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Fresenius Kabi
Caring for Life
Introduction

Welcome to Fresenius Kabi’s Quarterly Abstract Bulletin for enteral nutrition. We have reviewed the following journals over the past three months, and selected any nutrition support related articles:

- Age and Ageing
- American Journal of Clinical Nutrition
- Archives of diseases in Childhood
- BMJ
- British Journal of Community Nursing
- British Journal of Nursing
- Clinical Nutrition
- Complete Nutrition
- Critical Care Medicine
- Current Opinion in Clinical Nutrition and Metabolic Care
- European Journal of Clinical Nutrition
- Gastrointestinal Nursing
- GUT
- Intensive Care Medicine
- Intensive and Critical Care Nursing
- Journal of Community Nursing
- Journal of Human Nutrition and Dietetics
- Journal of Parenteral and Enteral Nutrition
- Journal of Woundcare
- Lancet
- Nutrition
- Nutrition in Clinical Practice
- Nursing and Residential Care
- Nursing Older People
- Nurse Prescribing
- Nursing Standard
- Nursing Times
- Paediatric Nursing

We do recommend that the original article is used for the full details and results.

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This publication and previous editions are also available online at www.fresenius-kabi.co.uk under the nutrition service section.
Effect of an enteral diet supplemented with a specific blend of amino acid on plasma and muscle protein synthesis in ICU patients

O Mansoor, D Breuillé, F Béchereau, C Buffière, C Pouyet, B Beaufrère, J Vuichoud, M Van’t-Of and C Obled


Abstract
Background & aim: Polytrauma patients are characterized by a negative nitrogen balance and muscle wasting. Standard nutrition is relatively inefficient to improve muscle protein turnover. The aim of this study was to investigate the effect of enteral nutrition (EN) supplemented with specific amino acids on protein metabolism in polytrauma patients. Methods: In a double blind study, 12 polytrauma patients were randomized to receive EN supplemented with either a mixture of cysteine, threonine, serine and aspartate (AA patients) or alanine at isonitrogenous levels (Ala patients). An intravenous infusion of [1-13C]-leucine was performed in the fed state between day 9 and 12 post-injury (Df) in patients and in a group of healthy volunteers (n=8) (EN+Ala) to measure whole body leucine kinetics, plasma and muscle protein synthesis rates. Nitrogen balance, 3-methyl histidine excretion were measured from day 3 to Df. Results: The contribution of total plasma proteins to whole body protein synthesis was greatly increased, from 11% in healthy volunteers to about 25% in polytrauma patients. AA supplementation had no effect on nitrogen balance, leucine kinetics or plasma protein synthesis in patients. In contrast, the urinary excretion of 3-methyl histidine tended to decrease along the study in the AA supplemented group compared to an increase in the Ala group. Muscle protein synthesis tended to be higher in the AA group than in the Ala group (46%, P=0.065). Conclusion: During injury, an increased supply of cysteine, threonine, serine and aspartate could be able to better cover the specific amino requirements, thus resulting in improved muscle protein synthesis without impairment of acute phase protein synthesis.

Cancer wasting and quality of life react to early individualized nutritional counselling!

P Ravasco, I M Grillo and M Camilo


Abstract
To devise a meaningful nutritional therapy in cancer, a greater understanding of nutritional dimensions as well as patients’ expectations and disease impact is essential. We have shown that nutritional deterioration in patients with gastrointestinal and head and neck cancer was multifactorial and mainly determined by the tumour burden and location. In a larger cohort, stage and location were yet again the major determinants of patients’ quality of life (QoL), despite the fact that nutritional deterioration combined with intake deficits were functionally more relevant than cancer stage. Based on this framework, the potential role of integrated oral nutritional support on outcomes was investigated. In a pilot study using individualized nutritional counselling on a heterogeneous patient population, the achieved improvement of nutritional intake was proportional to a better QoL. The role of early nutritional support was further analysed in a prospective randomized controlled trial in head and neck cancer patients stratified by stage undergoing radiotherapy. Pre-defined outcomes were: nutritional status and intake, morbidity and QoL, at the end and 3 months after radiotherapy. Nutritional interventions, only given during radiotherapy, consisted of three randomization arms: (1) individualized nutritional counselling vs. (2) ad libitum diet+high protein supplements vs. (3) ad libitum diet. Nutritional interventions 1 and 2 positively influenced outcomes during radiotherapy; however, 3 months after its completion individualized nutritional counselling was the single method capable of sustaining a significant impact on patients’ outcomes. The early provision of the appropriate mixture of foods and textures using regular foods may modulate outcomes in cancer patients.
Nutritional advice and treatment by dietitians to patients with amyotrophic lateral sclerosis/motor neurone disease: a survey of current practice in England, Wales, Northern Ireland and Canada

A Rio and E Cawadias

Abstract
Background: The management of amyotrophic lateral sclerosis/motor neurone disease (ALS/MND) has shifted from an attitude of nihilism to treatments that prolong survival and offer hope. Nutrition is an integral component of ALS/MND care requiring coordination among acute and community multi-disciplinary teams (MDT). Evidence-based nutrition guidelines exist for this patient group but their use among dietitians is unknown. The aim of this study was to survey the knowledge, practice and guideline use of dietitians working in ALS/MND centres/clinics across England, Wales, Northern Ireland (EWNI) and Canada.

Method: Dietetic contact details were obtained from the Motor Neurone Disease Association (MNDA) and the ALS Society of Canada (ALSSC) websites. Telephone interviews were conducted with 23 dietitians using a standardized questionnaire.

Results: Multi-disciplinary team membership was high (78%). Only 22% dietitians had >4-years experience in ALS/MND care. Dietitians reported using body weight, percentage weight loss (PWL) and body mass index (BMI) to assess nutritional status. Equations used to estimate energy and protein requirements differed. Most frequent dietary advice was high calorie, texture modification and prescription nutritional supplements. Artificial nutrition and hydration (ANH) was discussed when patients developed dysphagia, energy intake was inadequate, weight loss of 10% or forced vital capacity (FVC) was reduced. A percutaneous endoscopic gastrostomy (PEG) service was available at all clinics/centres.

Conclusion: Nutritional assessment techniques and dietary advice should be standardized. Dietetic collaboration at national and international level is recommended to reduce professional isolation. Training and support in ALS/MND nutrition should be made available as part of post-dietetic registration. Further dietetic research is required to stimulate nutritional care.

Energy requirements in frail elderly people: A review of the literature

C Gaillard, E Alix, A Sallé, G Berrut and P Ritz

Abstract
This review collates studies of healthy, sick, underweight (BMI≤21 kg/m²) and very elderly people (≥90 yr), in whom resting energy expenditure (REE) was measured using indirect calorimetry. We have observed the following: (1) REE, when adjusted for differences in both body weight and fat-free mass (FFM), is similar in healthy and in sick elderly people being 20 and 28 kcal/kg of FFM per day, respectively, (2) their nutritional status influences their energy requirements given that weight-adjusted REE increases in line with a decrease in BMI, (3) total energy expenditure is lower in sick elderly people given that their physical activity level, i.e. the ratio of total energy expenditure to REE, is reduced during disease averaging at 1.36, (4) energy intake (EI) being only 1.23×REE is insufficient to cover energy requirements in sick elderly patients, whereas the EI of healthy elderly people appears sufficient to cover requirements, and finally, (5) gender ceases to be a determinant of REE in people aged 60 yr or over, with the Harris & Benedict equation capable of accurately predicting mean REE in this population, whether healthy or sick.
Response of albumin synthesis to oral nutrients in young and elderly subjects

G Caso, J Feiner, I Mileva, L J Bryan, P Kelly, K Autio, M C Gelato and M A McNurlan


Abstract

**Background:** The synthesis of albumin after oral ingestion of nutrients provides a means of storing amino acids, which can be made available during periods of fasting. **Objective:** This study was undertaken to see whether the response of albumin synthesis to the oral intake of nutrients is compromised in elderly subjects. **Design:** Albumin synthesis was determined from the incorporation of 43 mg L-[2H5]phenylalanine/kg body wt. Eight elderly subjects (aged >60 y) and 8 young subjects (aged 21–35 y) were studied on 3 separate occasions: after the intake of water, a liquid meal (with 15% of energy from protein, 30% of energy from fat, and 55% of energy from carbohydrate), or an isonitrogenous but not isocaloric meal containing only protein. **Results:** Mean (±SEM) albumin synthesis, expressed as an absolute rate (ie, the amount of albumin synthesized per day), was significantly lower in elderly subjects (108 ± 7 mg · kg body wt⁻¹ · d⁻¹) than in young subjects (141 ± 7 mg · kg body wt⁻¹ · d⁻¹). In response to the complete meal, albumin synthesis was significantly increased in both the elderly (144 ± 7 mg/kg body wt⁻¹ · d⁻¹) and the young (187 ± 11 mg · kg body wt⁻¹ · d⁻¹) subjects. The protein component of the meal was sufficient to stimulate albumin synthesis in both the elderly (147 ± 14 mg · kg body wt⁻¹ · d⁻¹) and the young (182 ± 6 mg · kg body wt⁻¹ · d⁻¹) subjects. **Conclusions:** Elderly subjects have lower rates of albumin synthesis than do young subjects during fasting, but they stimulate albumin synthesis proportionately in response to the oral ingestion of protein. The intakes of additional fat and carbohydrate do not stimulate albumin synthesis further.

Is serum albumin a good marker for malnutrition in the physically impaired elderly?

M Kuzuya, S Izawa, H Enoki, K Okada and A Iguchi


Abstract

**Background and Aims:** Although serum albumin is well known as a marker of nutritional status, it has remained unclear whether impaired physical function affects serum albumin concentrations in older people. We examined whether hypoalbuminemia can be used as a marker of malnutrition in elderly subjects with various levels of physical impairment. **Methods:** A total of 262 elderly subjects without acute illness were enrolled from various geriatric settings. For the nutritional assessment, serum albumin, total cholesterol, anthropometric measurements, and subjective global assessment (SGA) were determined. Physical function was evaluated by rating score of activity of daily living (ADL). **Results:** As a whole, participants’ serum albumin levels correlated with various nutritional parameters including anthropometric measurements and levels of serum total cholesterol as well as the SGA evaluation. However, after adjusting for age and gender, serum albumin levels in participants with a low ADL function did not correlate with nutritional parameters. Approximately 80% participants with low ADL function who were evaluated as being well nourished according to SGA evaluation had serum albumin levels lower than 35g/l. **Conclusions:** The utility of serum albumin and the traditional cutoff (35g/l) in older people with low ADL function is questionable even among those without inflammation.
Failure to thrive: the prevalence and concurrence of anthropometric criteria in a general infant population

E M Olsen, J Petersen, A M Skovgaard, B Weile, T Jørgensen and C M Wright
Archives of Disease in Childhood (2007) 92(2): 109-114

Abstract
Background: Failure to thrive (FTT) in early childhood is associated with subsequent developmental delay and is recognised to reflect relative undernutrition. Although the concept of FTT is widely used, no consensus exists regarding a specific definition, and it is unclear to what extent different anthropometric definitions concur.
Objective: To compare the prevalence and concurrence of different anthropometric criteria for FTT and test the sensitivity and positive predictive values of these in detecting children with “significant undernutrition”, defined as the combination of slow conditional weight gain and low body mass index (BMI).
Methods: Seven criteria of FTT, including low weight for age, low BMI, low conditional weight gain and Waterlow’s criterion for wasting, were applied to a birth cohort of 6090 Danish infants. The criteria were compared in two age groups: 2–6 and 6–11 months of life. Results: 27% of infants met one or more criteria in at least one of the two age groups. The concurrence among the criteria was generally poor, with most children identified by only one criterion. Positive predictive values of different criteria ranged from 1% to 58%. Most single criteria identified either less than half the cases of significant undernutrition (found in 3%) or included far too many, thus having a low positive predictive value. Children with low weight for height tended to be relatively tall. Conclusions: No single measurement on its own seems to be adequate for identifying nutritional growth delay. Further longitudinal population studies are needed to investigate the discriminating power of different criteria in detecting significant undernutrition and subsequent outcomes.

Nutritional status, perceived body image and eating behaviours in adults with cystic fibrosis


Abstract
Background & Aims: Achieving and maintaining an ideal nutritional status is the primary aim of the nutritional management of cystic fibrosis (CF). It is unclear how nutritional interventions impact on patients’ perceptions and behaviours concerning body image and eating. This work aimed to provide a psychosocial profile and compare CF patients receiving (a) enteral tube feeding, (b) nutritional supplements, (c) no nutritional interventions, and (d) healthy controls. Methods: A cross-sectional questionnaire design was employed. Age, gender, lung function, and body mass index were recorded. Subjects completed measures of eating attitudes, perceived and desired body shape, body image, self-esteem and quality of life (QoL). Results: A minority of CF patients reported disordered eating. Those receiving nutritional interventions engaged in less dieting behaviour. All CF groups, especially intervention groups, received more pressure from others to eat. For females, control groups desired to be slimmer whereas intervention groups desired to be heavier. Healthy males were content with their body whereas CF males wished to be heavier. Patients receiving enteral tube feeding were less satisfied with their body image, reported lower self-esteem and poorer QoL. Conclusion: Body image and eating behaviours are important considerations of nutritional interventions for maintaining QoL.
Update on Enteral Nutrition Support for Cystic Fibrosis

J M Erskine, C Lingard and M Sontag


Abstract

Cystic fibrosis (CF) is an inherited disease affecting the respiratory, gastrointestinal, hepatobiliary, and reproductive systems. Nutrition status in persons with CF is often compromised due to increased energy needs, frequent infections, pancreatic insufficiency, lung disease, or CF-related diabetes. Maintaining good nutrition status has been associated with better pulmonary function, reduced hospitalizations, and increased longevity. Nutrition support as oral supplementation (used in >37% of the CF population) or tube feeding (used in >13% of the CF population) is often required for children and adults with CF. The purpose of this update is to describe current consensus and evidence for enteral nutrition support guidelines, reported complications of enteral feeding in the CF population, evidence of expected outcomes, and to discuss related areas requiring further research. A case report is provided to illustrate potential outcomes of aggressive enteral support.

Effect of exclusive enteral nutritional treatment on plasma antioxidant concentrations in childhood Crohn’s disease

A K Akobeng, K Richmond, V Miller and A G Thomas


Abstract

Background & Aims: Oxidative stress and depletion of antioxidants may play a role in the pathogenesis of Crohn’s disease (CD). The aim of this study was to determine the effect of exclusive enteral nutrition, which is increasingly being used as primary therapy for CD, on plasma antioxidant concentrations in children with active CD.

Methods: In a double-blind randomised controlled trial, 15 children with active CD (mean age, 11.3 years, range 6.8–15.7) attending a paediatric gastroenterology referral centre, were assigned to receive either a standard polymeric diet (Group S, n=8) or a glutamine-enriched polymeric diet (Group G, n=7) as primary therapy for active CD. Plasma concentrations of selenium, urates, vitamin A, vitamin E, vitamin C, glutathione, and also malondialdehyde (MDA) were measured at baseline and after 4 weeks of exclusive enteral nutritional treatment.

Results: Mean (95% CI) selenium concentration {11.3 mg/l (10.3, 12.4) to 9.4 mg/l (8.7, 10.1), P=0.03}. The concentrations of vitamin A, urates, glutathione and MDA did not change significantly over the study period. Glutamine supplementation did not have any significant effect on plasma antioxidant concentrations.

Conclusions: Significant changes in circulating antioxidant concentrations occurred in children with active CD receiving exclusive enteral nutritional treatment. Glutamine supplementation was not beneficial in improving plasma antioxidant status.
Nutrition Issues in Pediatric Crohn’s Disease

A E Wiskin, S A Wootton and R M Beattie

Abstract
Twenty-five percent of inflammatory bowel disease (IBD) diagnoses present in childhood, with Crohn’s disease (CD) being the most common type. Many children have poor nutrition status at presentation of the disease, which may worsen during the clinical course, with a significant number of children having impaired linear growth. The cause of this poor nutrition status is complex, and contributing factors include inadequate intake, malabsorption, altered energy demands, and losses through stool, particularly in colitis. The principal aim of medical management is to induce disease remission, with minimal side effects, thereby enabling normal growth and development. This must include active consideration of the nutrition needs of such children and how they may be best met. However, our understanding of the manner in which the disease process affects the energy demands of children with CD or how poor nutrition, in turn, may affect the disease course is limited. This may constrain the efficacy and effectiveness of standard therapeutic approaches to care. This review explores the many factors of relevance in the delivery of nutrition support to children with inflammatory bowel disease, and explores the role of exclusive enteral nutrition as a corticosteroid-sparing strategy to induce remission in children with active Crohn’s disease.

Prevalence of home artificial nutrition in Italy in 2005: A survey by the Italian Society for Parenteral and Enteral Nutrition (SINPE)

L Pironi, M Candusso, A Biondo, A Bosco, P Castaldi, F Contaldo, E Finocchiaro, A Giannoni, S Mazzuoli, P Orlandoni, A Palozzo, C Panella, S Pastò, E Ruggeri, G Sandri, E Stella, G Toigo and the Italian Society for Parenteral and Enteral Nutrition (SINPE) Executive Committee

Abstract
Aim: To determine the prevalence (cases per million inhabitants) of home artificial nutrition (HAN), enteral (HEN) and parenteral (HPN), in Italy, grouped according to administrative regions, patient age and primary disease, and to analyze the impact both of the presence of an HAN regional regulation and of demographic characteristics.
Methods: In April 2005, the Regional Coordinators of the Italian Society for Parenteral and Enteral Nutrition (SINPE) recorded all the ongoing cases of HAN using a structured questionnaire and were asked to estimate the representativeness of the collected sample with respect to the total expected HAN. Results: A total of 6955 cases of HAN (93.5% adults, 6.5% pediatric patients 18 years) were recorded in 16 of the 20 Italian regions (80% of the Italian population; sample representativeness 78%). HAN prevalence 152.6 (83.9% HEN, 16.1% HPN); the HAN range among the regions was: prevalence 28.1–519.8; oncological disease 13.8–75.7%, neurological disease 15.5–79.9%, intestinal failure 1.3–14.0%. An HAN regulation was present in 11 regions. A positive association (P=0.012) was found between the number of years since the regulation was issued and the HAN prevalence, and also between the % neurological patients and the population density (P=0.130) and the % inhabitants ≥ 75 years (P=0.040). Conclusions: The need for HAN regards a great number of patients throughout the country; there are substantial differences between the regions with respect to both the prevalence and the use of HAN in various disease categories. A specific regulation may favor the development of HAN.
Immunonutrition in septic patients: A philosophical view of the current situation

G Bertolini, D Luciani and G Biolo

Abstract
Background & aims: Two different ways of thinking pervaded the history of science: rationalism and empiricism. In theory, these two paradigms are not necessarily in conflict. In practice, there has always been tension between them. The coming of evidence-based medicine put empiricism in a privileged position, but empiricism without a rationalistic guide could even be useless. The aim of this work is to present the tension between the rational reasons to administer immunonutrients to patients with sepsis and the controversial empirical evidence stemming from clinical trials. Methods: We reviewed the literature on immunonutrition in sepsis from the rationalist and the empiricist perspectives. Results: The large body of evidence for positive effects of immunonutrients in experimental models and the contradictory results from clinical trials make the discussion on immunonutrition in sepsis a typical example where the conflict between rationalism and empiricism hampered the advancement of knowledge and the implementation of new effective therapies into clinical practice. Conclusions: Future research projects involving immunonutrients should be based on robust knowledge of basic mechanisms of action to be properly addressed in clinical trials.

Clinical and biochemical outcomes after a randomized trial with a high dose of enteral arginine formula in postsurgical head and neck cancer patients

D A de Luis, O Izaola, L Cuellar, M C Terroba, T Martin and R Aller

Abstract
Objective: Patients with head and neck cancer undergoing surgery have a high incidence of postoperative complications. The aim of our study was to investigate whether postoperative nutrition of head and neck cancer patients, using a higher dose of arginine-enhanced diet (17 g/day) than previous studies, could improve nutritional variables as well as clinical outcomes, when compared with a control enteral diet. Design: Randomized clinical trial. Setting: Tertiary care. Subjects: A population of 72 patients with oral and laryngeal cancer was enrolled. Interventions: At surgery, patients were randomly allocated to two groups: (a) 35 patients receiving an arginine-enhanced formula with arginine (group I) and (b) 37 patients receiving an isocaloric, isonitrogenous enteral formula (group II). Results: No significant intergroup differences in the trend of the three plasma proteins (albumin, transferrin, prealbumin) and lymphocytes were detected. Episodes of diarrhea rate were equal in both groups (22.8% group I and 21.6% group II: NS). The postoperative infections complications were equal in both groups (5.7% group I and 5.4% group II: NS). Fistula (wound complication) was less frequent in enriched nutrition group (2.8% group I and 18.9% group II: P<0.05), whereas wound infection was similar in both groups. The length of postoperative stay was similar in both (27.9±21 vs 28.2±12 days; NS). Conclusions: At this dose, arginine-enhanced formula improves fistula rates in postoperative head and neck cancer patients without a high rate of diarrhea.
Optimizing the dose of glutamine dipeptides and antioxidants in critically ill patients: A phase I dose-finding study

D K Heyland, MD, R Dhaliwalm, A Day, J Drover, H Cote and P Wischmeyer

Abstract

**Background:** Supplementation with glutamine and antioxidants may be associated with an improvement in clinical outcomes, but the optimal dose of these substrates is unknown. The purpose of this study was to determine the safety of high doses of glutamine combined with antioxidants in critically ill patients.

**Methods:** We conducted a single-center, open-label, dose-escalating clinical trial. Mechanically ventilated adult patients with clinical evidence of hypoperfusion were sequentially enrolled to 1 of 5 groups. Group 1 (n = 30): no supplementation; group 2 (n = 7): 0.35 g/kg/d of glutamine IV; group 3 (n = 7): same as group 2 plus 15 g/d of glutamine and 150 µg of selenium enterally; group 4 (n = 7): same as group 2 plus 30 g/d of glutamine and 300 µg of selenium enterally; and group 5 (n = 7): same as group 4 plus an additional 500 µg of selenium IV. After enrollment, nutrients were started as soon as possible. All patients were fed enterally according to clinical practice guidelines.

**Results:** The primary outcomes for this study were change in sequential organ function assessment (SOFA) score and safety parameters. Secondary outcomes included whole blood glutathione (GSH), thiobarbituric acid reactive substances (TBARS), and blood cell entration. The slopes straighten out and the p values are no longer significant, suggesting a greater preservation of GSH levels with escalating doses. In group 2, the slope of the line representing TBARS was horizontal. With subsequent groups, the slopes decrease, and by group 5, this decrease reaches statistical significance (p = .03), suggesting a greater reduction in oxidative stress with the higher doses in group 5. The difference in slopes across all groups describing the mitochondrial RATIO is statistically significant (p = .001), again suggesting that, with higher doses, there is increased mitochondrial function.

**Conclusions:** The doses of glutamine and antioxidants tested in this study seem to be safe and may have positive effects on some mechanistic endpoints. A larger trial will be necessary to confirm their therapeutic effects.

Enteral Nutrition in Critically Ill Children: Are Prescription and Delivery According to Their Energy Requirements?

S Brasil de Oliveira Iglesias, H Pons Leite, J Fernandez Santana e Meneses and W Brunow de Carvalho

Abstract

**Background:** The purpose of this study was to compare the differences between prescribed and delivered energy among critically ill children and to identify the factors that impede the optimal delivery of enteral nutrition in the first 5 days of nutrition support.

**Methods:** In a prospective cohort study, we evaluated 55 critically ill children aged 8.2 ± 11.4 months (0–162.3 months), who were fed for 2 days through a gastric or postpyloric tube. The patients were followed from admission until day 10 of enteral nutrition. Prescribed and delivered energy were recorded daily and compared with each other and with the estimated basal metabolic rate (BMR). The Paediatric Index of Mortality 2 (PIM 2) was used to estimate illness severity.

**Results:** The ratio of delivered:required energy was <90% in 55.7% of the enteral nutrition days. Low prescription was the main reason for not achieving the energy goal in the first 5 days of enteral nutrition. Discrepancies between prescribed and delivered: energy were attributable to interruptions in feeding caused by clinical instability, airway management, radiologic and surgical procedures, and accidental feeding tube removal. The other factors associated with the delivery of less than required energy were PIM 2 ≤15%, gastrointestinal complications, dialysis, and use of α-adrenergic vasoactive drugs. The latter was the only variable in multivariate analysis that was associated with not ultimately achieving energy goal.

**Conclusions:** The prescription and delivery of energy were not adequate in >50% of enteral nutrition days. The gap between the effective administration and energy requirements can be explained by both underprescription and underdelivery. Administration of vasoactive drugs was the only variable independently associated with a low energy supply.
Nasojejunal tube placement in paediatric intensive care

A McDermott, N Tomkins and G Lazonby

Abstract
Nasojejunal delivery of enteral feeds is a safe and effective alternative to parenteral nutrition in critically ill children in whom intra-gastric feeding is usually poorly tolerated. A guideline for bedside placement of nasojejunal tubes (NJTs) was developed by a multi-disciplinary group. An audit of practice was carried out following implementation of the guideline. During the audit period 27 NJTs were successfully passed in 21 patients. The result of this innovation has been earlier initiation of nasojejunal feeding and an increase in bedside placement of NJTs within the PICU. Paediatric radiologists have reported a reduction in requests for NJT placement under X-ray screening and there has been a reduction in the use of medication and X-ray to place NJTs. Based on the audit data, 58 per cent of the children would have definitely or probably commenced parenteral nutrition had NJT placement and feeding been unsuccessful. The audit also demonstrated that 26 out of 27 nurses and doctors reported they found the guidelines easy or very easy to follow. Reducing variations in practice through the use of guidelines increases the frequency of jejunal feeding. This benefits critically ill patients by improving tolerance of enteral feeding for better nutritional outcomes.

Synbiotics, Prebiotics, Glutamine, or Peptide in Early Enteral Nutrition: A Randomized Study in Trauma Patients

A Spindler-Vesel, S Bengmark, I Vovk, O Cerovic and L Kompan

Abstract
Background: Since the hepatosplanchnic region plays a central role in development of multiple-organ failure and infections in critically ill trauma patients, this study focuses on the influence of glutamine, peptide, and synbiotics on intestinal permeability and clinical outcome. Methods: One hundred thirteen multiple injured patients were prospectively randomized into 4 groups: group A, glutamine; B, fermentable fiber; C, peptide diet; and D, standard enteral formula with fibers combined with Synbiotic 2000 (Synbiotic 2000 Forte; Medifarm, Sweden), a formula containing live lactobacilli and specific bioactive fibers. Intestinal permeability was evaluated by measuring lactulose-mannitol excretion ratio on days 2, 4, and 7. Results: No differences in days of mechanical ventilation, intensive care unit stay, or multiple-organ failure scores were found between the patient groups. A total of 51 infections, including 38 pneumonia, were observed, with only 5 infections and 4 pneumonias in group D, which was significantly less than combined infections (p = .003) and pneumonias (p = .03) in groups A, B, and C. Intestinal permeability decreased only in group D, from 0.148 (0.056–0.240) on day 4 to 0.061 (0.040–0.099) on day 7; (p < .05). In group A, the lactulose-mannitol excretion ratio increased significantly (p < .02) from 0.050 (0.013–0.116) on day 2 to 0.159 (0.088–0.311) on day 7. The total gastric retention volume in 7 days was 1150 (785–2395) mL in group D, which was significantly more than the 410 (382–1062) mL in group A (p < .02), and 620 (337–1190) mL in group C (p < .03). Conclusions: Patients supplemented with synbiotics did better than the others, with lower intestinal permeability and fewer infections.
Development of the Infant Intestine: Implications for Nutrition Support

C E Commare and K A Tappenden
Nutrition in Clinical Practice (2007) 22(2): 159-173

Abstract
The incidence of preterm births has continued to increase over the past 25 years, and therefore the optimal feeding of these infants is an important clinical concern. This review focuses on intestinal development and physiology, with a particular emphasis on developmentally immature functions of the preterm intestine and the resulting implications for nutrition therapies used to feed the preterm infant.

Testing nasogastric tube positioning in the critically ill: Exploring the evidence

S May

Abstract
Nutritional support in the critically ill is commonly delivered via a nasogastric tube. Correct positioning in the stomach must first be confirmed as inadvertent feeding into the lungs carries a high risk of mortality. The National Patient Safety Agency (2005) recommends the method of pH testing nasogastric tube aspirates to verify tube position. This article critically analyses the research supporting this method, and questions its reliability in critical ill patients whose gastric pH may well be altered due to prophylactic stress ulcer medications and continuous feeding regimens. There is a lack of quality research testing this method in the critically ill population. The theory-practice gap is addressed, and preliminary research behind use of techniques such as capnography is also examined.
Enteral Nutrition Support of Head and Neck Cancer Patients

A Raykher, L Russo, M Schattner, L Schwartz, B Scott and M Shike

Abstract
Patients with head and neck cancer are at high risk for malnutrition due to dysphagia from the tumor and treatment. Despite difficulty with oral intake, these patients usually have a normal stomach and lower gastrointestinal tract. Enteral nutrition support via percutaneous endoscopic gastrostomy (PEG) administered in the home by the patient helps to prevent weight loss, dehydration, nutrient deficiencies, treatment interruptions, and hospitalizations. It also improves quality of life. Successful management of these patients requires orderly care and follow-up by a multidisciplinary nutrition team.

Early versus late enteral nutritional support in adults with burn injury: a systematic review

J Wasiak, H Cleland, and R Jeffery

Abstract
Background: Burn injury increases the body’s metabolic demands, and therefore nutritional requirements. Provision of an adequate supply of nutrients is believed to lower the incidence of metabolic abnormalities, thus reducing septic morbidity, and improving survival rates. Enteral nutrition support is the best feeding method in a patient who is unable to achieve an adequate oral intake, but optimal timing of its introduction after burn injury (i.e. early versus late) needs to be established. The purpose of this review is to examine evidence for the effectiveness and safety of early versus late enteral nutrition support in adults with burn injury. Methods: An examination of randomized and controlled clinical trials using various medical databases such as The Cochrane Library (Issue 3, 2006), MEDLINE (from 1950), CINHAL (from 1982) and EMBASE (from 1980). Results: The trial evidence about the benefit of early enteral nutritional support on standardized clinical outcomes such as length of hospital stay and mortality remained inconclusive. Similarly, the question of whether early enteral feeding influenced or decreased metabolic rate, reduced septic and other complications remained uncertain. Conclusions: Promising results suggest early enteral nutrition support may blunt the hypermetabolic response to thermal injury, but it is insufficient to provide clear guidelines for practice. Further research incorporating larger sample sizes and rigorous methodology that utilizes valid and reliable outcome measures is essential.
Effect of nutritional support on glucose control

G Seematter and L Tappy


Abstract

Purpose of review: There is evidence that maintaining a normal glycemia level in critically ill patients has beneficial effects on outcome. Strategies aimed at lowering glycemia are based on the understanding of mechanisms regulating glucose metabolism. Recent findings: Activation of AMP protein kinase in skeletal muscle and in the liver leads to a reduction in glucose production, a stimulation of glucose uptake, and a lowering of glycemia. These mechanisms appear to be activated during exercise, or by the endogenous adipokine adiponectin. Alterations in adiponectin concentrations during critical illness may thus play a role in the metabolic stress responses. In addition, AMP-activated protein kinase is the target for drugs (metformin, thiazolidinediones), which may be of interest in the intensive care unit. Besides insulin, plasma glucose concentrations may be lowered by hypocaloric feeding, or by feeding ‘diabetic’ formula with low glucose content and supplemented with fructose. Whether such approaches lead to beneficial effects comparable to those observed with insulin remains to be established. Summary: Recent findings regarding the molecular mechanisms underlying glucose transport and metabolism are summarized, and potential strategies other than insulin are outlined which may contribute to lowering glycemia in critically ill patients.

Comparison of nutritional and inflammatory markers in dialysis patients with reduced appetite

J J Carrero, A R Qureshi, J Axelsson, C M Avesani, M E Suliman, S Kato, P Bárány, S Snaedal-Jonsdottir, A Alvestrand, O Heimbürger, B Lindholm and P Stenvinkel


Abstract

Background: Anorexia is common in chronic kidney disease and worsens as the disease progresses. Sex hormones and inflammatory cytokines may be related to feeding behavior. Objective: We hypothesized that appetite would be related to inflammation and outcome in hemodialysis patients but that sex may account for differences in the symptoms associated with poor appetite. Design: A cross-sectional study was conducted in patients undergoing prevalent hemodialysis (n = 223; 127 M; X ± SD age: 66 ± 14 y). Anthropometric markers of body composition, handgrip strength, and nutritional and inflammatory status were measured, and 3 groups according to their self-reported appetite were established. Overall mortality was assessed after 19 mo (range: 2–29 mo) of follow-up. Results: Poor appetite was associated with a longer vintage time, increased inflammation (higher serum concentrations of interleukin 6 and C-reactive protein), and a worse nutritional status (lower serum concentrations of insulin-like growth factor I, albumin, urea, and creatinine). However, across worsening appetite scale, handgrip strength was incrementally lower in men but not in women (multivariate analysis of variance). In a multivariate logistic regression analysis (pseudo r² = 0.19), appetite loss was associated with sex (odds ratio (OR): 0.41; 95% CI: 0.24, 0.72), insulin-like growth factor I (3.58; 2.10, 6.32), and C-reactive protein > 10 mg/L (2.39; 1.34, 4.11). Finally, appetite loss was associated with worse clinical outcome even after adjustment for age, sex, inflammation, dialysis vintage, and comorbidity (likelihood ratio = 44.3; P < 0.0001). Conclusions: These results show a close association among appetite, malnutrition, inflammation, and outcome in patients undergoing prevalent hemodialysis. Moreover, our data suggest that uremic men may be more susceptible than are women to inflammation-induced anorexia.
Further references on nutrition support published in the last quarter.

  This article looks at the fact that many stroke survivors have swallowing difficulties, which may increase the risk of chest infection, malnutrition, dehydration and tissue breakdown. It aims to enable care staff to identify the signs of dysphagia and provide the individual with appropriate care.

  This article looks at some of the causes of undernutrition, NICE guidelines for its management and the role of supplements.

  This article discusses some of the common eating and drinking problems associated with dementia and how these can be overcome.

- Colagiovanni L (2007) ‘We have got to change the attitude of nurses towards food and nutrition’. Nursing Times 103(12): 12
  This article looks at the concerns that people have about malnutrition in hospitals and how nurse attitudes affect the implementation of guidelines, moreover that the change must be supported at all levels.

  This article looks at the validity of Geriatric Nutritional Risk Index (GNRI), in predicting nutrition-related risk of complications in the elderly and therefore aims to investigate if GNRI might be a reliable detector of muscle dysfunction in institutionalised older people.

  This article compares resting energy expenditure, measured by indirect calorimetry, to values estimated by different predictive formulas in adolescent patients with anorexia nervosa.

  This article aims to determine the usefulness of body mass index (BMI) for age as a tool to prospectively identify pediatric cancer patients at risk of malnutrition and to determine the BMI percentile that would be required to identify at-risk patients.

  This article looks at resting energy expenditure (REE) of critically ill patients. The objective of this study was to investigate whether or not the type of lesion affects the metabolism level of critically ill patients treated with mechanical ventilation.

  This article looks at Chronic kidney disease and aims to evaluate the resting energy expenditure (REE) and its determinants in HD patients.

  This article evaluates a portable armband device for measuring daily and physical activity EE in comparison to the doubly labelled water (DLW) method in free-living individuals.

  This article looks at energy imbalance in critically ill, mechanically ventilated patients and investigates whether brief measurements of indirect calorimetry at any time of the day would give valid estimates of 24-hour energy expenditure.

  This article looks in depth at lipid rafts, the important membrane-signaling proteins contained, the modulation of these and their effects on inflammation and cancer in nutrition support.
Reference List

• Lecko C (2007) Patient safety: Pinning down the nutritional issues. Complete Nutrition 7(1): 8-10. This article discusses the NPSA’s role, responsibilities and planned projects surrounding nutrition as a patient safety issue.