DOES PATIENT MORTALITY INCREASE WITH LOW ALBUMIN LEVELS IN SEPTIC SHOCK?

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ABSTRACT

Aims: Severe sepsis and septic shock have been increasingly threatening hospitalized patiens, particularly surgical and intensive care unit patients. Despite all struggles, septic shock mortality levels are no lower than 40-60 %. Although numerous meta-analyses have shown that albumin treatment in septic shock definitely increases mortality, a final shared view among clinicians is not available. In this study, the relationship between albumin levels and CRP and APACHE-II scores and its effect on mortality in septic shock patients have been studied.

Methods: Data belonging to 30 (17 males and 13 females) patients who are being followed up with the diagnosis of septic shock have been scanned retrospectively. The effect of albumin levels on mortality in septic shock patients have been studied.

Results: A significant relationship between a decrease in the albumin levels and elevated CRP and APACHE-II scores have been found. Albumin levels being above 2,5 mg/dl indicates patient survival with %90 sensitivity, as well as albumin levels being under 1,8 mg/dl indicates a patient mortality with %98 specificity.

Conclusion: Albumin, which would be applied in a planned way to septic shock patients, may contribute positively to mortality and morbidity.

Key Words: Intensive care unit, septic shock, albumin

INTRODUCTION

Intensive care units are the units which have a high mortality rate which changes between %16 and %67 depending on the severity of the cases (1). Prognosis of the patients, who are being followed up in the intensive care unit, is determined by lots of factors affected by previous diseases and course of events.

In order to evaluate the observed mortality rate in an objective way, it should be compared with the expected mortality rate and the severity of the disease should be known. The objective disease severity measurement scales which are gained from prognostic systems are useful in the comparison of clinical performances on hospital and international level and interpreting the gross mortality rate. The most widely known and used system in this matter is APACHE II (Acute physiology and chronic health evaluation) score.

In intensive care units there are lots of factors reported to be effective on mortality. The most frequently mentioned risk factors among these are having respiratory failure which requires mechanical ventilation (MV), arising complications (renal failure, sepsis etc.) and high APACHE II score (2,3). However it is being thought that these are not the only factors for the ICU patients which affect mortality.

Knowing these factors and determining the patients with the high risk are among the important subjects in intensive care units. In the studies it has been emphasized that the serum albumin is significantly high in the surviving patient group, however sensitivity and specificity is found to be low, and it has been realized that it has no has no effect on APACHE II over determining the result of the patient (6).

This study has been carried out retrospectively in Trakya University Faculty of Medicine Intensive Care Unit between January 2013 and February 2013. The aim is to provide the tissue perfusion in the patients with septic shock. The values of the patients such as age, sex, time spent in intensive care, APACHE II score, CRP and albumin levels have been scanned. Patients were not separated based on their diseases. Thus in the latest guides, albumin infusions are suggested. In this study the relation between albumin levels of patients in septic shock and patient mortality has been aimed.

MATERIAL AND METHODS

This study has been carried out by retrospectively examining the patient records belonging to patients who have been hospitalized in Trakya University Medical Faculty Hospital Intensive Care Unit. Data belonging to a total of 30 patients (17 males, 13 females) with severe infection (sepsis) have been scanned retrospectively. The criteria for the diagnosis of sepsis are the presence of known or suspected infection along with two or more SIRS (Systemic Inflammatory Response Syndrome) criteria. SIRS criteria are as follows: body temperature less than 36°C or greater than 38°C, heart rate greater than 90 beats per minute, respiratory rate greater than 20 breaths per minute, leukocytes less than 4000 cells/mL) or greater than 12,000 cells/mL or the presence of greater than 10% band form neutrophils. Data belonging to patients diagnosed with sepsis according to the criteria explained above has been examined in terms of age, gender, ICU hospitalization interval APACHE-II scores, CRP and albumin levels.

12 patients have died whereas 18 have been discharged after treatment had been completed. There has been no difference between the fluid diets of patients. Patients have received no albümin-containing fluids. Patients have not been classified according to their diseases. Patient data has been gathered in one common database and stratification has been made in relation to CRP and APACHE-II rates. Confidence interval (CI) has been taken as %95 and $p<0.05$ values are accepted as meaningful. The results are given as mean±SD.

RESULTS

The average ages of the patients are 61,9±17,6 years and the period of admittance is 7,2±5,2 days, albumin levels are 2,9±0,8 mg/dl (borderline), CRP values are 9,9±6,9, APACHE-II score is 21,9±7,0 (high, expected mortality rates are around %50). As a result, 18 of these patients have been discharged and 12 patients have deceased (%40 mortality). In the correlation analysis made increased CRP levels and APACHE-II score have a meaningful relation (p=0.001). In the ROC curve analysis, decrease in the albumin levels and patient mortality have been found to have a meaningful relation (AUC: 0.711, 0.580-0.840, CI:%95, p=0.015). Albumin levels being above 2,5 mg/dl indicates patient survivability with %90 sensitivity, as well as albumin levels being under 1,8 mg/dl indicates a patient mortality with %98 specificity. In the regression analysis every 0,1 mg/dl decrease under 2,5 mg/dl in albumin levels increases the mortality risk 10 times.
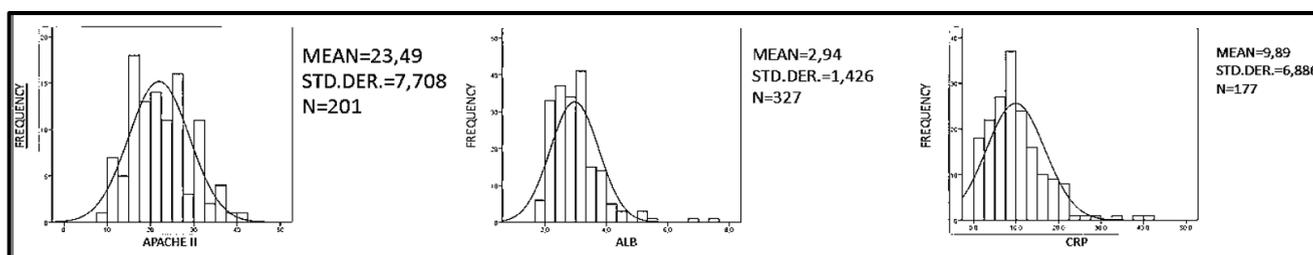
DISCUSSION

There are not enough randomized and prospective studies related to the fluid replacements applied to the patients routinely in intensive care unit (ICU) patients. It is hard to say that with the chosen fluid, the prognosis of the patient will change or not. However, there is a meta-analysis which researches the effects on survival with or without albumin, crystalloid or colloid solutions, critic and non-critic patients. In the meta-analysis of "Cochrane İnjuries" group 24 studies covering 1419 patients have been evaluated. It has been asserted that there is a %6 increase in the absolute mortality in the patient group who received fluids containing albumin than those who received crystalloids (7).

In the acute cases such as infection, major surgery and multiple trauma, low plasma albumin levels is a possible outcome due to a decrease in albumin synthesis, increase in the degradation, capillary escape and fluid replacements in huge volumes. In septic shock, the albumin loss caused by the extravasation escapes from plasma may increase 3 times (8-9).

In our study increased CRP levels and APACHE-II scores have been found meaningfully related with decrease of albumin. This shows that the albumin which would be applied in a planned way to septic shock patients, may contribute positively to mortality and morbidity.

Decreased albumin levels in the patients who are in septic shock is an important indicator to foresee the patient mortality Its contributions to patient survival other than its benefits on tissue perfusion should be further studied.

MEAN=23,49 STD.DER.=7,708 N=201

MEAN=2,94 STD.DER.=1,426 N=327

MEAN=9,89 STD.DER.=6,886 N=177

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