

Commentary

Intensive care unit nutrition – nonsense or neglect?

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See related research article by Binnekade *et al.* in this issue [<http://ccforum.com/content/9/3/R218>]

Abstract

Systematic undernutrition of intensive care unit patients is common and neglected. Is this inevitable or can better routines and protocols make a difference? The necessity of feeding may be regarded as self-evident, but more evidence is obviously needed to strengthen this issue. In rich countries it should be a human right not to be hungry.

Intensive care unit (ICU) nutrition is a field of controversy. Does it do good or harm to patients? Does it have any bearing on outcome in the ICU or during the post-ICU period?

Although not evidence based in any prospective, controlled, randomized clinical trials, it is unlikely that anyone would dispute that under-feeding eventually leads to death. This parallels the lack of controlled studies on the use of parachutes when jumping out of aeroplanes at high altitude. Nevertheless, a short period of starvation appears to be a part of clinical treatment in many ICUs. This is highlighted by a report from colleagues in The Netherlands presented in this issue of *Critical Care* [1].

Intensive care medicine is a comparatively young speciality, and within our arsenal of treatments the amount of evidence-based knowledge is often embarrassingly low. An illustration of this is seen in the guidelines for the Surviving Sepsis Campaign, in which the evidence for different treatment modalities was evaluated in a formalized way [2]. When we come to ICU nutrition, there is little evidence at hand in terms of prospective, randomized, controlled clinical trials; this was highlighted in recently published Canadian guidelines [3].

The most inflamed and still unsettled controversy pertains to parenteral nutrition. Some authors even call it 'poisonous nutrition' and ban it from use in the ICU [4]. Most investigators and authorities in the field would advocate enteral nutrition before parenteral, merely on the grounds that

it is the natural way to feed and is cheaper [2]. The evidence in favour of enteral over parenteral nutrition, or the other way around, is weak; furthermore, it is obsolete because it was generated more than 10 years ago, with obscure indications for parenteral nutrition and with no blood sugar control. In studies comparing enteral and parenteral nutrition in patients whose attending physician is unsure regarding which modality will be optimal, the results demonstrate a very low feeding success rate with enteral nutrition and that complications are related to the duration of nutritional treatment, regardless of the mode of administration [5].

In general terms it has repeatedly been shown that when patients are given only enteral nutrition, the success of feeding is below 70%. Successful feeding may be defined in terms of the percentage of prescribed calories, number of days with at least 80% of prescribed calories delivered, or any other measure. The study from The Netherlands presented in this issue adds further evidence to a number of publications that demonstrate that clinical practice is equivalent to delivering as little as 50% of the prescribed kilocalories. Does this make any difference?

Probably, a very large study population would be required to demonstrate that patients do worse when they are administered only 50% of the prescribed dose of antibiotics. The safety margin for bacterial kill when administering antibiotics is such that reducing doses to half would require 5000–10,000 patients to show a difference in a prospective study. Still no-one would advocate such a regimen. However, the side effects of antibiotics create renal insufficiency, liver insufficiency and drug fever, and predispose to development of multi-resistant bacteria. Nevertheless, no-one would deliberately give only 50% of the prescribed dose, stating that it does not matter whether 50% or 100% of the dose is administered. When it comes to nutrition, however, many of us do this.

In the study presented in this issue [1], the *post hoc* analysis shows that any action that reflects an interest in nutrition, such as placing the tube in any other position than the stomach, using some type of enhanced formula, or having a percutaneous feeding device, increases success rates with nutrition. These specially treated patient groups were small, and findings in these groups should perhaps not be used as a basis for clinical recommendations, but it is clear that an enhanced interest in nutrition and delivery of nutrition will increase success rates. So, the main reason for the systematic under-feeding that is practiced in ICUs is probably a lack of interest by the attending physician.

Binnekade and coworkers [1] do not give any information on success rates of feeding in relation to outcome. This is a difficult area, and studies that try to link nutritional practice to outcome must be designed carefully. There are examples in the literature of investigators jumping to conclusions based on insufficient information. Nevertheless, in any patient in whom a huge energy deficit is built up, resulting in malnutrition, increased risk for complications can be predicted. New prospective studies in this area are desperately needed. In addition, evaluation of nutritional protocols in terms of success rate, nutrition related complications and outcome must be encouraged. Systematic under-feeding of ICU patients may be used as a marker of suboptimal care. Wherever it is considered a human right not to be hungry, the burden of producing proper evidence should be imposed on anyone who suggests that half the feed is good enough.

Competing interests

The author(s) declare that they have no competing interests.

References

1. Binnekade JM, Tepaske R, Bruynzeel P, Mathus-Vliegen EMH: **Daily enteral feeding practice on the ICU: attainment of goals and interfering factors.** *Crit Care* 2005, **9**:R218-R225.
2. Dellinger RP, Carlet JM, Masur H, Gerlach H, Calandra T, Cohen J, Gea-Banacloche J, Keh D, Marshall JC, Parker MM, *et al.*: **Surviving Sepsis Campaign guidelines for management of severe sepsis and septic shock.** *Intensive Care Med* 2004, **30**: 536-555.
3. Heyland DK, Dhaliwal R, Drover JW, Gramlich L, Dodek P; the Canadian Critical Care Clinical Practice Guidelines Committee. **Canadian clinical practice guidelines for nutrition support in mechanically ventilated, critically ill adult patients.** *JPEN J Parenter Enteral Nutr* 2003, **27**:355-373.
4. Marik PE, Pinsky M: **Death by parenteral nutrition.** *Intensive Care Med* 2003, **29**:867-869.
5. Woodcock NP, Zeigler D, Palmer MD, Buckley P, Mitchell CJ, MacFie J: **Enteral versus parenteral nutrition: a pragmatic study.** *Nutrition* 2001, **17**:1-12.