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Comparison between prognostic values of SOFA, APACHE II and SAPS II scores in patients with Aluminum phosphide poisoning

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Objective: Aluminum phosphide (AIP) is a toxic agent with high mortality rate. Acute Physiology and Chronic Health Evaluation II (APACHE II), Simplified Acute Physiology Score (SAPS II) and Sequential Organ Failure Assessment (SOFA) scoring systems are widely used in intensive care units (ICUs) to predict patient outcomes. In the field of medical toxicology, the performance of these systems in the prediction of AIP-poisoned patient outcomes has been evaluated in only a few published studies. The aim of this study is to identify more specific and sensitive scoring systems for outcome prognostication in these patients.

Methods: In this prospective study all patients with AIP poisoning from 2010-2015 in Ardabil, Iran were enrolled. Clinical data, scoring systems and clinical outcome were compared between fatal and non-fatal cases using univariate analysis (Mann-Whitney or t-test), multiple logistic regression, ROC curve analysis, and Pearson correlation test.

Results: Sixty-eight AIP poisoning patients were included, of whom 36 (52.9%) died. The mean APACHE II scores were 4.81 ± 2.96 and 11.61 ± 3.24 in non-fatal and fatal groups, respectively. There was a correlation between SAPS II Score and systolic blood pressure (SBP), pH, HCO_3 (P-value < 0.05); additionally, there was significant Pearson correlation between APACHE II and length of hospital stay, SBP, pH, HCO_3 (P-value < 0.05). Using the multiple logistic regression analysis model it was determined that 4 factors were significant for predicting mortality including: GCS (OR (95%CI): 0.24 (0.09-0.63), p=0.003), SBP (OR (95%CI): 0.91 (0.84-0.97), p=0.006), UOP (OR (95%CI): 0.99 (0.98-0.99), p=0.04) and HCO_3 (OR (95%CI): 0.7 (0.56-0.93), p=0.01). Moreover, the death rate rises 0.91 times per unit of SBP increase. APACHE II, SAPS II and SOFA Score best cut-off point between non-fatal and fatal cases were found to be 8.5, 24.5 and 7.5 respectively.

Conclusion: The results of our study showed that SBP, GCS, UOP and serum HCO_3 levels are the best prognostic factors of mortality in AIP poisoned patients. According to the area under the ROC curve the APACHE II score can better predict outcome when compared with SOFA and SAPS II.