Journal of Statistics on Health Decision

EXTENDED ABSTRACT

Mortality prediction scores in burn patients – a comparative analysis

Gonçalo Tomé[1], Luís Cabral[1,2], José M. Azevedo[1], Inês Catalão[1], Vera Afreixo[2]

[1]Department of Plastic Surgery and Burns Unit, Coimbra University Hospital Centre (CHUC), Av. Bissaya Barreto s/n, 3000-075 Coimbra, Portugal
[2]Autonomous Section of Health Sciences (SACS), University of Aveiro, Aveiro, Portugal

Introduction:

The aim of this study was to assess and to compare the accuracy of different mortality prediction models used in the burn population from a tertiary Burn Unit (BU), taking in account the clinical and demographic characteristics.of survivors and non-survivors.

Methods:

A retrospective study of adult burn patients admitted to a BU in a 5-year period was performed. Toxic epidermal necrolysis and polytraumatized patients were not included. Mortality rate was assessed. Survivors and non-survivors clinical and sociodemographic characteristics were analyzed and compared. Four models were included, namely Abbreviated Burn Severity Index (ABSI), Belgian Outcome in Burn Injury (BOBI), revised-Baux and Ryan model. Observed and predicted mortality were compared using Hosmer-Lemeshow test for models goodness-of-fit, receiver operating curves (ROC) and area under curve (AUC) for discriminative performance evaluation.

Results:

The sample was composed by 641 patients, from which 58,2% were male. Patients mean age was 60.02 ± 18.97 years and total burned surface area (TBSA) was 12.94 ± 15.11 %. Third degree burns were present in 71% and inhalation injury in 12.3%. Observed mortality rate was 9.4% (n=60). Non-survivors were significantly older (73 vs. 60 years; $p<0.001$), had a larger TBSA (27.75 vs. 7%; $p<0.001$), higher frequency of third-degree burns (96.7 vs. 68.3%; $p<0.001$) and inhalation injury (31,7% vs. 10,3%; $p<0.001$), but no gender significant difference was verified. All models demonstrated an adequate goodness-of-fit, all with p-values >0.05 in Hosmer-Lemeshow test assessment. Revised-Baux (AUC 0.870 ± 0.025), ABSI (AUC 0.850 ± 0.026) and BOBI (AUC 0.831 ± 0.026) have demonstrated good discriminative power and Ryan model (0.774 ± 0.030) was only moderate.

Discussion:

The four models revealed proper predictive performance, with revised-Baux presenting as the most accurate model for mortality prediction. Their use in the BU represents a practical and valuable tool for risk stratification, treatment appropriateness and improve the burns care quality control.

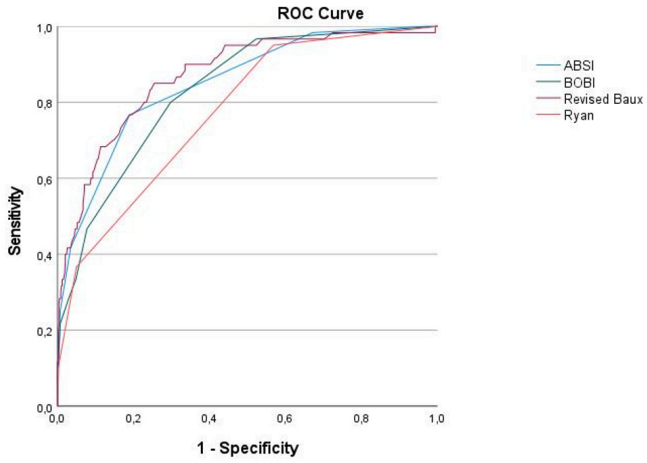

Figure 1 - Mortality Prediction Models ROC Curve

Keywords:
Burns, Mortality, Injury Severity Score

Corresponding author:
Gonçalo Tomé
goncalo.ltcf@gmail.com

Conflict of interest:
The authors declare no conflict of interests

First published: 20JUL2022