Application of the Sequential Organ Failure Assessment (SOFA) Score in Comparison to Acute Physiology and Chronic Health Evaluation (APACHE III) Score to Patients with Cancer Admitted to the Intensive Care Department

Abstract

Introduction*:* Prognostic models, such as Sequential Organ Failure Assessment (SOFA) Score, and the Acute Physiology and Chronic Health Evaluation (APACHE) III were developed to quantify the severity of illness and the likelihood of hospital survival for a general intensive care unit (ICU) population. Little is known about the performance of these models in specific populations, such as patients with cancer.

Objective*:* The aim of present study was to describe the utility of the Sequential Organ Failure Assessment score in assessing the severity of organ dysfunction and compared to Acute Physiology and Chronic Health Evaluation (APACHE III) in patients with cancer patient admitted to the intensive care unit.

Methods

Design: Prospective cohort study.

***Setting*:** Eighty patients (in Critical Care Department, Cairo University, Egypt) included in eight month (October 2009 to May 2010) for an acute medical complication. They were divided into two groups. Group (1) included 50 patients having malignancy and group (2) included 30 patients with no malignancy. All had eligibility criteria of multiorgan failure.

Interventions: None.

***Measurements*:** the worst variables included in the APACHE III and SOFA scores were collected during date of admission and follow up in the first 24 hrs of the ICU stay. Discrimination was determined by the area under the receiver-operating characteristic curve (AUC). Calibration was calculated using the Hosmer-Lemeshow goodness-of-fit test. The following variables were collected: age, gender, duration of mechanical ventilation, length of stay in the ICU, and the ICU survival.

Results

In group (1); the main reasons for ICU admission were hepatic coma (28%), respiratory failure (18%), postoperative care (18%), and other (36%).The ICU mortality rates was 54% , that increased into when mechanical ventilation was required. ICU length of stay (LOS) 4.56 ± 2.21, 5.33± 3.71 days in survivors and nonsurvivors, respectively. While in group (2); the main reasons for ICU admission were shock (26.7%), renal (20%) ,respiratory failure (16.7%), hepatic coma (16.7%), and other (19.3%).The ICU mortality rates was 26.7%. ICU length of stay (LOS) 12.04 ± 10.82, 9.62± 7.38 days in survivors and nonsurvivors, respectively. Discrimination was superior for APACHE III on 24hr (AROC = 0.95,0.83) . Calibration was better using APACHE III on 24hr, , showed good calibration as indicated by hosmer –lemoshow (chi 5.275,14.25 at df 7,8 , p: 0.626,0.075),in group (1)&(2) respectively.

Conclusion

The Acute Physiology and Chronic Health Evaluation (APACHE III) reported to have better discrimination ability than SOFA-based model at 24hour of admission and a better accuracy to predict ICU mortality in oncological and non oncological patients.

Keywords: intensive care unit; outcome; SOFA; APACHE III; mechanical ventilation; caner.