



The Egyptian Society of Chest Diseases and Tuberculosis
Egyptian Journal of Chest Diseases and Tuberculosis

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ORIGINAL ARTICLE

Assessment of nutritional support in critically ill patients and its correlation with outcomes at respiratory intensive care unit at Zagazig University Hospitals in (2014–2015)

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Received 29 June 2016; accepted 11 July 2016

KEYWORDS

Enteral nutrition;
 Total parenteral nutrition;
 RICU;
 Nutritional assessment;
 Nutritional support

Abstract *Background:* Adequate nutritional support is essential for improving outcomes in hospitalized critically ill patients, who have high rates of malnutrition. Critical illness is typically associated with a catabolic stress state in which patients commonly demonstrate a systemic inflammatory response. This response is coupled with complications. So, malnutrition and inappropriate nutritional support lead to increased morbidity and mortality, decreased quality of life, prolonged duration of mechanical ventilation, and increased length of hospital stay. Critically ill patients require special attention to prevent muscle wasting and to avoid a lot of complications.

Aim of the study: To throw light on nutritional assessment in critically ill patients and the effect of providing appropriate nutritional support in respiratory ICU based on patients' clinical condition on their outcome.

Patients and methods: A non-randomized clinical trial was carried out at Respiratory Intensive Care Unit at Zagazig University Hospitals during the study period (2014–2015). This study was conducted on 96 patients who were admitted to RICU. They were categorized into 3 groups according to nutritional support. Group (1): 32 patients supported by enteral nutrition (EN). Group (2): 32 Patients with inadequate enteral nutrition and supported by complementary parenteral nutrition (Compl. PN) Group (3): 32 patients supported by total parenteral nutrition (TPN) as EN was contraindicated for them. All patients were subjected to full history taking, clinical examination, and nutritional assessment through dietary and fluid intake history, clinical assessment, biochemistry and anthropometry. The nutrition regimen was designed after assessing the patient requirements for energy, protein, fluid and electrolytes. Monitoring of patients was done by follow up of the anthropometry and laboratory parameters, finally, the outcome variables were compared between the 3 groups.

Results: Of the 3 studied groups, there were no differences in their daily caloric and protein requirements but the percentage of goal delivered was higher in Compl. PN and TPN groups than

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Peer review under responsibility of The Egyptian Society of Chest Diseases and Tuberculosis.

<http://dx.doi.org/10.1016/j.ejcdt.2016.07.002>

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in the EN group (100% vs 81.41% \pm 13.45%). EN group patients have better nitrogen balance than in the Compl. PN and TPN groups (p 0.02, $<$ 0.001 respectively) at follow up days. Pneumonia, sepsis and infections other than pneumonia were higher in the TPN group but vomiting and diarrhea were higher in the EN group and metabolic complications were higher in the TPN group as regards the duration of MV and the length of hospital stay both were higher in TPN group than in the other two groups, difficult and prolonged weaning were higher in the TPN group. Mortality was higher in the TPN group ($p < 0.01$).

Conclusion: Sufficient nutritional support whether enteral or parenteral is very important in critically ill patients. TPN should never be used as a substitute for EN in patients who can tolerate enteral feeding as it is associated with infectious and metabolic complications and its deleterious effect on patients' outcome.

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Introduction

Malnutrition is an alteration of body composition in which deficiencies of macronutrients and micronutrients result in reduced body cell mass, organ dysfunction, and abnormal serum chemistry values [1]. Malnutrition continues to be a wide spread problem in many inpatient settings, including intensive care units (ICUs). A number of studies have shown that the prevalence of malnutrition among hospitalized adults of all ages ranges from 20% to 69%, with a prevalence as high as 40% among critically ill patients. About 30% of hospitalized patients meet the criteria for malnutrition at admission [2]. In fact, patients with medical conditions that have been associated with malnutrition in the hospital setting, such as gastrointestinal disease, neuromuscular or arthritic impairment, hypoxic cardiopulmonary disease, cancer, and infection, are often undernourished at admission [3]. However, additional stress during hospitalization may exacerbate any pre-existing nutritional deficits in patients with these and other conditions. Critical illness, in particular, is associated with a marked increase in metabolism, leading to greater energy (i.e., caloric) requirements and loss of lean body mass [4]. So, nutritional support is a routine part of ICU therapy. It is recommended to treat and prevent malnutrition and nutrient deficiencies to improve patient outcomes, although adverse effects and complications of nutritional support may occur, so it is very important to select proper patient, timing and route of administration of nutrient and monitoring of the therapy [5]. So, the aim of the study was to throw light on nutritional assessment in critically ill patients and the effect of providing appropriate nutritional support in respiratory ICU based on patients, clinical condition on their outcome.

Patients and methods

Patients

This non randomized clinical trial study was conducted on 96 patients who admitted to RICU, Chest Department, Zagazig University Hospitals, in two years period from 2014 through 2015. Patients were categorized into 3 groups according to the type of nutritional support. Group (1): patients, who were supported by enteral nutrition, they were 18 males (56.2%) and 14 females (43.8%) with mean age of 55.78 \pm 9.94 years.

Group (2): patients with inadequate enteral nutrition (mean daily caloric delivery of $<$ 50–65% of the recommended value) and were supported by complementary parenteral nutrition, they were 17 males (53.1%) and 15 females (46.9%) with mean age of 55.94 \pm 10.13 years. Group (3): patients supported by total parenteral nutrition due to their contraindication to EN, they were 16 males (50%) and 16 females (50%) with mean age of 55.66 \pm 9.86 years.

Inclusion criteria

Adults who were admitted to the respiratory ICU with the following criteria:

- Respiratory ICU length of stay of $>$ 48 h.
- Patients who proved to be nutritionally at risk by Nutritional Risk Screening (NRS) score \geq 3.

NRS is a screening done by quick assessment of selected basic data to identify those who are nutritionally at risk and need nutritional support to maintain body functions and facilitate recovery [6].

- Patients who proved to be malnourished at admission by nutritional assessment through four assessment tools carefully interpreted in order to rapidly assess the nutritional status. (mentioned in details later):
 1. Dietary and fluid intake history.
 2. Clinical assessment.
 3. Biochemistry.
 4. Anthropometry.

Exclusion criteria

1. Age $<$ 18 years old.
2. Respiratory ICU stay of \leq 48 h.
3. Patients referred with nutritional regimen.
4. Pregnant or lactating females.
5. Did not give consent.

Methods

Patients were subjected to the following

1. Full history taking from the patient or his relatives.

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