Early Achievement of Caloric and Protein Goals Predicts Improved Survival in Mechanically Ventilated ICU Patients

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Abstract:

Background: Early and adequate nutritional support is considered a cornerstone of critical care, yet many ICU patients fail to meet caloric and protein targets. This study aimed to investigate whether achieving 50% of caloric needs within the first three days of ICU admission is associated with improved survival.

Methods: A retrospective cohort study was conducted at Chi Mei Medical Center from November 2020 to January 2022. Adult ICU patients requiring endotracheal intubation and mechanical ventilation were included. Demographics, disease severity scores (APACHE II, SOFA, TISS), laboratory values, and nutritional indicators—including the timing of enteral nutrition initiation and the achievement of 50% caloric goals within 3 days—were collected and analyzed. Primary outcomes included survival during hospitalization, length of ICU stay, and mechanical ventilation duration.

Results: Among 187 patients analyzed, 110 survived and 77 died during hospitalization. Higher albumin and hemoglobin levels were associated with survival, while elevated BUN and lactate were linked to mortality. Patients achieving ≥50% of caloric goals within the first three days had significantly lower mortality (26.4%) compared to those who did not (73.8%) (OR = 2.7, 95% CI: 2.005–6.918, $p < 0.001$). While the average time to start feeding was slightly longer in the death group (40.2 ± 37.1 hours vs. 32.9 ± 30.2), the difference was not statistically significant. Survivors had shorter durations of mechanical ventilation and ICU stays, and higher rates of successful extubation within 72 hours.

Conclusion: Achieving at least 50% of caloric goals within the first three days is associated with improved survival in critically ill, mechanically ventilated ICU patients. These findings highlight the importance of timely and adequate nutritional interventions in improving patient outcomes in intensive care settings.

Keywords:

Early nutritional support, ICU survival, Enteral feeding, Caloric target, Critically ill patients, Mechanical ventilation.