Prognostic Prediction Model of Severe Trauma Patients – using Japanese Nationwide Trauma Registry

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Abstract

Objective: We aimed to create a new prognostic prediction score model for severe trauma patients by using the Japanese nationwide trauma registry, which is focused on patient transportation time, the treatment provided by emergency medical services, and the variations in the vital signs of the patients before and after arrival at the hospital.

Methods: A multicenter retrospective cohort study was conducted in Japan. We collected data from the Japan Trauma Data Bank (JTDB) . We included the words “adult” and “shock” (systolic blood pressure < 90 mmHg) in our search, and then considered age, sex, treatment before hospital arrival, variations in the vital signs and transportation time. The outcome was the status at hospital discharge (dead/alive). A stepwise logistic regression model was constructed for the model development and the bootstrapping method was used for internal validation.

Results: A total of 4,881 patients were included, and mortality was 10.5%. According to multivariate analysis, predictors for death included age (4 categories), type of injury (2 categories), treatment before hospital arrival (2 categories), variation in systolic blood pressure (6 categories), variation in respiratory rate (5 categories) and transportation time (2 categories). The AUC (area under the receiver operating characteristic curve) was 0.726 (95% CI, 0.702 – 0.749). Our prediction model was validated internally by a bootstrapping method.

Conclusion: We suggest a new prognostic prediction model for severe trauma patients that consists of six predictors and is focused on variations in vital signs. This score can be calculated just after the patient’s arrival at the hospital.