Relationship of energy and protein adequacy with 60-day mortality in mechanically ventilated critically ill patients: a prospective observational study

ABSTRACT

Background & aims: The effect of provision of full feeding or permissive underfeeding on mortality in mechanically ventilated critically ill patients in the intensive care unit (ICU) is still controversial. This study investigated the relationship of energy and protein intakes with 60-day mortality, and the extent to which ICU length of stay and nutritional risk status influenced this relationship. Methods: This is a prospective observational study conducted among critically ill patients aged ≥18 years, intubated and mechanically ventilated within 48 h of ICU admission and stayed in the ICU for at least 72 h. Information on baseline characteristics and nutritional risk status (the modified Nutrition Risk in Critically ill [NUTRIC] score) was collected on day 1. Nutritional intake was recorded daily until death, discharge, or until the twelfth evaluable days. Mortality status was assessed on day 60 based on the patient's hospital record. Patients were divided into 3 groups a) received <2/3 of prescribed energy and protein (both <2/3), b) received ≥2/3 of prescribed energy and protein (both ≥2/3) and c) either energy or protein received were ≥2/3 of prescribed (either ≥2/3). The relationship between the three groups with 60-day mortality was examined by using logistic regression with adjustment for potential confounders. Sensitivity analysis was performed to examine the influence of ICU length of stay (≥7 days) and nutritional risk status. Results: Data were collected from 154 mechanically ventilated patients (age, 51.3 ± 15.7 years; body mass index, 26.5 ± 6.7 kg/m2; 54% male). The mean modified NUTRIC score was 5.7 ± 1.9, with 56% of the patients at high nutritional risk. The patients received 64.5 ± 21.6% of the amount of energy and 56.4 ± 20.6% of the amount of protein prescribed. Provision of energy and protein at ≥2/3 compared with <2/3 of the prescribed amounts was associated with a trend towards increased 60-day mortality (Adjusted odds ratio [Adj OR] 2.23; 95% confidence interval [CI], 0.92-5.38; p = 0.074). No difference in mortality status was found between energy and protein provision at either ≥2/3 compared with <2/3 of the prescribed amounts (Adj OR 1.61, 95% CI, 0.58-4.45; p = 0.357). Nutritional risk status, not ICU length of stay, influenced the relationship between nutritional adequacy and 60-day mortality. Conclusions: Energy and protein adequacy of ≥2/3 of the prescribed amounts were associated with a trend towards increased 60-day mortality among mechanically ventilated critically ill patients. However, neither energy nor protein adequacy alone at ≥ or <2/3 adequacy affect 60-day mortality. Increased mortality was associated with provision of energy and protein at ≥2/3 of the prescribed amounts, which only affected patients with low nutritional risk.

Keyword: Critical illness; Full feeding; Mortality; Nutrition risk; Permissive underfeeding