

Comparing the Real Outcome to the Probability for that Outcome by Generation of a Computer Model: a Minimum Standard of Burn Survival

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Abstract

Background: Survival following burn injury has increased not only in developed countries over the past 20 years which is reflected with improvements in Lethal Area 50(LA50) or the burn size in which 50% of patients survive.

Aims: The aim of this study is to analyze mortality through LA50 and develop an objective predictive probability model for outcome in major burn patients based on age and BSA(%) which will help us to identify the patients with bad prognosis in order to help them during the course of the disease.

Study design: The study was retrospective clinical and analytical regarding outcome after severe burns. The data used are obtained by the analysis of the medical records of 5033 patients

hospitalized with burns in the ICU of the service of burns and plastic surgery near UHC in Tirana, Albania during 1992-2019.

Methods: SPSS 23 software was used for the conduction of the statistical analysis. We have used Inferential Statistics through probability theory to draw conclusions. Concretely Simple Linear Regression for estimating Lethal Area 50 (LA 50), Binary logistic regression for creating the death probability chart. Statistical significance was defined as $p < 0.05$.

Results: In the 28-year period, 5033 patients were admitted to Intensive Care Unit. Mean age (SD) was 20 (23.4) years old. Mean (SD) body surface area burn was 23.9 (16.9) %. Mortality was 12.3%. The mean LOS (Length of Hospital

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Stay) was 11.1 ± 2.1 days while LOS in deaths was 8 ± 10.7 days. LA 50 was improved in the last decade arriving 82.2%. From Logistic regression equation we calculate the death probability from 0-100% and present it as a surface contour chart.

Conclusion: There was a significant decrease in mortality in the last two decades which suggest major efforts have been made in burn care in Albania. We have developed a predictive model for mortality in major burn patients based only in age and burn size. Our opinion is that it is the responsibility of the burn team to continuously refresh and improve the probability chart in order to compile a chart after each year which should serve as a more accurate predictor for the patients of the following year. The probability for survival that the model assigns to the patients is the minimum standard because it is necessary to include in the model many other factors. The improvements in burn mortality should produce changes in the expectations of the burn care providers.

Key Words: Burns, Mortality, Death probability