

NEUROLOGY

Novel Large Vessel Occlusion Stroke Identification Scale in the Pre-hospital Setting

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Objective: To develop a scale used by EMS in the pre-hospital setting to better identify large vessel occlusion (LVO) stroke patients.

Background: With the proven effectiveness of thrombectomy within 24 hours of stroke onset, a short scale composed of clinical presentations used by EMS to identify potential LVO stroke patients who are prime candidates for thrombectomy is urgently needed. So far there are several scales being used but none of them have shown consistently high sensitivity and specificity. A possible contributing factor is that all available stroke scales incorporate only positive scale values in identifying LVO based on clinical presentation consistent with LVO such as cortical signs. No scale has incorporated negative scale values for common presentations of non-LVO stroke subtypes such as embolic strokes and small vessel strokes or mimics. We hypothesize that a scale using differentially weighted positive and negative scale values may help to better identify LVO stroke from other stroke subtypes.

Methods: This is a retrospective chart review analysis of 148 patients evaluated for stroke between January 2017–May 2018 at a regional medical center with imaging confirmed stroke. Stroke scale scores were calculated from patients' initial NIHSS and presentation upon ER arrival, using the C-STAT stroke scale findings for comparison.

Results: C-STAT stroke scale had a sensitivity of 66.7% and a specificity of 73.0% in differentiating LVO from other stroke subtypes. Compared to C-STAT, our scale showed a significantly higher sensitivity of 93.8% ($p < 0.001$) and a non-significantly increased specificity of 81.0% ($p = 0.084$).

Conclusion: Findings suggest that our new scale may allow for a more accurate determination of LVO stroke in the pre-hospital setting without significant delay. A prospective, larger patient cohort in a pre-hospital setting is needed to validate these findings.