IMPROVING ACCESS TO STROKE TREATMENT WITH THE IMPLEMENTATION OF A WAKE-UP AND UNKNOWN SYMPTOM ONSET STROKE PROTOCOL

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OBJECTIVE/AIMS

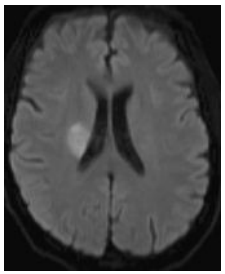
The aim of this project was to increase the rate of thrombolytic therapy by incorporating an additional layer of evaluation within the established acute stroke code process for patients with wake-up stroke (WUS) or unknown symptom onset stroke.

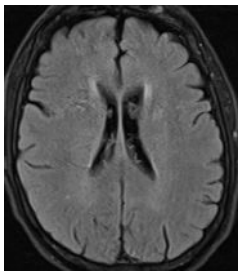
BACKGROUND

Establishing a symptom onset timeline for stroke patients is one of the most important aspects of thrombolytic therapy. Patients who develop acute stroke symptoms can be treated up to 4.5 hours from symptoms onset if all other inclusions/exclusions are met. Unfortunately, in 14 to 27% of patients, the onset of symptoms is unknown leading them to be excluded from treatment. In 2019, the American Stroke Association published Acute Stroke Guidelines supporting the use of magnetic resonance imaging (MRI) for the treatment of WUS and unknown symptom onset stroke patients. Implementing an MRI protocol can potentially increase the rate of thrombolytic therapy and expand treatment to patients who would otherwise be excluded.

METHODS

All patients 18 years of age and older who presented as WUS or unknown symptom onset strokes and were deemed eligible for thrombolytic therapy underwent acute MRI to assist with establishing an onset timeline. Patients who were found to have a diffusion weighted image and fluid attenuated inversion recovery mismatch (DWI-FLAIR Mismatch) on MRI were treated with thrombolytic therapy. The protocol was driven by the nursing staff who were responsible for recognition and activation of the stroke code. The primary outcome examined the relationship between the participants who underwent the MRI protocol and received thrombolytic treatment compared to a similar sample (*N*=44) identified using prior acute stroke data logs from 2019. The primary outcome was evaluated using the chi-square test of independence.





RESULTS

35 patients successfully completed the protocol within the standard acute stroke process. Time metrics were captured and compared to the standard stroke response times (Table 1). 6 patients were treated with thrombolytic therapy. Patients who underwent the MRI protocol had a higher proportion of alteplase (tPA) treatment; X^2 (1, N = 79) = 8.16, p = .006 (Table 2). Safety data around symptomatic intracerebral hemorrhage (sICH) and mortality were collected with no patients having sICH and no deaths.

DISCUSSION

Implementation of a WUS and unknown symptoms onset stroke protocol was successfully carried out in both a large academic center as well as community hospitals. The nursing staff were able to early recognize the potential opportunity for treatment and successfully activate a stroke code. Time metrics seen were similar to standard goals. Limitations for the project included the impact of the COVID-19 pandemic as well as the variability of MRI in house versus on call.

CONCLUSION

Implementation of WUS and unknown symptom onset stroke protocol within an already established acute stroke code process can lead to increased rates of thrombolytic therapy.

Table 1

Independent Samples t-Test Results Comparing Acute Stroke Processes with Standard Goals

Outcome	Received MRI Protocol (N = 35)		Standard Goals				
	M	*SD*	*M*	*SD*	*t*(68)	*p*	*d*
Time from arrival to ED provider	0:06	0:06	0:10	0:00	-4.31	.000	-1.05
Time from arrival to Stroke team	0:23	0:21	0:15	0:00	2.28	.026	0.55
Time from arrival to CT completion	0:24	0:19	0:20	0:00	1.22	.227	0.30
Time from arrival to CT interpretation	0:30	0:22	0:45	0:00	-3.92	.000	-0.95

Note. M = mean; SD = standard deviation; p = statistical significance; tPA = tissue plasminogen activase; U = Mann-Whitney; r = effect size; p = statistical significance.

Table 2.

Chi Square Test of Independence Results Evaluating Outcomes Between the WUS and Unknown Symptom Onset Protocol Group with the Comparison Group

Outcome	WUS/Unknown Symptom Onset Protocol Group (N=35)		Comparison Group (No Protocol) (N=44)				
	n	%	n	%	X^2	*df*	*p*
tPA Administration	6	17.1	0	0	8.16	1	.006
sICH	NA	NA	NA	NA	NA	NA	NA
Mortality	NA	NA	NA	NA	NA	NA	NA

Note. WUS = wake-up stroke; X^2 = chi square; df = degrees of freedom; p = statistical significance; tPA = tissue plasminogen activase; sICH = symptomatic intracerebral hemorrhage.

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