliations can be found in the back matter of this article*

PUBLISHED ABSTRACT



ABSTRACT

Objective: Assess for seasonal variation in patient presentation and time to initiation of revascularization therapy for acute ischemic stroke (AIS).

Background: Rapid revascularization results in improved outcomes, including early neurological improvement as well as functional outcomes at 90 days, for AIS patients. However, restrictive time windows for alteplase (tPA) and endovascular thrombectomy (ET) limit treatment in the majority of AIS patients. Seasonal variation in AIS etiology, severity, patient eligibility for revascularization therapy, and functional outcomes following treatment have been reported in several large cohort studies abroad. However, seasonal variation in stroke presentation and outcomes in an urban northeastern US population is not well known. Moreover, in patients eligible for treatment, it is unclear whether there are seasonal variations in time to treatment, which may impact functional outcomes.

Methods: We retrospectively analyzed AIS patients presenting to the Mount Sinai Hospital (MSH) ED from 2016 to 2018 contained in the American Heart Association's Get With The Guidelines Database. Patients were classified by season of presentation and revascularization modality and primary outcome was door-to-treatment time. Descriptive statistics were used to examine patient characteristics. Non-parametric comparative statistics using Kruskal-Wallis H tests were run between groups to compare door-to-treatment initiation times by season and type of revascularization therapy.

Results: 808 patients presented to the ED for AIS. 28.1% presented during spring (n = 227), 25.7% summer (n = 208), 24.1% winter (n = 195), and 22.0% (n = 178) fall. 14.7% (n = 119) were treated with revascularization therapy, including 57.1% (n = 68) tPA, 26.9% (n = 32) ET, and 16% (n = 19) tPA+ET. Median door-to-treatment time was 60 minutes for tPA, 102.5 minutes ET, and in patients treated with tPA+ET, 55 and 160 minutes for tPA and ET, respectively. Among patients treated with ET,

CORRESPONDING AUTHOR:

Akarsh Sharma

Icahn School of Medicine at
Mount Sinai, US

akarsh.sharma@icahn.mssm.edu

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time-to-treatment differed by season with a mean rank time score in minutes of 9.07 for winter, 13.70 spring, 22.38 summer, and 21.00 fall ($2(3) = 10.2117$, $p = 0.0169$). No significant differences in time-to-treatment were observed by season for patients treated with tPA with or without ET (Table 1).

Conclusions: Over the two-year period of study, ET time-to-treatment was fastest during spring and winter seasons but there was no difference in time-to-treatment with tPA with or without thrombectomy. This may reflect additional experience with stroke systems of care and improved procedural skill over the course of the academic year, but further study is needed.

TREATMENT GROUP	SPRING	SUMMER	FALL	WINTER	X ² (3)
tPA	33.6 (±70.6)	38.3 (±65.9)	35.7 (±73.1)	31.1 (±71.9)	0.76
ET	13.7 (±24.6)	22.4 (±23.9)	21.0 (±20.7)	9.07 (±21.9)	.017*
Dual Therapy tPA	9.35 (±11.8)	8.38 (±9.99)	15.9 (±9.99)	6.88 (±9.99)	0.11
Dual Therapy ET	10.7 (±11.8)	5.75 (±10.0)	12.3 (±10.0)	10.8 (±10.0)	0.38

Table 1 Mean rank score of time-to-treatment by season (stdev), min.

COMPETING INTERESTS

The authors have no competing interests to declare.

AUTHOR AFFILIATIONS

Akarsh Sharma  orcid.org/0000-0001-9654-7155

Icahn School of Medicine at Mount Sinai, US

Mary Rojas  orcid.org/0000-0002-0542-4270

Icahn School of Medicine at Mount Sinai, US

Ruben Vega Perez  orcid.org/0000-0003-0858-4103

Icahn School of Medicine at Mount Sinai, US

I. P. Singh  orcid.org/0000-0002-3939-2879

Department of Neurosurgery, Icahn School of Medicine at Mount Sinai, US

Laura Stein  orcid.org/0000-0002-8268-616X

Department of Neurology, Icahn School of Medicine at Mount Sinai, US

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