

Specific nutritional supplements reduce infection rate and length of hospital stay

Nyon, 17th March 2004 – Recent data presented at the 6th World Congress on Trauma, Shock, Inflammation and Sepsis, held in Munich 2-6 March 2004, demonstrated that specialized nutritional supplements have a key role to play in modulating disease and improving outcome in patients undergoing elective surgery.

Dr Daren Heyland, Associate Professor, Kingston General Hospital, Ontario, Canada, presented data from an updated meta-analysis showing how these products can reduce infectious complications following elective surgery and cut hospital length of stay. This data previously suggested differential treatment effects in surgical patients from those seen in critically ill patients¹ but this is the first time the updated data was presented.

Study results

“The most current aggregated analysis of arginine-containing supplements in elective surgical patient populations shows a huge treatment effect – a risk ratio of 0.53 and a P value of 0.001 indicating a highly statistically significant and a clinically important reduction in infectious complications – that is seen consistently across all studies. This clearly translates into a reduction in hospital length of stay of 2-3 days that again achieves statistical significance”, said Dr Heyland.

Clinicians are often skeptical about claims regarding length of hospital stay, which depend on practice patterns and often cannot be translated into other settings. But Dr Heyland said: “This is now seen in 17 studies, which consistently demonstrate a reduction in hospital stay with these supplements. This is a real finding that will have applications in other settings. With the growing trend towards fast-track surgery, he said it was important to identify patients at risk of surgical stress as they were the most likely to suffer postoperative complications.”

Benefits of using arginine-containing nutritional supplements

Dr Heyland noted that most of the studies had been conducted in patients with cancer, especially upper gastrointestinal cancer or major abdominal surgery. Furthermore, “15 of the 17 randomized controlled trials used *Impact*. To the extent that this product differs from other available arginine-containing products we can make a stronger inference for the use of *Impact* than we can other products.”

Arginine is an important amino acid that is metabolized by two different biochemical pathways: the arginase-1 pathway results in laying down connective tissue and improving wound healing, which is clearly beneficial in postoperative patients. The other pathway results in production of nitrogenous compounds, notably nitric oxide, which some investigators have hypothesized may worsen pre-existing multi-organ failure, sepsis and septic shock and therefore requires further understanding.

Dr Heyland said evidence suggested that elective surgical patients had increased arginase-1 expression, which leads to arginine-depletion in the postoperative setting and a deficiency

in cellular immune function. “With this immuno-incompetence these patients are at high risk for developing infectious complications, which might be modulated by providing an arginine-containing supplement.”

Fast track elective surgery

The concept of fast-track elective surgery has been gaining interest in recent years. It involves a program of managed perioperative care that aims to reduce the stress response in the patient through:

- preoperative education of the patient
- preoperative optimization of the patient’s physiological state
- use of less invasive operative techniques
- pain control based on epidural anesthesia and avoidance of opioids
- early postoperative feeding and mobilization.

One of the principle pioneers of this multimodal approach, Professor Henrik Kehlet from Hvidovre University Hospital, Denmark, has shown it to be associated with a reduction in need for hospitalization and medical morbidity, with shortened convalescence and reduced costs². “This shorter length of stay follows because patients have less stress, less morbidity and are able to go home earlier,” said Professor Kehlet.

Nutritional supplements and fast track surgery

Under these programs, elective surgery patients are no longer starved prior to surgery, as preoperative malnutrition is known to be a marker of poor surgical outcome. Dr Heyland noted that one recent trial had examined the role of arginine-containing supplements in the preoperative setting as a strategy for modulating the inflammatory response to surgery³. This was a large scale trial in which well-nourished patients were randomized to:

1. Preoperative *Impact* for 5 days with no nutritional support after surgery
2. Preoperative *Impact* for 5 days continued postoperatively
3. No artificial nutrition before or after surgery.

Although there was no difference in infectious complications between the two groups that received preoperative and perioperative *Impact*, these groups had significantly fewer infectious complications than the group that received no artificial nutrition.

Since these were well-nourished patients, Dr Heyland suggested that specific nutrients, rather than calories alone, were modulating disease and improving outcome. “I think that the concept of using nutrients in the preoperative setting to optimize your patient in the context of fast-track surgery is a very compelling one that is worthy of further exploration,” he said.

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References

1. Heyland DK, Novak F, Drover JW, et al. Should immunonutrition become routine in critically ill patients? A systematic review of the evidence. *JAMA* 2001;286: 944-53.
2. Kehlet H, Wilmore DW. Multimodal strategies to improve surgical outcome. *Am J Surg* 2002;183:630-41.
3. Gianotti L, Braga M, Nespoli L, et al. A randomized controlled trial of preoperative oral supplementation with a specialized diet in patients with gastrointestinal cancer. *Gastroenterology* 2002; 122: 1763-70.

Notes to editors

The 6th World Congress on Trauma, Shock, Inflammation and Sepsis was held in Munich from 2-6 March 2004. For more information please consult www.trauma-shock-sepsis-congress-munich-2004.org