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CORRESPONDENCE

Are we meeting nutritional targets for critically ill patients?

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To the Editor,

Critically ill patients benefit from early enteral nutrition (EN),[1] as it promotes gastrointestinal immunity and decreases nosocomial infections.[2,3] Nevertheless, cross-sectional studies show that up to 40% of patients in the intensive care unit (ICU) do not receive nutrition.[4] The objective of this report was to evaluate the time to nutritional adequacy, defined as the time to achieve at least 80% prescribed EN, and associated factors in our centre (Table).

One hundred consecutive patients admitted to the ICU for more than 48 hr were included in this retrospective cohort study, and patients with absolute contraindications to EN were excluded. We compared the time to nutritional adequacy of patients who received EN with those who received EN plus parenteral nutrition (PN), and we used Cox regression analysis to determine the factors that were significantly associated with achieving adequate nutrition.

Eighty percent of patients received some form of EN, and 58% received EN exclusively. Reasons for interruption of EN included awaiting confirmation of a feeding tube, gastrointestinal bleeding, awaiting procedures, potential extubation, and transition to an oral diet.

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The median time to initiate EN after admission was two days, and only 24% of patients received any EN within 24 hr of admission. While 7% of patients received PN exclusively, 13% received no nutrition. Patients receiving EN exclusively achieved nutritional adequacy faster than those who received combined EN and PN (4.6 *vs* 7.1 days, respectively; $P < 0.01$). Cox regression analysis showed that age and early use of prokinetics were significantly associated with achieving adequate nutrition (hazard ratio 1.04 and 3.68; $P = 0.03$ and 0.02, respectively). A sensitivity analysis using backward stepwise selection produced similar estimates.

This study provides a contemporary Canadian snapshot of ICU nutrition in a single institution, highlighting a discrepancy in some areas between clinical practice and published guidelines. Early use of prokinetics was significantly associated with achieving adequate nutrition.

New 2013 recommendations for critical care nutrition have just been released. Based on emerging studies, combined EN and PN is not recommended, and this approach was rare in our study. Parenteral nutrition is not recommended until all strategies to maximize EN delivery have been attempted (e.g., small bowel feeding tubes, prokinetics); however, in our study, these optimal practices for EN delivery were not always initiated prior to PN.

The role of combined EN and PN remains controversial. An observational study by Cahill *et al.*[5] suggested that combination EN and PN provided increased calories but resulted in no difference in hospital length of stay or mortality.[5] Observational studies suggest early PN is beneficial, but clinical guidelines are inconsistent. European societies promote PN within two days of admission, while North American guidelines suggest later PN initiation.

Table Demographic characteristics of patients receiving enteral nutrition

Variables ($n = 80$) Type of Nutrition:	Descriptive statistics *n* (%)
EN exclusively	58 (72.5%)
EN and PN	22 (27.5%)
Enteral nutrition on day 1:	
Jevity® 1.2 or 1.5	9 (11.3%)
RESOURCE® 2.0	2 (2.5%)
Nepro®	7 (8.8%)
Isosource® VHN	1 (1.3%)
Other	5 (6.3%)
None	56 (70.0%)
Patients on EN on Day 1:	19 (23.8%)
Location of distal tip of feeding tube:	
Proximal	9 (11.3%)
Medial	35 (43.8%)
Distal	31 (38.8%)
Not present	4 (5.0%)
Unknown	1 (1.3%)
First time receiving prokinetic:	
Day 1-2	12 (15.0%)
Day 3-4	11 (13.8%)
Day 5-10	5 (6.3%)
Day > 10	3 (3.8%)
Not used	49 (61.3%)
Days to target (80% prescribed EN Nutrition):	Mean (SD)
EN exclusively group ($n = 58$)	4.1 (2.0)
EN & PN group ($n = 22$)	7.6 (3.8)
Time to initiation of EN (in days):	Median [IQR]
From admission to first day of prescription:	2.0 [1.8]

EN = enteral nutrition; IQR = interquartile range; PN = parenteral nutrition; SD = standard deviation. Jevity® (altavista, VA, USA); RESOURCE: eau Claire, WI, USA; Nepro®: altavista, VA, USA; Isosource® VHN: eau Claire, WI, USA

Limitations of our study include the small sample size, reflected by wide confidence intervals. The retrospective design precluded consistent abstraction of reasons why EN was held (e.g., extubation, delayed gastric emptying, tracheostomy, etc.) or indications for PN. Twenty patients who received PN or no nutrition were excluded from the analysis. Since the study was conducted in one centre, findings may not be widely generalizable. Strengths of this study include consecutive enrolment, detailed data abstraction, real-world examination of nutrition practices, and rigorous regression analysis. Although early use of prokinetics was not common, our findings are consistent with studies that show an association between early use of prokinetics and achieving EN targets.

We suggest that it would be informative to conduct local research to identify barriers to initiating nutrition within the first 24-48 hr of admission to the ICU. Developing active customized strategies for changes in behaviour would also aid knowledge translation in this field. Encouraging implementation of proven nutritional strategies that are detailed in established guidelines should result in improved outcomes for critically ill patients.

Conflicts of interest None declared.

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