

Estimation of Energy Requirements for Mechanically Ventilated Critically Ill Patients Using Nutritional Status Indicators

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Background: The prevalence of malnutrition is a common problem in hospitalized patients, especially in critically ill patients who are being ventilated mechanically. Studies have shown that underfeeding and overfeeding may prolong the length of weaning from mechanical ventilation and hospital stay. The purpose of this study was to estimate energy requirements for mechanically ventilated, critically ill patients using nutritional status indicators.

Methods: Patients were dynamically stable, mechanically ventilated, critically ill patients and were requiring at least 8 days of mechanical ventilation. Seventy-eight patients successfully completed this study. Nutritional status was assessed according to patients' anthropometrical and biochemical measurements, daily nutrient intakes, nutritional status indices. Medical status was assessed on the 1st day and 8th day of admission in the intensive care unit. Resting energy expenditure was measured using indirect calorimetry. Total energy requirement was considered 120% of the measured resting energy expenditure. Thirty-three patients were being underfed (<90% of total energy requirement), 25 patients were in the appropriate feeding group (within $\pm 10\%$ of total energy requirement), and 20 patients received overfeeding (>110% of total energy requirement).

Results: Patients in the underfeeding group received only 59 % of their energy requirement, while the overfeeding group patients received up to 134 % of their required calories. Patients in all groups had a negative mean nitrogen balance. However, only patients in the appropriate feeding improved their nitrogen balance by day 8 of admission, and had a significantly improved in nutritional status index (Maastricht index) on day 8 than on day 1. (6.5 ± 2.9 vs. 5.2 ± 2.2)

Conclusion: Appropriate feeding group had improved significantly in nutritional status than patients in the other feeding groups on day 8. To provide 120% of the measured resting energy expenditure seemed adequate to meet the energy requirements of dynamically stable, mechanically ventilated, critically ill patients.

Keyword : underfeeding, appropriate feeding, overfeeding, critically ill patients, resting energy expenditure, nutritional status.