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RACE Score-Based Hospital Bypass Protocol Improves Treatment Time Efficiencies

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Introduction

Evaluation of stroke patients using the RACE scale has been shown to predict large vessel occlusion (LVO) prior to hospital arrival (1). We examined whether pre-hospital identification of stroke patients with suspected LVO and bypass to an endovascular capable center (ECC) is associated with improved clinical outcomes.

Methods

We conducted retrospective review of consecutive patients who underwent mechanical thrombectomy (MT) and were initially triaged by local county Emergency Medical Services (EMS) before and after implementation of a bypass protocol based on the RACE score. Between June 2013-July 2015, patients were first triaged to the closest stroke center and later transferred to an endovascular capable center (ECC) for MT (SA group). EMS personnel in Lucas County underwent rigrous training to evaluate patients on the field using the RACE score. After July 2015, all patients with a RACE score >5 were triaged directly to an ECC (RA group). Basic demographics, risk factors, EMS activation to treatment, and outcomes were compared. Favorable outcome is defined as a mRS score of 2 or less at 90 days.

Results				
	SA (n=56)	RA (n=68)	P-value	
Admission NIHSS (median, IQR)	18 (13-21)	16.5 (13-21)	0.78	
ASPECTS (median, IQR)	9 (8-9)	9 (8-9)	0.89	
Left sided	29 (51.8)	37 (54.4)	0.86	
IV TPA	22 (39.3)	38 (55.9)	0.07	
Dispatch to Arrival	34 (30-38)	30 (26-37)	0.04	
Door to groin (median, IQR)	76 (48-99)	66 (54-78)	0.28	
Door to Recanalization	117 (86-172)	94 (80-114)	0.008	
EMS Activation to Groin	173 (128-205)	<mark>96 (81-114)</mark>	<0.0001	
EMS Activation to Recanalization	<mark>221 (191-282)</mark>	<mark>123 (106-149)</mark>	<mark><0.0001</mark>	
LKN to groin puncture	217 (175-358)	135 (109-376)	0.004	
Successful Recanalization	39 (69.6)	55 (80.9)	0.21	
Onset to first ER arrival	98 (52-226)	77 (40-427)	0.928	
Second Hour	3 (5.4)	22 (32.4)	< <u>0.0001</u>	

Table 1: Comparison of measures between patients who underwent the original stroke alert protocol versus the newly implemented RACE alert protocol. Significant findings include improved EMS activation to groin puncture time and improved EMS activation to recanalization time.

0.	inical Outcomes at 50 Days			
	RACE ALERT (RA) 2015- 2017 N=68	STROKE ALERT (SA) 2013-2015 N=56 33/56 Direct to CSC 23/56 to outside ER first	P-value	
Favorable outcome at 90 days, mRS ≤2. N(%)	33 (48.5%)	21 (37.5%)	0.21	
Excellent outcome at 90 days, mRS <u><1</u> . N (%)	24 (35.3 %)	12 (21.4%)	0.11	
Mortality at 90 days	14 (20.6%)	12 (21.4 %)	1.0	

Results

Between June 2013 and July 2017, 124 patients (SA= 56, RA= 68) that underwent MT were identified. The two groups were comparable with regards to baseline characteristics, presentation NIHSS, ASPECT score and IV tPA pretreatment. The RA group had significantly faster EMS activation to ECC arrival (RA=77 vs. SA=141, p=0.03) and EMS activation to recanalization times (123 vs. 220.5 min, p<0.01). A non-significant trend towards a higher rate of favorable outcome in the RA cohort was noted (RA=48.5 vs SA=37.5, p=0.2).

Conclusions

Direct field triage of suspected LVO patients with the RACE scale is associated with faster EMS activation to recanalization time and may lead to improved clinical outcomes. Further studies are necessary to understand the generalizability of this approach.

Learning Objectives

By the conclusion of this session, participants should be able to:

1.) Describe the role of the RACE scale in evaluating stroke patients prior to hospital arrival

2.) Discuss the association between RACE scores and mechanical thrombectomy outcomes

3.) Understand the value of the RACE score-based hospital bypass protocol in improving patient outcomes

References

 De la Ossa NP, et al. Stroke 2014;45:87-91.
Zaidi SF, et al. J NeuroIntervent Surg 2016;0:1-5. doi:10.1136/neurintsurg-2016-012476.