Prognostic value of combining 24-hour ASPECTS, and hemoglobin to red cell distribution width ratio on the THRIVE-score in predicting in-hospital mortality among ischemic stroke patients treated with intravenous thrombolysis.

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DISCLAIMER

The authors have no conflicts of interest directly relevant to the content of this article.

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ABSTRACT

Background:
Acute ischemic stroke (AIS) emerges as a significant global health issue, directly impacting mortality and disability. The Total Health Risk In Vascular Events (THRIVE) score, appreciated for its simplicity and ease of use, consistently validates its ability to accurately predict stroke clinical outcomes. However, the THIRVE score is currently lacking laboratory and neuroimaging data, which limits its ability to provide precise prediction of stroke outcomes. Our study evaluates the impact of integrating the 24-hour Alberta Stroke Program Early CT Score (ASPECTS) and hemoglobin-to-red cell distribution width (HB/RDW) ratio into the THRIVE score using the multivariable fractional polynomial (MFP) method (combined THRIVE-MFP) compared to the THRIVE-c model. We aim to assess their added value in predicting in-hospital mortality (IHM) prognosis.
Methods: A retrospective study from January 2015 to July 2022 examined consecutive AIS patients receiving intravenous thrombolysis. Data on THRIVE scores, 24-hour ASPECTS, and HB/RDW levels were collected upon admission. The model was constructed using logistic regression and the MFP method. The prognostic value was determined using the augmented area under the receiver operating characteristic (AuROC). Ischemic cerebral lesions within the middle cerebral artery territory were evaluated with non-contrast computed tomography (NCCT) following 24 hours of intravenous thrombolysis completion (24-hour ASPECTS).
Results:
Among a cohort of 345 patients diagnosed with AIS who received intravenous thrombolysis, 65 individuals (18.8%) experienced IHM. The combined THRIVE-MFP model was significantly superior to the THRIVE-c model (AuROC 0.980 vs. 0.876, $P<0.001$).
Conclusion:
The combined THRIVE-MFP model showed excellent predictive performance, offering potential for guiding treatment decisions and enhancing healthcare outcomes. Incorporating 24-hour ASPECTS on NCCT and HB/RDW proved valuable in IHM prediction, particularly for hospitals with limited access to advanced neuroimaging resources.

ATTACHMENTS

Protocol.pdf

1 Prognostic value of combining 24-hour ASPECTS, and hemoglobin to red cell distribution width ratio on the THRIVE-score in predicting in-hospital mortality among ischemic stroke patients treated with intravenous thrombolysis