The Predictive Risk Score of Intracerebral Hemorrhage in Acute Ischemic Stroke Patients Receiving Intravenous Recombinant Tissue Plasminogen Activator (IV rt-PA) : A retrospective study

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Introduction

- Thailand experiences rising of stroke incidences with 171,419 people suffering from stroke in 2011.
- Acute ischemic stroke (AIS) normally causes many neurological sequelae leading to disabilities and death.
- IV rt-PA was approved by the FDA to be the only treatment for acute ischemic stroke since 2006.
- In America and Canada, at least 5 different scores were reported including PRS, the HAT Score, GRASPS, SPAN-100 and iScore in the same population but different part of country
- In 2017, Lokeskrawee and colleges developed SICH score from North and Northeast of Thailand.

Methods

- All patients with acute ischemic stroke who eligible for IV rt-PA treatment and also were admitted at Songkla-nagarind Hospital between January 2010 and June 2017
- Dosing of IV rt-PA were either 0.6-0.9 mg/kg according to the current Thai guideline.
- All patients underwent computed tomography (CT) or Magnetic Resonance Imaging (MRI) at 24 hours after thrombolysis.
- One neuroradiologist was blinded to read the CT and The Alberta stroke program early CT score (ASPECT)

Objectives

- In this study, we aimed to develop the practically predictive risk score of ICH in patients with acute ischemic stroke receiving IV thrombolysis at the South of Thailand

Results

- One hundred and forty- two patients with diagnosis of AIS and received intravenous thrombolysis were included in this study. Thirty –two patients (22%) had intracranial hemorrhage (ICH); twenty-four were SICH and eight were asymptomatic ICH (AICH)
- There are five significant predictors of ICH occurrence after IV rt-PA included National Institute of Health Stroke Score (NIHSS) at arrival, systolic blood pressure before given rt-PA, history of old cerebrovascular disease (CVA), the history of atrial fibrillation and platelet count (p value <0.05).
- Multiple logistic regression analysis showed only four independent factors including NIHSS, SBP, history of old CVA and platelet count were used to calculate the predictive risk score and simplified the score as below

$$\text{Simplified Predicted Score} = [2 \times (\text{SBP})] + [9 \times (\text{NIHSS})] + [174 \times (\text{Old CVA})]$$

Figure1 : the ROC curve of the predictive risk score (AUC = 0.71)

Table 1: Cut off score of clinical risk score index

Cut-off	Sensitivity	Specificity	PPV	NPV
> 350	96.87	23.64	27.0	96.3
> 365	90.62	28.18	26.9	91.2
> 370	84.37	30.00	26.0	86.8
> 380	81.25	38.18	27.7	87.5
> 391	75.00	44.55	29.1	87.5

Conclusions

- Calculating a risk score can identify patients at higher risk of ICH after IV rt-PA, which is an easy and practical tool to facilitate clinical decision making. Therefore an intensive monitoring program should be considered in high-risk AIS patients after receiving IV rt-PA.