

#ISICEM23: Low vs Standard Calorie and Protein Feeding



Critical illness requiring organ support is associated with high mortality and prolonged recovery. The acute phase is characterised by anorexia, metabolic disorders, endocrine dysfunction, and hypercatabolism with muscle wasting. Nutritional support is essential during this phase. Calorie and protein deficits have been linked to higher risks of healthcare-associated infections, ICU-acquired weakness, prolonged invasive mechanical ventilation, long ICU stays, and death. Critical care guidelines recommend starting nutritional support within 48 hours after ICU admission, with a target of 20-25 kcal/kg per day and 1.2-2 g/kg per day of protein during the acute phase. However, these targets are not always achievable due to gastroparesis, which causes intolerance to enteral nutrition, particularly in patients with severe critical illnesses.

Recent studies challenge the standard calorie and protein targets during the acute phase of critical illness recommended by international guidelines. In clinical trials, increasing enteral calorie intake did not improve outcomes, and adding parenteral nutrition to enteral nutrition was associated with longer ICU stays and higher infection rates. Higher protein intake during the acute phase might lead to greater muscle wasting and ICU-acquired weakness. In contrast, intentionally supplying fewer calories than recommended, even down to 400 kcal per day, did not adversely affect patient outcomes. However, no studies have compared low versus standard protein intakes during the acute phase, and the optimal calorie and protein intakes at this phase of severe critical illness remain unknown.

The NUTRIREA-3 study aimed to determine the optimal calorie and protein intake for severely critically ill patients in the acute phase. The researchers hypothesised that early calorie and protein restriction would lead to better outcomes than standard calorie and protein targets. This multicentre, randomised, controlled study was performed in 61 French ICUs. The study included patients receiving mechanical ventilation and vasopressor support for shock. Study patients were randomly assigned to receive early nutrition within 24 hours after intubation with either low or standard calorie and protein targets during the first seven days in the ICU. The primary endpoints were time to readiness for ICU discharge and day 90 all-cause mortality. The study also examined secondary outcomes such as secondary infections, gastrointestinal events, and liver dysfunction.

Out of 3044 patients enrolled in the study, eight withdrew from participation. By day 90, 41.3% of 1521 patients in the low-calorie group and 42.8% of 1515 patients in the standard group had died. The median time to readiness for ICU discharge was 8 days in the low-calorie group and 9 days in the standard group. The proportion of patients with secondary infections was similar in both groups. However, the low-calorie group had lower proportions of patients with vomiting, diarrhoea, bowel ischaemia, and liver dysfunction.

Findings from this study show that for nutritional support of patients in the acute phase of severe critical illness, calorie and protein restriction was superior to standard calorie and protein intake, with fewer complications and a faster recovery.

Source: [The Lancet](#)

Image Credit: ISICEM

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