INTERNATIONAL STROKE CONFERENCE 2021 POSTER ABSTRACTS
SESSION TITLE: HEALTH SERVICES, QUALITY IMPROVEMENT, AND PATIENT-CENTERED OUTCOMES POSTERS

Abstract P248: CSC Implementation of Artificial Intelligence Software Significantly Improves Door-In to Groin Puncture Time Interval and Recanalization Rates

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Abstract

Introduction: Viz.ai artificial intelligence (AI) software utilizes AI powered large vessel occlusion (LVO) detection technology which automatically identifies suspected LVO through CT angiogram (CTA) imaging and alerts on-call stroke teams. We performed this analysis to determine if utilization of this AI software can reduce the door-in to groin puncture time interval within the comprehensive care center (CSC) for patients arriving at the CSC for endovascular treatment.

Methods: We compared the time interval between door-in to groin puncture for all LVO transfer patients who arrived at our comprehensive care center for approximately two years prior to and after the implementation of the AI software in November of 2018. Using a prospectively collected database at a CSC, demographics, door-in to groin time, modified Rankin Scale at discharge (mRS dc), mortality rate at discharge, length of stay (LOS) in hospital, mass effect, and hemorrhage rates were examined.

Results: There were a total of 188 patients during the study period (average age 69.26 ± 14.55, 42.0% women). We analyzed 86 patients from the pre-AI (average age 68.53 ± 13.13, 40.7% women) and 102 patients from the post-AI (average age 69.87 ± 15.75, 43.1% women); see Table 1 for comparison of baseline characteristics and outcomes. Following the implementation of the AI software, the mean door-in to groin puncture time interval within the CSC significantly improved by 86.7 minutes (206.6 vs 119.9 minutes; $p < 0.0001$); significant improvements were also noted in the rate of good recanalization (mTICI 2B-3) for patients in the post-AI population ($p=0.0364$).

Conclusion: The incorporation of the AI software was associated with a significant improvement in treatment time within the CSC as well as significantly higher rates of good recanalization for patients treated. More extensive studies are warranted to expand on the ability of AI technology to improve transfer times and outcomes for LVO patients.

Table 1. Baseline demographics, clinical characteristics, and outcomes of ischemic stroke patients who underwent thrombectomy prior to and after the implementation of AI software.

Characteristics	Outcomes		P value
	Pre-AI Software (N=86)	Post-AI Software (N=102)	
Age (mean ± SD)	68.53 ± 13.13	69.87 ± 15.75	0.525
Gender			0.736
Men	51 (59.3%)	58 (56.9%)	
Women	35 (40.7%)	44 (43.1%)	
Race/Ethnicity			0.391
White	16 (18.6%)	26 (25.5%)	
Hispanic	68 (79.1%)	78 (76.5%)	
African American	1 (1.2%)	0 (0.0%)	
Asian	1 (1.2%)	0 (0.0%)	
NIHSS upon admission	16.13 ± 8.33	15.91 ± 7.10	0.847
IV tPA Use at Spoke	31 (36.0%)	35 (34.3%)	0.804
Co-Morbid Conditions			
Diabetes mellitus	45 (52.3%)	51 (50.0%)	0.751
Hypertension	69 (80.2%)	81 (79.4%)	0.889
Atrial fibrillation	19 (22.1%)	21 (20.6%)	0.801
History of Stroke/TIA	23 (26.7%)	24 (23.5%)	0.612
Coronary Artery Disease	17 (19.8%)	31 (30.4%)	0.096
Cigarette smoking	7 (8.1%)	9 (8.8%)	0.867
Time Intervals, Mean ± SD			
Door-in to Groin, minutes	206.6 ± 169.1	119.9 ± 83.0	< 0.0001
Thrombolysis in Cerebral Infarction			
Good (post TICI 2B-3)	73 (84.9%)	96 (94.1%)	0.0364
Poor (post TICI 0-2A)	13 (15.1%)	6 (5.9%)	0.0364
In-hospital complication			
Symptomatic intracerebral hemorrhage	7 (8.1%)	6 (5.9%)	0.543
Asymptomatic intracerebral hemorrhage	2 (2.3%)	5 (4.9%)	0.353
Hemorrhagic Transformation	6 (7.0%)	13 (12.7%)	0.191
Mass Effect	12 (14.0%)	5 (4.9%)	0.0311
Outcome			
Good (mRS dc score 0-2)	24 (27.9%)	26 (25.5%)	0.709
Poor (mRS dc score 3-6)	62 (72.1%)	76 (74.5%)	0.709
Length of Stay, Median [IQR]			
Admission to Discharge	7 [4-11]	7.5 [4-12]	0.103
Mortality at Discharge	18 (20.9%)	23 (22.5%)	0.789

Abbreviations: SD, standard deviation; NIHSS, NIH Stroke Scale; TICI, thrombolysis in cerebral infarction; mRS, modified Rankin Scale; TIA, trans ischemic attack; Significance Level: 0.05