

## LIVES2018: Does energy-dense nutrition improve outcomes?



The effect of delivering nutrition at different calorie levels during critical illness is uncertain, and patients typically receive less than the recommended amount. A new randomised trial demonstrates that in patients undergoing mechanical ventilation, increasing energy intake with the administration of energy-dense enteral nutrition did not affect survival. The results were presented at the European Society of Intensive Care Medicine congress, LIVES2018, in Paris.

"In this multicentre, double-blind, randomised trial, we compared energy-dense enteral nutrition with standard enteral nutrition in critically ill adults. The use of energy-dense nutrition increased energy intake to approximate full recommended goals but did not affect mortality or key secondary outcomes, including organ support and duration of hospital stay," according to The Augmented versus Routine Approach to Giving Energy Trial (TARGET) investigators.

The literature addressing the relationship between energy delivery and outcomes after critical illness is conflicting. Some studies report that increasing delivery improves outcomes, while others suggest that short-term energy delivery below recommended goals — either "permissive underfeeding" (approximately 1000 kcal per day) or "trophic feeding" (approximately 400 kcal per day) — is not associated with adverse effects. Accordingly, a definitive effect of energy delivery on outcomes has not been clear.

The TARGET study included adults undergoing mechanical ventilation in 46 Australian and New Zealand intensive care units (ICUs). Investigators evaluated energy-dense (1.5 kcal per millilitre) as compared with routine (1.0 kcal per millilitre) enteral nutrition at a dose of 1 ml per kilogram of ideal body weight per hour, commencing at or within 12 hours of the initiation of nutrition support and continuing for up to 28 days while the patient was in the ICU. The primary outcome was all-cause mortality within 90 days.

There were 3,957 patients included in the modified intention-to-treat analysis (1,971 in the 1.5-kcal group and 1,986 in the 1.0-kcal group). The volume of enteral nutrition delivered during the trial was similar in the two groups; however, patients in the 1.5-kcal group received a mean ( $\pm$ SD) of 1,863 $\pm$ 478 kcal per day as compared with 1,262 $\pm$ 313 kcal per day in the 1.0-kcal group (mean difference, 601 kcal per day; 95% confidence interval [CI], 576 to 626). By day 90, a total of 523 of 1,948 patients (26.8%) in the 1.5-kcal group and 505 of 1,966 patients (25.7%) in the 1.0-kcal group had died (relative risk, 1.05; 95% CI, 0.94 to 1.16;  $P = 0.41$ ).

The investigators observed similar results in seven predefined subgroups. Higher calorie delivery did not affect survival time, receipt of organ support, number of days alive and out of the ICU and hospital or free of organ support, or the incidence of infective complications or adverse events.

"It is important to note that no clinical evidence of overfeeding was observed, since mortality was similar in the two groups and carbon dioxide levels were not higher, weaning from mechanical ventilation did not take longer, and infectious complications were not more common in the 1.5-kcal group than in the 1.0-kcal group," the research team says.

It was not feasible to measure energy expenditure in this large, pragmatic trial, due to its blinded design. Thus, it remains uncertain whether matching delivery to measured expenditure is beneficial, according to the research team.

In addition, the majority of the patients in this trial were medical patients; therefore, a different response may be possible in surgical or trauma patients who receive increased calorie delivery, the researchers note.

Source: [The New England Journal of Medicine](#)

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