Comparison of predictive scores for symptomatic intracerebral hemorrhage after intravenous thrombolysis in Thai stroke patients

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Abstract

Background and Objective: Intravenous thrombolysis treatment is the standard treatment for acute ischemic stroke, however it carries a significant risk of intracerebral hemorrhage with resulting poor clinical outcome. There are several scoring systems for predicting the risk of symptomatic intracerebral hemorrhage (sICH) after thrombolysis. In this study, we aimed to determine whether these risk scores could be used to predict sICH after intravenous thrombolysis in Ramathibodi hospital.

Methods: Clinical data was analyzed from consecutive patients (n = 103) receiving IV rtPA treatment from January 2008 to December 2013 at Ramathibodi Hospital. Six scores were calculated for each patient: Cucchiara score, HAT score, DRAGON score, SEDAN score, SITS-SICH risk score and SPAN-100 index.

Symptomatic intracerebral hemorrhage was defined according to the NINDS study criteria. We calculated the area under the receiver operating characteristic curve (AUC-ROC) and also performed logistic regression and the Hosmer-Lemeshow statistics.

Results: sICH occurred in 18 patients (20.7%) after IV thrombolysis treatment. Only 4 scores predicted sICH with good ability to discrimination (area under ROC ≥ 0.7): HAT, 0.84 (95% confidence interval, 0.72–0.96); DRAGON, 0.79 (0.69–0.89); SEDAN, 0.77 (0.66–0.88) and Cucchiara, 0.72 (0.60–0.83). HAT yielded the highest area under the ROC curve compared with all other scores while SPAN-100 index, 0.54 (0.38–0.69) performed the worst.

Conclusions: The HAT, DRAGON, SEDAN and Cucchiara score were reasonably predictive of sICH after IV thrombolysis in this study. However, the HAT score had the best ability to discrimination while the SPAN-100 index had the worst predictive ability.

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Keywords: acute ischemic stroke, intracerebral hemorrhage, intravenous thrombolysis, risk score