

TOP Nutrition Newsletter

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The risk for bloodstream infections is associated with increased parenteral caloric intake in patients receiving parenteral nutrition.

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ABSTRACT: BACKGROUND: Patients receiving total parenteral nutrition (TPN) are at high risk for bloodstream infections (BSI). The notion that intravenous calories and glucose lead to hyperglycemia, which in turn contributes to BSI risk, is widely held but is unproven. We therefore sought to determine the role that hyperglycemia and parenteral calories play in the development of BSI in hospitalized patients receiving TPN. **METHODS:** Two hundred consecutive patients initiated on TPN between June 2004 and August 2005 were prospectively studied. Information was collected on patient age, sex, admission diagnosis, baseline laboratory values, intensive care unit (ICU) status and indication for TPN. Patients in the ICU were managed with strict glycemic control, whereas control on the general ward was more liberal. The maximum blood glucose level over each 8-hour period was recorded, as were parenteral daily intake, enteral daily intake and total daily caloric intake. The primary outcome measure was the incidence of BSI. Additional endpoints were ICU length of stay, hospital length of stay and mortality. **RESULTS:** A total of 78 patients (39%) developed at least one BSI, which were more common in ICU patients than in other hospitalized patients (60/122 patients versus 18/78 patients; $P < 0.001$). Maximum daily blood glucose concentrations were similar in patients with BSI and in patients without BSI (197 mg/dl versus 196 mg/dl, respectively). Patients with BSI received more calories parenterally than patients without BSI (36 kcal/kg/day versus 31 kcal/kg/day, $P = 0.003$). Increased maximum parenteral calories, increased average parenteral calories, and treatment in the ICU were strong risk factors for developing BSI. There was no difference in mortality between patients with and without BSI. **CONCLUSION:** Increased parenteral caloric intake is an independent risk factor for BSI in patients receiving TPN. This association appears unrelated to hyperglycemia. Based upon our observations, we suggest that parenteral caloric intake be prescribed and adjusted judiciously with care taken to account for all intravenous caloric sources and to avoid even short periods of increased intake.

Depletion of plasma antioxidants in surgical intensive care unit patients requiring parenteral feeding: effects of parenteral nutrition with or without alanyl-glutamine dipeptide supplementation.

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OBJECTIVES: Antioxidant depletion is common in critically ill patients. This study was designed to determine the effects of parenteral nutrition (PN), with or without glutamine (Gln) supplementation, on systemic antioxidant status in adult patients after major surgery who required PN in the surgical intensive care unit (SICU) setting. **METHODS:** Fifty-nine patients in the SICU who required PN after pancreatic surgery or cardiac, vascular, or colonic (non-pancreatic) surgery were randomized in a double-blinded study to receive standard PN (Gln-free) or Gln-supplemented PN (Gln-PN) in which Gln was provided as alanyl-Gln dipeptide. Conventional PN vitamin and mineral doses were administered to all subjects. Plasma concentrations of the antioxidant glutathione (GSH) and the antioxidant nutrients alpha-tocopherol, vitamin C, and zinc were determined at baseline (initiation of study PN) and again after 7 d of study PN. Data were analyzed for the total study cohort and within the pancreatic surgery and non-pancreatic (cardiac, vascular, and colonic) surgery patient subgroups. **RESULTS:** Mean plasma antioxidant concentrations were within or slightly below the normal ranges at baseline. However, a larger percentage of patients demonstrated below-normal baseline plasma concentrations of GSH (59%), vitamin C (59%), and zinc (68%), respectively. A smaller percentage of patients exhibited below-normal plasma alpha-tocopherol levels (21%). Study PN significantly improved plasma zinc levels in the entire study group and in each surgical subgroup. Gln-PN significantly improved the change in plasma levels of reduced GSH from baseline to day 7 in the non-pancreatic surgery patients (PN -0.27 μ M versus Gln-PN +0.26 μ M, $P < 0.03$). **CONCLUSION:** Low plasma levels of key antioxidants were common in this group of patients in the SICU despite

administration of PN containing conventional micronutrients. Compared with standard PN, Gln-supplemented PN improved plasma GSH levels in patients in the SICU after cardiac, vascular, or colonic operations.

Oral glutamine in addition to parenteral nutrition improves mortality and the healing of high-output intestinal fistulas.

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OBJECTIVE: Anastomotic leakage is one of the most important causes of morbidity and mortality in gastrointestinal surgery. We investigated the effect of oral glutamine on the healing of high-output intestinal fistula. **SETTING:** A tertiary University Hospital of the University of Mato Grosso, Cuiaba, Brazil. **Patients and methods:** 28 patients (25 males and 3 females; median age = 45 [18-71] years old) admitted with high output post-operative small bowel fistulas (median volume in 24 h: 850 [600-2,200] mL) during a 4 years period were retrospectively studied. **INTERVENTIONS:** In the first two years 19 (67.9%) patients received only TPN as the initial nutritional support. In the last two years however, due to a change in the protocol for the nutritional support in cases of intestinal fistula 9 patients (32.1%) received oral glutamine (0.3 g/kg/day; 150 mL/day) in addition to TPN. Endpoints of the study were mortality, resolution of the fistula, and length of hospital stay (LOS). **RESULTS:** The overall mortality was 46.4% (13 patients). Fistula closure was observed in all other 15 patients (53.6%) that survived. In the subset of survived patients LOS was similar in those who received or not received glutamine. The multivariate regression analysis showed that resolution of the fistula was 13 times greater in patients that received oral glutamine (OR = 13.2 (95% CI = 1.1-160.5); p = 0.04) and 15 times greater in non-malnourished patients (OR = 15.4 [95% CI = 1.1-215.5]; p = 0.04). **CONCLUSIONS:** We conclude that oral glutamine accelerated the healing and diminished the mortality in this series of patients with post-operative high-output intestinal fistula receiving TPN.

Glutamine-enriched enteral nutrition in very low-birth-weight infants: effect on the incidence of allergic and infectious diseases in the first year of life.

[Arch Pediatr Adolesc Med. 2007 Nov;161\(11\):1095-101](#)

OBJECTIVE: To determine the effect of glutamine-enriched enteral nutrition in very low-birth-weight infants on the incidence of allergic and infectious diseases during the first year of life. **DESIGN:** Follow-up study. **SETTING:** Tertiary care hospital. **PARTICIPANTS:** All surviving infants who participated in a trial of glutamine-enriched enteral nutrition in very low-birth-weight infants. **INTERVENTION:** Enteral glutamine supplementation (l-glutamine, 0.3 g/kg per day) from 3 through 30 days of life. **MAIN OUTCOME MEASURES:** The incidence of allergic and infectious diseases during the first year of life, as assessed by means of validated questionnaires. **RESULTS:** Seventy-seven of 90 infants (86%) participated in the follow-up study. Baseline patient, maternal, and environmental characteristics did not differ between the glutamine-supplemented (n = 37) and control (n = 40) groups, except for the incidence of serious neonatal infections and child care attendance. After adjustment for confounding factors, the risk for atopic dermatitis was lower in the glutamine-supplemented group (odds ratio [OR], 0.13; 95% confidence interval [CI], 0.02-0.97). However, the incidence of bronchial hyperreactivity (OR, 0.34; 95% CI, 0.10-1.21) and infections of the upper respiratory (OR, 0.99; 95% CI, 0.35-2.79), lower respiratory (OR, 0.39; 95% CI, 0.13-1.24), and gastrointestinal (OR 1.25, 95% CI 0.23-6.86) tracts was not different between the treatment groups. **CONCLUSIONS:** Glutamine-enriched enteral nutrition in very low-birth-weight infants decreased the incidence of atopic dermatitis during the first year of life but had no effect on the incidence of bronchial hyperreactivity and infectious diseases during the first year of life.

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