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IER-START nomogram for prediction of three-month unfavorable outcome after thrombectomy for stroke

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Abstract

Background

The applicability of the current models for predicting functional outcome after thrombectomy in strokes with large vessel occlusion (LVO) is affected by a moderate predictive performance.

Aims

We aimed to develop and validate a nomogram with pre- and post-treatment factors for prediction of the probability of unfavorable outcome in patients with anterior and posterior LVO who received bridging therapy or direct thrombectomy <6 h of stroke onset.

Methods

We conducted a cohort study on patients data collected prospectively in the Italian Endovascular Registry (IER). Unfavorable outcome was defined as three-month modified Rankin Scale (mRS) score 3–6. Six predictors, including NIH Stroke Scale (NIHSS) score, age, pre-stroke mRS score, bridging therapy or direct thrombectomy, grade of recanalization according to the thrombolysis in cerebral ischemia (TICI) grading system, and onset-to-end procedure time were identified a priori by three stroke experts. To generate the IER-START, the pre-established predictors were entered into a logistic regression model. The discriminative performance of the model was assessed by using the area under the receiver operating characteristic curve (AUC-ROC).

Results

A total of 1802 patients with complete data for generating the IER-START was randomly dichotomized into training ($n = 1219$) and test ($n = 583$) sets. The AUC-ROC of IER-START was 0.838 (95% confidence interval [CI]: 0.816–0.869) in the training set, and 0.820 (95% CI: 0.786–0.854) in the test set.

Conclusions

The IER-START nomogram is the first prognostic model developed and validated in the largest population of stroke patients currently candidates to thrombectomy which reliably calculates the probability of three-month unfavorable outcome.

