

TOP Journal Club

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Preoperative Immunonutrition Suppresses Perioperative Inflammatory Response in Patients with Major Abdominal Surgery-A Randomized Controlled Pilot Study.

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BACKGROUND/AIM: Perioperative administration of immunoenriched diets attenuates the perioperative inflammatory response and reduces postoperative infection complications. However, many questions still remain unresolved in this area, such as the length of diet administration, diet composition, and the mechanisms involved. We performed an open, randomized, triple-arm study comparing the effect of two perioperative feeding regimens with a postoperative one. **METHODS:** 46 candidates for major elective surgery for malignancy in the upper gastrointestinal tract were randomized to drink preoperatively either 1 L of an immunoenriched formula (Impact) for 5 days (IEF group) or 1 L of Impact plus (Impact enriched with glycine) for 2 days (IEF plus group). The same product as the patient received preoperatively was given to both groups for 7 days postoperatively. In the control group (CON group), patients only received Impact for 7 days postoperatively; there was no preoperative treatment. The main outcome measures were postoperative C-reactive protein (CRP) serum levels. **RESULTS:** In the two preoperatively supplemented groups (treatment groups), perioperative endotoxin levels, CRP (postoperative day 7), and TNF-alpha (postoperative days 1 and 3) levels were significantly lower compared to the CON group ($p < .01$). Furthermore, the length of postoperative IMU/ICU stay (Impact 1.9 +/- 1.3 days; Impact plus 2.2 +/- 1.1 days; control group 5.9 +/- 0.8 days) and length of hospital stay (Impact 19.7 +/- 2.3 days; Impact plus 20.1 +/- 1.3 days; control group 29.1 +/- 3.6 days) were both reduced in the treatment groups compared to the control group. Infectious complications (Impact 2/14 (14%); Impact plus 5/17 (29%); control group 10/15 (67%)) also showed a trend toward reduction in the treatment groups. **CONCLUSIONS:** Perioperative administration of an immunoenriched diet significantly reduces systemic perioperative inflammation and postoperative complications in patients undergoing major abdominal cancer surgery, when compared with postoperative diet administration alone. A shortened preoperative feeding regimen of 2 days with Impact enriched with glycine (Impact plus) was as effective as Impact administered for 5 days preoperatively.

PROUD: Effects of preoperative long-term immunonutrition in patients listed for liver transplantation.

Trials. 2007 Aug 27;8(1):20

ABSTRACT: BACKGROUND: Patients with end stage liver disease are characteristically malnourished which is associated with poor outcome. Formulas enriched with arginine, omega-3 fatty acids, and nucleotides, "immunonutrients", potentially improve their nutritional status. This study is designed to evaluate the clinical outcome of long-term "immunonutrition" of patients with end-stage liver disease while on the waiting list for liver transplantation. **Methods/design.** A randomized controlled double blind multi-center clinical trial with two parallel groups comprising a total of 142 newly registered patients for primary liver transplantation is designed to assess the safety and efficacy of the long-term administration of ORAL IMPACT, an "immunonutrient" formula, while waiting for a graft. Patients will be enrolled the day of registration on the waiting list for liver transplantation. Study ends on the day of transplantation. Primary endpoints include improved patients' nutritional, anthropometrical, and physiological status, as well as patients' health related quality of life. Furthermore, patients will be followed for 12 postoperative weeks to evaluate anabolic recovery after transplantation as assessed by post-transplant mechanical ventilation, hospital stay, wound healing, infectious morbidities (pneumonia, intraabdominal abscess, sepsis, line sepsis, wound infection, and urinary tract infection), acute and chronic rejection, and mortality. **DISCUSSION:** Formulas enriched with arginine, omega-3 fatty acids, and nucleotides have been proven to be beneficial in reducing postoperative infectious complications and length of hospital stay among the patients undergoing elective gastrointestinal surgery.

Possible mechanisms include downregulation of the inflammatory responses to surgery and immune modulation rather than a sole nutritional effect. Trial registration: ClinicalTrials.gov NCT00495859.

Role of meal carbohydrate content for the imbalance of plasma amino acids in patients with liver cirrhosis.

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BACKGROUND AND AIM: Imbalance of circulating branched chain amino acids (BCAA) versus aromatic amino acids (AAA) and hyperinsulinemia are common metabolic alterations in patients with liver cirrhosis. The aim of this study was to characterize the effect of the carbohydrate component of a protein-rich mixed meal on postprandial plasma concentrations of 21 amino acids, insulin and C-peptide in patients with compensated liver cirrhosis. Furthermore, the effect of a dietary intervention on the metabolic alterations in cirrhotic patients was examined. **METHODS:** Eighteen patients with cirrhosis and 12 healthy volunteers received a protein-rich meal (pork filet 200 g) with or without carbohydrates (bread 50 g, glucose 20 g). A subgroup of four cirrhotic patients received an isoenergetic (117 kJ/kg bw) carbohydrate-enriched (60%) and -restricted (20%) diet for 7 days each. **RESULTS:** In the cirrhotic patients, basal plasma insulin and C-peptide concentrations were significantly elevated. The ingestion of a protein-rich meal without additional carbohydrates led to a significantly greater increase of insulin and C-peptide in the cirrhotic patients compared to controls. Postprandial increases of leucine and isoleucine were reduced, whereas those of phenylalanine were higher in cirrhotic patients. The addition of carbohydrates led to higher insulin and C-peptide plasma concentrations in cirrhotic patients. Postprandial BCAA increases were more impaired in the cirrhotic group after additional carbohydrate ingestion (46% vs 82%). After the carbohydrate-restricted diet for 7 days BCAA plasma levels increased but the BCAA/AAA ratio remained unaltered. **CONCLUSIONS:** The carbohydrate content of a meal enhances reduction of BCAA plasma concentrations in clinically stable cirrhotic patients. An imbalanced BCAA/AAA ratio cannot be avoided by a carbohydrate-reduced diet alone, supporting mandatory BCAA supplementation.

Parenteral nutrition and protein sparing after surgery: do we need glucose?

Metabolism. 2007 Aug;56(8):1044-50

Although capable of inducing an anabolic state after surgery, parenteral nutrition, including glucose, leads to hyperglycemia. Even moderate increases in blood glucose are associated with poor surgical outcome. We examined the hypothesis that amino acids, in the absence of glucose supply, spare protein while preventing hyperglycemia. In this prospective study, 14 patients with colonic cancer were randomly assigned to undergo a 6-hour stable isotope infusion study (3 hours of fasting followed by 3-hour infusions of amino acids, Travasol [Baxter, Montreal, Canada] 10% at 0.02 mL.kg⁻¹.min⁻¹), with or without glucose at 4 mg.kg⁻¹.min⁻¹) on the second day after colorectal surgery. Protein breakdown, protein oxidation, protein balance, and glucose production were assessed by stable isotope tracer kinetics using I-[1-(13)C]leucine and [6,6-(2)H2]glucose. Circulating concentrations of glucose, cortisol, insulin, and glucagon were determined. The administration of amino acids increased protein balance from -16±4 micromol.kg⁻¹.h⁻¹ in the fasted state to 16±3 micromol.kg⁻¹.h⁻¹. Combined infusion of amino acids and glucose increased protein balance from -17±7 to 7±5 micromol.kg⁻¹.h⁻¹. The increase in protein balance during nutrition was comparable in the 2 groups (P=.07). Combined administration of amino acids and glucose decreased endogenous glucose production (P=.001) and stimulated insulin secretion (P=.001) to a greater extent than the administration of amino acids alone. Hyperglycemia (blood glucose, 10.1±1.9 micromol/L) occurred only in the presence of glucose infusion. In summary, excluding glucose from a short-term feeding protocol does not diminish the protein-sparing effect of amino acids and avoids hyperglycemia.

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