A new Utstein-based model score to predict survival to hospital admission: the TICINUM score

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Topic(s):
Management of Out of Hospital Cardiac Arrest

Citation:
Background: The prediction of the possibility of return of spontaneous circulation (ROSC) in the individual patient is one of the major challenges confronting resuscitation science. The RACA score has been proposed to predict the achievement of a ROSC longer than 20 seconds in field (out-of-hospital, OH). However, no score exists to predict a ROSC sustained until arrival at the emergency department, using the standardized Utstein-based categorization of variables.

Purpose: to create a new Utstein-based score to predict the survival to hospital admission of an OH cardiac arrest (CA) victim.

Methods: we performed a retrospective analysis of all prospectively collected OHCAs occurred between 2015 and 2017 in two regions, one in northern Italy and the other in southern Switzerland. All consecutive patients who suffered an OHCA of any aetiology between 01/01/2015 and 31/12/2017 in whom CPR was attempted were included. We used random effect logistic regression to model survival to hospital admission after an OHCA. We included the same variables used in the RACA score, re-categorized following Utstein recommendations. For model validation, we computed the model area under the ROC curve (AUC ROC) for discrimination. We derived the TICINUM score using the coefficients estimated in the regression model (multiplied by 10 and rounded to the nearest integer). We plotted the score against the probability of hospital ROSC.

Results: 1961 patients were included in our analysis (62% males, mean age 73 ± 16 years old). Age, aetiology, witnessed OHCA, site of OHCA, time of EMS arrival and shockable rhythm were independently associated with survival to hospital admission. The model showed a good discrimination (AUC 0.83, 95%CI 0.81-0.85) for predicting survival to hospital admission. The model variables and their odd ratios are presented in Figure 1 (left). The score value is obtained summing a coefficient calculated for each variable. The nomogram of the probability of survival to hospital admission associated to the different score values is presented in the Figure 1 (right).

Conclusion: The TICINUM score is a new score, which allows to predict with good discrimination the probability of survival to hospital admission of an OHCA victim. The simple calculation and the fact that it is Utstein based makes it easily applicable by EMS personnel during an OHCA scenario.
Abstract:

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