Predicting the occurrence of venous thromboembolism: construction and verification of Risk Warning Model

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Abstract

Background: The onset of venous thromboembolism is insidious and the prognosis is poor. In this study, we aimed to construct a VTE risk early warning model and explore the clinical application value of the VTE risk early warning model.

Methods: Preliminary construction of the VTE risk warning model was carried out according to the independent risk warning indicators of VTE screened by Logistic regression analysis in previous studies. The truncated value of screening VTE was obtained and the model was evaluated. ROC curve analysis was used to compare the test performance of Caprini risk assessment scale and VTE risk warning model on VTE. The validation data set was established, and the cut-off value of the VTE risk warning model was used to evaluate the test effectiveness of the model for VTE patients with validation data set.

Results: The VTE risk warning model is $p = e^x / (1 + e^x)$, $x = -4.840 + 2.557 \cdot X10(1) + 1.432 \cdot X14(1) + 2.977 \cdot X15(1) + 3.445 \cdot X18(1) + 1.086 \cdot X25(1) + 0.249 \cdot X34 + 0.282 \cdot X41$. ROC curve results show that: AUC (95%CI), cutoff value (95%CI), accuracy, Youden index (95%), sensitivity, specificity and other evaluation indexes, Caprini risk assessment scale is 0.596 (0.552, 0.638), > 5 (> 4, > 5), 61.3%, 0.226 (0.167, 0.290), 26.07%, 96.50%, VTE risk warning model is 0.960 (0.940, 0.976), > 0.438 (> 0.263), respectively. >, 0.504), 92.2%, 0.844 (0.789, 0.879), 92.61%, 91.83%, with statistically significant differences (Z=14.521, P < 0.0001). The accuracy and Youden index of VTE screening using VTE risk warning model were 81.8% and 62.5%, respectively.

Conclusions: VTE risk warning model has high accuracy in predicting the occurrence of VTE in hospitalized patients, and its test performance is higher than Caprini risk assessment scale. It also has high test performance for VTE in external population.

Full Text

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Table

Due to technical limitations, table 1 is only available as a download in the supplemental files section.
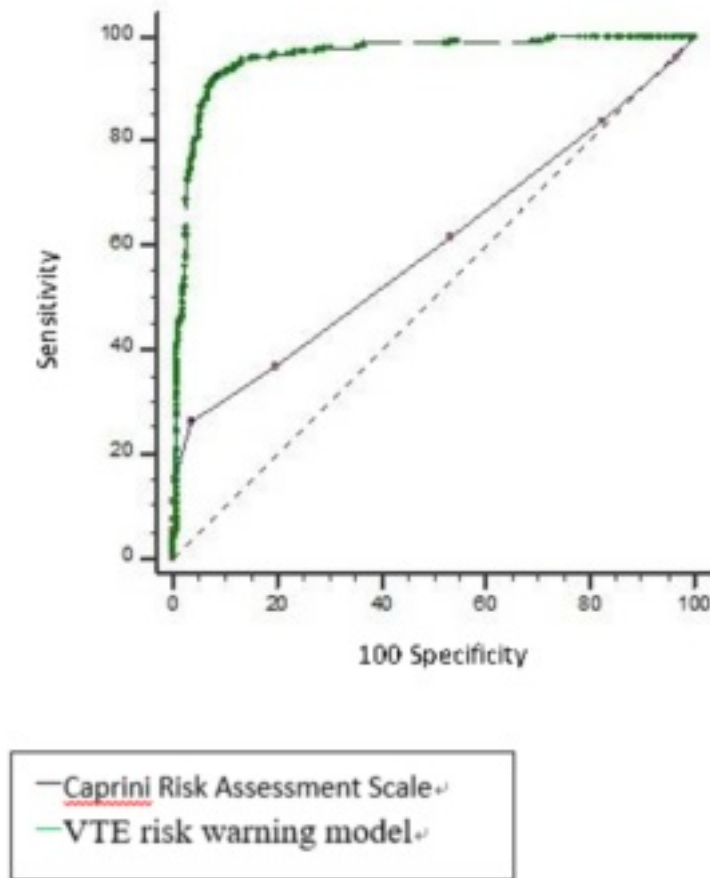
Figures

Figure 1

Comparison of ROC curves of VTE screening by Caprini risk assessment scale and VTE risk

warning model

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