TOP Journal Club

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Nutrition support and treatment of motility disorders in critically ill patients - Results of a survey on German intensive care units.

Eur J Anaesthesiol. 2007 Sep 21;:1-9

SummaryBackground and objectiveTo evaluate the current clinical attitude in enteral nutrition support and motility disorders in adult critically ill patients on German intensive care units. METHODS: A total of 1493 questionnaires, including 25 items on the medical environment, treatment of motility disorders and enteral nutrition, were sent to German intensive care units in September 2005. Responses were collected during a 2-month period. RESULTS: A total of 593 questionnaires were returned (response rate 41%). The intensive care units were mainly led by anaesthesiologists (63%) or internists (17%). Standard nutrition protocols were used in 44%. Feeding was mainly started as a combined enteral-parenteral regimen (70%). Early enteral nutrition was performed in 58% using a volume of 250-500 mL (66%) and increased by 200-400 mL day-1 (55%). It was mainly delivered by gastric tube (76%) via continuous pump systems (72%) with short interruption intervals of <4 h (86%). Enteral nutrition solutions were mainly standard polymeric formulae (86%). Modified solutions for diabetics and those with renal or liver failure were uncommonly used; immunonutrition did not play a role. Prokinetic agents, especially metoclopramide, laxatives and neostigmine, were routinely used (39%). Further therapeutic options in motility dysfunction included purgative enemas (96%), gastrografin (72%) and colon massage (39%). CONCLUSIONS: The concept of early enteral nutrition has been well established and approved in German intensive care units, though the recommendations only meet level C criteria in the current ESPEN guidelines. The current survey may serve for further updates on practical nutrition support in intensive care medicine.

Clinical Significance of Perioperative Immunonutrition for Patients with Esophageal Cancer.

World J Surg. 2007 Sep 18

BACKGROUND: We hypothesized that preoperative and/or postoperative enteral immune-enhanced formulas that are supplemented with arginine, omega-3 fatty acids, and RNA may reduce postoperative complications in patients undergoing esophagectomy for thoracic esophageal squamous cell carcinoma (ESCC). METHODS: Forty patients who underwent esophagectomy were divided into three groups: group A (n = 20) received a control enteral diet (Erental) through the jejunostomy after surgery. group B (n = 6) received an enteral diet supplemented with immune-enhancing substrates (Impact) containing arginine, omega-3 fatty acids, and RNA after surgery. group C (n = 14) received the impact before and after surgery. RESULTS: Lymphocyte counts in group C on postoperative day (POD) 7 were somewhat higher than that in group A (p = 0.07) and significantly higher than in group B (p = 0.03). Furthermore the incidence of incisional wound infection in group C was significantly lower than that in group A (p = 0.03). Moreover, the duration of postoperative systemic inflammatory response syndrome (SIRS) was significantly shorter in group C than in group A (p < 0.05). CONCLUSIONS: This study reveals that the perioperative immune-enhanced formula may be superior to postoperative control enteral formulas in terms of reducing surgical wound infection and postoperative SIRS, which may result in serious postoperative complications for patients who have undergone esophagectomy.

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.

Preoperative immunonutrition suppresses perioperative inflammatory response in patients with major abdominal surgery-a randomized controlled pilot study.

Ann Surg Oncol. 2007 Oct;14(10):2798-806

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

Cancer prevention by dietary bioactive components that target the immune response.

Curr Cancer Drug Targets. 2007 Aug;7(5):459-64

Dietary bioactive food components that interact with the immune response have considerable potential to reduce the risk of cancer. Reduction of chronic inflammation or its downstream consequences may represent a key mechanism that can be reduced through targeting signal transduction or through antioxidant effects. Major classes of macronutrients provide numerous examples, including amino acids such as glutamine or arginine, lipids such as the omega-3 polyunsaturated fatty acids, DHA or EPA, or novel carbohydrates such as

various sources of beta-glucans. Vitamins such as C and E are commonly used as antioxidants, while zinc and selenium are minerals with a wide spectrum of impacts on the immune system. Some of the most potent immunomodulators are phytochemicals such as the polyphenols, EGCG or curcumin, or isothiocyanates such as PEITC. There is accumulating evidence for cancer prevention by probiotics and prebiotics, and these may also affect the immune response. Genomic approaches are becoming increasingly important in characterising potential mechanisms of cancer prevention, optimising the rational selection of dietary bioactive food components, or identifying humans with differing nutrient requirements for cancer protection.

Omega-3 fatty acids and athletics.

Curr Sports Med Rep. 2007 Jul;6(4):230-6.

Human beings evolved consuming a diet that contained about equal amounts of y-6 and y-3 essential fatty acids. Today, in Western diets, the ratio of y-6 to y-3 fatty acids ranges from approximately 10:1 to 20:1 instead of the traditional range of 1:1 to 2:1. Studies indicate that a high intake of y-6 fatty acids shifts the physiologic state to one that is prothrombotic and proaggregatory, characterized by increases in blood viscosity, vasospasm, and vasoconstriction, and decreases in bleeding time. y-3 fatty acids, however, have anti-inflammatory, antithrombotic, antiarrhythmic, hypolipidemic, and vasodilatory properties. Excessive radical formation and trauma during high-intensity exercise leads to an inflammatory state that is made worse by the increased amount of y-6 fatty acids in Western diets, although this can be counteracted by eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). For the majority of athletes, especially those at the leisure level, general guidelines should include EPA and DHA of about 1 to 2 g/d at a ratio of EPA:DHA of 2:1.

Differential immunomodulation with long-chain n-3 PUFA in health and chronic disease.

Proc Nutr Soc. 2007 May;66(2):237-59.

The balance of intake of n-6 and n-3 PUFA, and consequently their relative incorporation into immune cells, is important in determining the development and severity of immune and inflammatory responses. Some disorders characterised by exaggerated inflammation and excessive formation of inflammatory markers have become among the most important causes of death and disability in man in modern societies. The recognition that long-chain n-3 PUFA have the potential to inhibit (excessive) inflammatory responses has led to a large number of clinical investigations with these fatty acids in inflammatory conditions as well as in healthy subjects. The present review explores the presence of dose-related effects of long-chain n-3 PUFA supplementation on immune markers and differences between healthy subjects and those with inflammatory conditions, because of the important implications for the transfer of information gained from studies with healthy subjects to patient populations, e.g. for establishing dose levels for specific applications. The effects of long-chain n-3 PUFA supplementation on ex vivo lymphocyte proliferation and cytokine production by lymphocytes and monocytes in healthy subjects have been studied in twenty-seven, twenty-five and forty-six treatment cohorts respectively, at intake levels ranging from 0.2 g EPA+DHA/d to 7.0 g EPA+DHA/d. Most studies, particularly those with the highest quality study design, have found no effects on these immune markers. Significant effects on lymphocyte proliferation are decreased responses in seven of eight cohorts, particularly in older subjects. The direction of the significant changes in cytokine production by lymphocytes is inconsistent and only found at supplementation levels > or =2.0 g EPA+DHA/d. Significant changes in inflammatory cytokine production by monocytes are decreases in their production in all instances. Overall, these studies fail to reveal strong dose-response effects of EPA+DHA on the outcomes measured and suggest that healthy subjects are relatively insensitive to immunomodulation with long-chain n-3 PUFA, even at intake levels that substantially raise their concentrations in phospholipids of immune cells. In patients with inflammatory conditions cytokine concentrations or production are influenced by EPA+DHA supplementation in a relatively large number of studies. Some of these studies suggest that local effects at the site of inflammation might be more pronounced than systemic effects and disease-related markers are more sensitive to the immunomodulatory effects, indicating that the presence of inflamed tissue or 'sensitised' immune cells in inflammatory disorders might increase sensitivity to the immunomodulatory effects of long-chain n-3 PUFA. In a substantial number of these studies clinical benefits related to the inflammatory state of the condition have been observed in the absence

of significant effects on immune markers of inflammation. This finding suggests that condition-specific clinical end points might be more sensitive markers of modulation by EPA+DHA than cytokines. In general, the direction of immunomodulation in healthy subjects (if any) and in inflammatory conditions is the same, which indicates that studies in healthy subjects are a useful tool to describe the general principles of immunomodulation by n-3 PUFA. However, the extent of the effect might be very different in inflammatory conditions, indicating that studies in healthy subjects are not particularly suitable for establishing dose levels for specific applications in inflammatory conditions. The reviewed studies provide no indications that the immunomodulatory effects of long-chain n-3 PUFA impair immune function or infectious disease resistance. In contrast, in some conditions the immunomodulatory effects of EPA+DHA might improve immune function.

Omega-3 fatty acids and cardiovascular disease.

Curr Opin Clin Nutr Metab Care. 2007 Mar;10(2):129-35

PURPOSE OF REVIEW: In the last 2 years in the cardiovascular field eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) have been investigated in terms of their epidemiology and vascular biology, and in large-scale intervention trials, and incorporated into the guidelines of cardiac societies. EPA and DHA have advanced from scientific research into everyday practice, a development reviewed here. RECENT FINDINGS: EPA and DHA are antiarrhythmic on the supraventricular and ventricular levels, besides having an anti-atherosclerotic effect. Fish rich in EPA and DHA, contaminated with methyl-mercury, appears less protective. Large-scale clinical trials demonstrated that morbidity can be reduced with EPA even in a population already consuming large amounts of EPA and DHA. Therapy with EPA and DHA can be monitored with the omega-3 index, a risk factor for sudden cardiac death. EPA and DHA appear to be cost-saving in the USA, and, as Omacor, are cost-effective in several European countries. SUMMARY: European and American Cardiac Societies incorporated EPA and DHA into recent treatment guidelines for myocardial infarction, prevention of cardiovascular disease, treatment of ventricular arrhythmias and prevention of sudden cardiac death. Physicians need to reduce the burden of cardiovascular disease by advocating EPA and DHA to all patients likely to benefit.

Dietary omega-3 fatty acids for women.

Biomed Pharmacother. 2007 Feb-Apr;61(2-3):105-12

This review details the specific needs of women for omega-3 fatty acids, including alpha linoleic acid (ALA) and the very long chain fatty acids eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). Omega-3 fatty acid (dietary or in capsules) ensures that a woman's adipose tissue contains a reserve of these fatty acids for the developing fetus and the breast-fed newborn infant. This ensures the optimal cerebral and cognitive development of the infant. The presence of large quantities of EPA and DHA in the diet slightly lengthens pregnancy, and improves its quality. Human milk contains both ALA and DHA, unlike that of other mammals. Conditions such as diabetes can alter the fatty acid profile of mother's milk, while certain diets, like those of vegetarians, vegans, or even macrobiotic diets, can have the same effect, if they do not include seafood. ALA, DHA and EPA, are important for preventing ischemic cardiovascular disease in women of all ages. Omega-3 fatty acids can help to prevent the development of certain cancers, particularly those of the breast and colon, and possibly of the uterus and the skin, and are likely to reduce the risk of postpartum depression, manic-depressive psychosis, dementias (Alzheimer's disease and others), hypertension, toxemia, diabetes and, to a certain extend, age-related macular degeneration. Omega-3 fatty acids could play a positive role in the prevention of menstrual syndrome and postmenopausal hot flushes. The normal western diet contains little ALA (less than 50% of the RDA). The only adequate sources are rapeseed oil (canola), walnuts and so-called "omega-3" eggs (similar to wild-type or Cretan eggs). The amounts of EPA and DHA in the diet vary greatly from person to person. The only good sources are fish and seafood, together with "omega-3" eggs.

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