An evidence based algorithm for nutritional support accompanied by a multifaceted implementation strategy improved some outcomes in critically ill patients


In critically ill patients, does implementation of an evidence based algorithm for nutritional support improve the provision of nutritional support and patient outcomes?

**METHODS**

- **Design**: cluster randomised controlled trial.
- **Allocation**: (concealed)*.
- **Blinding**: (unblinded)*.
- **Follow up period**: until hospital discharge.
- **Setting**: intensive care units (ICUs) of 11 community and 3 teaching hospitals in Ontario, Canada.
- **Patients**: 499 patients aged ≥16 years (mean age 66 y, 61% men) with an expected ICU stay of ≥48 hours. Exclusion criteria: expected to be receiving sufficient oral nutrition within 24 hours after ICU admission, admitted for palliative care, moribund and not expected to survive ≥6 hours, or suspected brain death.
- **Intervention**: 7 intervention ICUs were allocated to an evidence-based algorithm for nutritional support, with a multifaceted implementation strategy including opinion leader led education sessions, educational outreach visits, and audit and feedback. The algorithm emphasised early nutrition, preference for the enteral route, frequent re-evaluation; and management of adverse outcomes. 7 ICUs were allocated to the control arm, which included care by a dietitian who had not been given specific guidance on provision of feedback.
- **Outcomes**: hospital mortality, length of hospital stay, length of ICU stay, and receipt of nutritional support.
- **Patient follow up**: 99% (intention to treat analysis).

*Information provided by author.

**MAIN RESULTS**

The intervention ICUs did not differ from control ICUs for hospital mortality rates (27% v 37%, p = 0.06). Patients in intervention ICUs had a shorter mean length of hospital stay than those in control ICUs (25 v 35 d, p = 0.003), but the groups did not differ for mean length of ICU stay (10.9 v 11.8 d, p = 0.7). Patients in intervention ICUs received more days of enteral nutrition than those in control ICUs (6.7 v 5.4/10 patient d, p = 0.04).

**CONCLUSION**

In critically ill patients, multifaceted implementation of an evidence-based algorithm for nutritional support improved provision of enteral nutrition and reduced length of hospital stay.

**Commentary**

The algorithm developed by Martin et al provides a clear path to early initiation of enteral nutrition. Early enteral nutrition has been shown to be beneficial for patients in the ICU who are seriously ill. The main findings of the study by Martin et al were a greater number of days of feeding in the intervention group, an important reduction in length of hospital stay, and, although not statistically significant, a 10% mortality reduction. There must be some indication that these effects (ie, reduced length of hospital stay and mortality) are actually the result of improvements in feeding practice (eg, protein and energy intake) that follow from effective implementation of an evidence based algorithm. Small, but non-significant, differences between groups were seen in feeding delay, protein and energy intake, and time from admission until 80% of the feeding target was achieved. However, it is difficult to explain how these small effects could result in such impressive outcomes. Early feeding has been shown to improve protein and energy intake but not mortality. A systematic review of early enteral feeding also found a reduction in length of hospital stay of 2.2 days (95% CI 0.81 to 3.6 d) but no significant difference in mortality.

Implementation of early feeding would clearly benefit patients in the ICU who are seriously ill, and an algorithm can assist nurses to improve nutritional support and efficiency of care by reducing practice variation. Although multifaceted implementation strategies may be considered too costly for many hospitals, the potential for wider societal benefit should outweigh such a narrow view.

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