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Successful Enteral Nutrition in Critically Ill Patient with a Strict Protocol

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Introduction

During the last two decades, nutritional support has been recognised as a vital component in the management of critically ill patients. Nutrition supplies vital cells substrates, antioxidants, vitamins and minerals that optimise recovery from illness (Heyland 1998). Critically ill patients are in constant hypercatabolism. Even if patients had a good nutritional status before they entered the ICU, they are at risk of developing malnutrition (Monk 1996). Protein energy malnutrition is a major problem in severely ill hypercatabolic patients in the ICU (Jolliet et al. 1998). Critical illnesses, stress, and surgery place increased demands on the body's nutritional requirements. These conditions promote a catabolic state and negative nitrogen balance. Prolonged bed rest and inactivity, per se, produce a negative nitrogen balance in healthy individuals (Scheld et al. 2001).

Malnutrition is a common problem in hospitalised patients. As many as 40% of adult patients are seriously malnourished at the time of their admission, and two thirds of all patients experienced deterioration of their nutritional status during their hospital stay (Cera et al. 1997). Numerous tools and scoring methods are used to screen for malnutrition in the community and hospitals (Jones 2002). Most of these tools are either not validated clinically, or are not user-friendly enough for busy clinics. Body mass index (BMI) is a simple and objective measurement for determining the nutritional status and is an important component of several malnutrition screening tools (Kondrup et al. 2003). Patients with BMI less than 18.5 Kg/m2 are classified as severely malnourished by these tools. Subjective global assessment (SGA) scores, determined by medical history on seven items and clinical findings on four items, is a well-validated tool for screening for malnutrition (Detsky et al. 1987).

Nutritional Support Routes

The optimal route of nutrition support has been studied extensively. The evidence shows that, in critically ill patients with an intact GI tract, the use of enteral nutrition compared with parenteral nutrition is associated with a significant reduction in infections (Gramich et al. 2004). The use of parenteral nutrition was associated with an increase in infectious complications, catheter related bloodstream infections, and noninfective complications (Peter et al. 2005). A significant reduction in hospital length of stay (LOS) was also seen with the use of enteral nutrition in these patients.

According to the Canadian Clinical Practice Guidelines for nutrition support, when considering nutritional support in critically ill patients with an intact GI tract, enteral nutrition is strongly recommended over parenteral nutrition. Enteral Nutrition has been advocated as a means of reducing mucosal atrophy and increased intestinal permeability with consequent reduction in the incidence of gut translocation and septic complications. More qualities can be attributed to enteral nutrition: It is cheaper, more physiological and safer overall in this patient group (Heyland et al. 2003).

Enteral nutrition has been demonstrated to:
• Improve nitrogen balance;
• Increase wound healing,;
• Improve host immune function;
• Increase cellular antioxidant system;
• Decrease hypermetabolic response to tissue injury;
• Preserve intestinal mucosal integrity immunity;
• Prevent increased bacterial translocation, (Minard and Hudsk 1994) and additionally; and
• Early feeding decrease infections complications and length of stay (Marik and Zaloga 2001).

The Canadian Nutrition Support Clinical Practice Guidelines recommend early enteral nutrition (within 24-48 hrs following admission) in critically ill patients (Heyland et al. 2003).

In the ICU at Hospital San José we start nutrition as soon as possible. On average, patients begin receiving nutrition 13.2 hrs after admission. It is well known that critically ill patients have frequent interruptions in feeding administration for various reasons and that why those patients do not reach their nutritional goals (Elpern et al. 2004). However, delivery of nutrition by the enteral route may be subject to a variety of barriers, more than the parenteral route.

These barriers include:
• Haemodynamic instability;
• Gut dysfunction;
• Gastric Retention;
• Ileus;
• Surgery;
• Tube feeding location;
• Many procedures and diagnostic tests in ICU;
• Radiological exams;
• Laboratory exams;
• Pharmacology gastroparesis; and
• The necessity to stop enteral infusion for patient mobilisation (McClave et al. 1999).

Importance of Utilising Strict Protocol

Nutrition is often prescribed by the physician and frequently, physicians fail to notice or realise that the prescribed amount of nutrition has not been administered, or if the patient has some intolerances. The success of enteral tube feeding depends on if the institution has a nutritional management protocol. Marked improvements in nutritional delivery can be achieved by implementing simple rules; such as efficient early placement of enteral tubes when patients arrive in the ICU, delivery of enteral nutrition as soon as possible, and limiting interruptions in feeding administration (Binnekade et al. 2005).

We are completely agreement with the Canadian guidelines on nutritional support. However, we think that based in our experiences, the use of semi-elemental formulas, improve the nutritional requirements earlier than polymeric formulas.

Glutamine

A number of trials utilising glutamine in critical illness have revealed that glutamine could improve infectious morbidity and mortality in critically ill patients (Goeters et al. 2002; Ziegler et al. 1992). Glutamine is now known to be "conditionally essential" in states of serious illness or injury (Lacey and Willmore 1990). A hypothesis for these improvements is that the release of glutamine after stress provides a vital fuel source for enterocytes of the small bowel, rapidly dividing leukocytes and macrophages in the immune system, for its essential role in nucleic acid synthesis, and for acid-base homeostasis in the kidney (Uehara et al. 2005; Morrison et al. 2006; Wischmeyer 2007).

Conclusion

Based on research gathered from several papers, when treating critically ill patients with an intact GI tract, we prefer enteral over parenteral nutrition, and stress the importance of early, efficient and continuous delivery. Based on our experience, we think the use of semi-elemental formulas via enteral route let us target earliest nutritional requirements in critically ill patients.

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