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RELATIONSHIP BETWEEN DAILY CALORIE SUPPORT AND OUTCOME OF THE PATIENTS WITH SEPSIS IN INTENSIVE CARE

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ABSTRACT

Aims: One of the routine treatments in the intensive care is diet. The importance of the diet in the intensive care unit is because malnutrition is very common in the intensive care patients. Even though the information at hand cannot be able to show the effect of diet on survival shorter than 1 week, diet has a great importance in relation to the prevention of the morbidity in the intensive care unit due to malnutrition. This study aims to inspect the relationship between time of hospitalization, patient mortality, albumin and protein levels of the patients on the intensive care unit diet.

Methods: In the study 50 of the patients who are staying at the intensive care with the diagnosis of sepsis during 2012 (33 males and 17 females) have been chosen as randomized and their data is studied retrospectively.

Results: The results show a significant relationship between low albumin and protein levels and long patient hospitalization process. Also the high rates of albumin levels are inversely proportional with the patient mortality are among the data gathered. Further studies will be leading the way for the better understanding of the importance of diets among intensive care patients.

Conclusion: Further studies will be more enlightening in terms of providing a better grasp on nutrition of intensive care unit patients.

*Key Words:* Intensive care unit, nutrition, albumin

INTRODUCTION

Malnutrition is commonly seen in the intensive care patients. Malnutrition developing under intensive care unit conditions causes immune system to be suppressed, inflammatory response to increase, organ functions to be impaired, wound healing to be delayed and clinical outcomes to deteriorate. Plank and Hill's study has shown the changes in body structure and metabolism in situations such as sepsis and trauma. This study has proven that there is a significant increase in energy requirement of patients especially in the five days following the injury and that stuctural protein levels drop whereas the acute phase proteins increase. This resulting catabolic situation causes the fat-free body mass to dramatically decrease (1). It is a significant aspect of intensive care unit patient treatment regimen to evaluate nutrition and if the patient nutrition is insufficient, to identify the metabolic stress factors causing it (2). Thus, diet is one of the routine treatments in the intensive care unit. Proper dieting should be applied in every intensive care unit. Researches are not able to show certainly the effect of applications shorter than one week on survival on the patients with a good diet. However diet carries an importance in preventing the morbi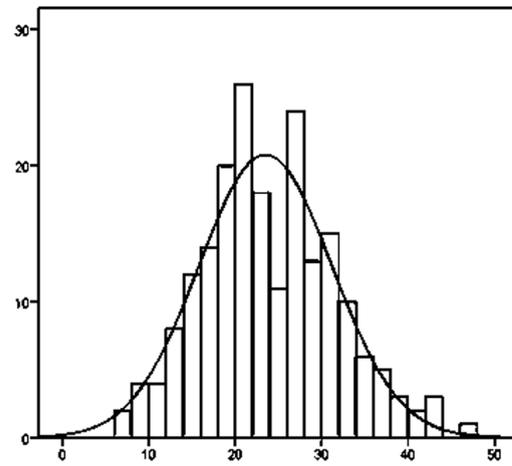dity aggravated by malnutrition. In some cases it is seen that the patients who have not been intubated and are fed orally are healthier. There are many criteria suggested and used to evaluate patients' nutrition conditions, non of which are proven to be definitely reliable. Among these criteria are body-mass index, subjective global evaluation, albumin, prealbumin and transferrin levels, anthropometric measurements and many other complex techniques (3-4). This study examines the relation between time of hospitalization and patient mortality and albumin and protein levels and meeting the energy requirements of the patients of intensive care with sepsis.
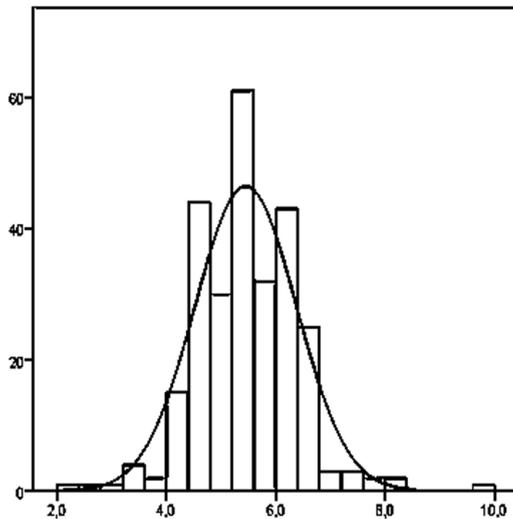
MATERIAL AND METHODS

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 50 patients (33 males, 17 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
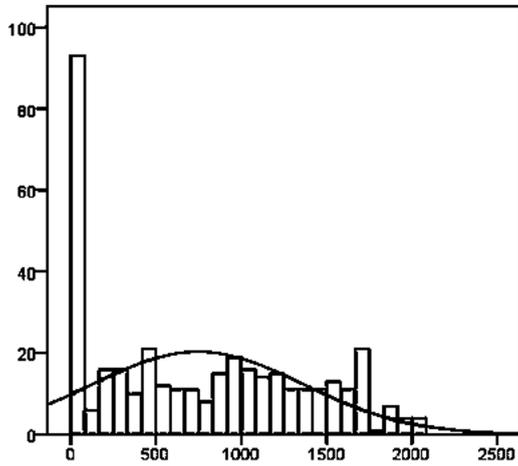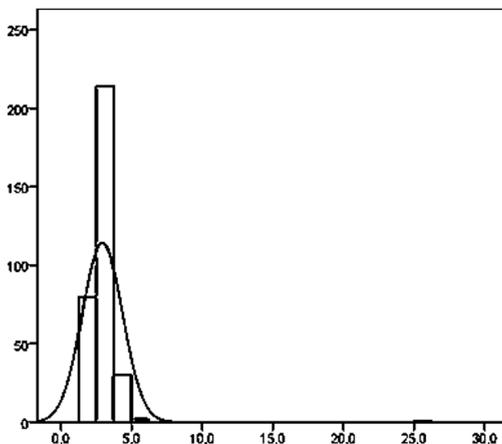
Graphic-1: Daily energy supplement for the patients.

Graphic-2: Patient protein levels.

Graphic-3: Patient albumin levels.

Graphic-4: Patient APACHE-II scores.

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.

Patient records including daily calorie intake of patients (kcal), protein level (g), albumin (mg/dl) and APACHE-II scores have been examined. Patient data has been gathered in one database and certified in relation to APACHE-II rates and a statistical analysis has been made. 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 64,4±16,7 years (early old age period), time of hospitalization is 7,6±3,9 days (short term limit), albumin levels are 2,9±1,4 mg/dl (borderline), protein levels are 5.5±0.9 mg/dl (low), daily supplied energy average is 745.8±617.6 kcal (low), APACHE-II score is 23.5±7.7 (high, expected mortality rates are around %60). As a result 25 of these patients have been discharged and 25 patients have deceased (%50 mortality, this is higher than the expected average in intensive care). In the correlation analysis made, it has been understood that old age may extend the admission period in the hospital ($p=0.06$), as well as there is a relation between low albumin and protein values and patient admission time length ($p=0.02$, $p=0.05$). In the ROC curve analysis made; the increase in the albumin levels (AUC: 0.631, 0.490-0.780, CI:%95, $p=0.05$), even though not in strong levels, has an adverse relationship between the patient mortality. Albumin levels lower than 2,5 – 2,2 – 1,8 consecutively increase patient mortality in a logarithmically (RR increase x 12).

DISCUSSION

The results of this study show that patient hospitalization period is 7,6±3,9 days. Albumin levels used to evaluate patient nutrition may be deceptive, because albumin, whose half life is 20 days, cannot be trusted to reflect acute changes. Furthermore, albumin levels seem to drop due to dilution which is caused by fluid retention, occuring almost all critical patients. Daily energy supplement is found to be 745.8±617.6 Kkal. Intensive care patients with sepsis cannot be supported with enough energy (kcal/day) contrary to what is believed, even though they have increased basic energy needs. These results suggest that the fact that the intensive care unit patients have a mortality level of 50% can be related to insufficient nutrition. As a relative indicator to that low albumin levels cause an increase in the mortality and morbidity of the patients.

Ethics Committee Approval: This study was approved by Trakya University Faculty of Medicine Scientific Researches Ethics Committee.
Informed Consent: Written informed consent was obtained from the participants of this study.
Conflict of Interest: The authors declared no conflict of interest.
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