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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.

Please note that due to copyright law our ability to copy and distribute clinical papers is restricted.
Using dietetic assistants to improve the outcome of hip fracture: a randomised controlled trial of nutritional support in an acute trauma ward

D G Duncan, S J Beck, K Hood and A Johansen

Objective: to examine how improved attention to nutritional status and dietary intake, achieved through the employment of dietetic assistants (DAs), will affect postoperative clinical outcome among elderly women with hip fracture. Design: open prospective randomised controlled trial, comparing conventional nursing care with the additional nutritional support provided by DA. Setting: thirty-eight bedded acute trauma ward in a teaching hospital. Participants: all but 11 of 344 consecutive admissions with acute nonpathological hip fracture were approached. Three hundred and eighteen (93%) agreed to inclusion. Sixteen were ineligible as they were immediately transferred to another acute ward, were managed conservatively or died preoperatively. Primary outcome measure: postoperative mortality in the acute trauma unit. Secondary outcome measures: postoperative mortality at 4 months after fracture, length of stay, energy intake and nutritional status. Results: DA-supported participants were less likely to die in the acute ward (4.1 versus 10.1%, \( P = 0.048 \)). This effect was still apparent at 4 month follow-up (13.1 versus 22.9%, \( P = 0.036 \)). DA-supported subjects had significantly better mean daily energy intake (1,105 kcal versus 756 kcal/24h, 95% CI 259–440 kcal/24 h, \( P < 0.001 \)), significantly smaller reduction in mid-arm circumference during their inpatient stay (0.39 cm, \( P = 0.002 \)) and nonsignificantly favourable results for other anthropometric and laboratory measurements. Conclusion: dietetic or nutrition assistants are being introduced in units across the UK. This, the largest ever study of nutritional support after hip fracture, shows that their employment significantly reduced patients’ risk of dying in the acute trauma unit; an effect that persisted at 4 month follow-up.

A personalized snack-based intervention for hip fracture patients: development, feasibility and acceptability

R J G Price, M E T McMurdo, A S Anderson

Abstract

Introduction: Undernutrition is common in older people admitted to hospital with hip fracture. Oral supplementation with sip feeds may be provided but compliance is a major problem. Objective: To develop a personalized snack-based intervention for practical implementation in hip fracture patients and to assess feasibility, adherence, acceptability and cost. Participants and methods Twenty-three older hip fracture patients with a mean age (SD) 84.1 (6.3) were provided with three between-meal snacks daily for 4 weeks following surgery. Dietary counselling, assessment of acceptability and feasibility were undertaken and costs of intervention calculated. Results: Sixteen of the 23 participants recruited completed the study. Mean estimated energy derived from the snacks provided 26% of daily energy requirements. Monitoring adherence proved problematic and stocktakes highlighted discrepancies. Although several participants reported that they did not usually eat between meals, overall the intervention was acceptable to participants. The cost of implementation was £21.29 per participant per week. Conclusions: Although it proved feasible, practical difficulties were encountered with implementation and adherence due to timing. A more appropriate time to deliver such an intervention may be after the acute phase is over and patients are back home. The costs compared favourably with the alternative of providing sip feeds.
Validity of the ActiReg system in assessing energy requirement in chronic obstructive pulmonary disease patients

D Arvidsson, F Slinde, A Nordenson, S Larsson and L Hulthén

Abstract

Background & aims: Malnutrition and weight loss are common in patients with chronic obstructive pulmonary disease (COPD) and effective nutritional support relies on accurate assessment of energy requirement. This could only be performed by measuring energy expenditure using objective methods. The aim of this study was to examine the validity of the ActiReg system in assessing energy requirement in non-hospitalized patients with severe COPD, using doubly labelled water (DLW) as criterion method.

Methods: Total energy expenditure (TEE) was assessed from 14 days DLW analysis in 13 patients. During the first 7 days TEE was simultaneously assessed using the ActiReg system, combining measured resting energy expenditure (REE) with physical activity monitoring. Results: A difference of -88 (782) kJ d⁻¹ (P=0.69) was observed between the ActiReg system and DLW. REE explained 52% of the variation in TEE from DLW. Adding physical activity energy expenditure from the ActiReg system (PAEE=TEE-REE) increased the explained variation in TEE from DLW with 16%.

Conclusions: The ActiReg system is valid in assessing energy requirement in non-hospitalized patients with severe COPD. The unique feature of being able to discriminate within both the low intensity activity range and moderate-to-high intensity activity range makes the ActiReg system a valuable tool in clinical nutritional support.

The impact of computerization of the nutrition support process on the nutrition support program in a tertiary care hospital in the Philippines: Report for the years 2000-2003

L O Llido

Abstract

Background & aims: To improve hospital health care delivery by identifying malnutrition in all admitted patients and following up those identified to be malnourished and “at risk of developing malnutrition” a hospital nutrition support program based on the JCAHO system was initiated in 1999. Two major problems were encountered: first, the inability to perform a nutrition surveillance process due to failure by the staff to implement existing nutrition screening tools and second, the lack of awareness and support from the medical staff in this initiative. Two solutions were implemented in 2000: computerization of the nutrition screening and nutrition support process and synchronizing this with the whole nutrition support program. Methods: A computer program was developed which performs BMI-based nutrition screening, produces lists of all malnourished patients, and computes the different formulas for either nutritional requirement or parenteral and/or enteral formulation. It also generates patient status reports based on encoded data from the nutrition support team, which prioritized these patients for management based on the data output. Results: From 2000 to 2003, improvement was seen in these areas: entry of height and weight in the patient record increased from 30% to 90%; nutrition surveillance shows nutritional status distribution to be: normal (58%), underweight (9%), overweight (25%), and obese (8%), referrals to the nutrition support team based on the screen notification increased from 37% to 100%, patient coverage by nutrition support services increased from 7374 (38.8%) in 2000 to 11,369 (83%) in 2003, and critical care patients seen increased from 10% in 2000 to 99% in 2003. More improvement is needed in physician response to nutrition support recommendations, which still remains low (11.2–24%).

Conclusions: Computerization helps to improve nutrition support delivery in the hospital, but more cooperation and support from the medical staff is still needed for better results.
Computerized energy balance and complications in critically ill patients: An observational study

D Divir, J Cohen and P Singer

Abstract

Background & aims: An accurate energy balance is difficult to achieve in hospitalized patients. The aim of the study was to measure the daily cumulative energy balance in critically ill patients receiving mechanical ventilation using a bedside computerized information system (CIS), and to assess its impact on outcome.

Methods: Fifty intensive care unit (ICU) patients (33 male, 17 female, mean age 59±18 years) were prospectively followed. Mean body mass index was 26.85±5.23 kg/m² and mean APACHE II score, 23.1±7.7. Resting energy expenditure was measured daily with indirect calorimetry (Deltatrac II, Datex-Ohmeda, Finland), and daily macronutrient intake was measured with a bedside CIS (iMDsoft, Israel) connected to all caloric sources. End-point measures were morbidity (acquired organ dysfunction, pressure sores, need for surgery) and mortality. One- and two-way analysis of variance and stepwise logistic regression for predicted probability were used for statistical analysis.

Results: Mean energy intake was 1512 kcal/day and mean cumulative energy balance for an overall ICU stay of 566 days was -4767 kcal (range +4747 to -17,274). A strong association of maximum negative energy balance with adult respiratory distress syndrome (P=0.0003), sepsis (P=0.0035), renal failure (P=0.0001), pressure sores (P=0.013), need for surgery (P=0.023), and total complication rate (P=0.0001), but not with length of ventilation, ICU stay, or hospitalization, or mortality.

Conclusions: Negative energy balance may be correlated with the occurrence of complications in the ICU. The bedside CIS provides accurate information on energy balance in critically ill patients and may allow for early detection and prevention of severe negative energy balance and complications.

Enteral nutrition delivery and energy expenditure in medical intensive care patients

S Petros and L Engelmann

Abstract

Background & aims: Delivery of enteral nutrition (EN) in critical illness is often inadequate. This prospective observational study addresses the implementation of enteral feeding in critically ill medical patients and its relation to energy expenditure.

Methods: All admissions to a university medical ICU over a period of one year were screened. Patients receiving EN for at least 7 days were followed up. The caloric target was a minimum of 20 kcal/kg/day. The feeding volume was increased daily by 500 ml and a maximum of 2000 ml/day was targeted to be achieved by day 4 of admission. Energy expenditure was measured with indirect calorimetry on day 3 or 5.

Results: Two hundred and thirtyone patients required artificial nutrition, of which 61 patients were enterally fed for >=7 days. This group was followed for a total of 750 feeding days. The gastric route was used at the start, with a post-pyloric feeding required during follow-up in 36.1% of patients due to high gastric residual. EN was interrupted in 32.1% of the feeding days. The daily administered volume was 86.2±30.4% of the prescribed. The mean enteral caloric supply in relation to energy expenditure was between 39.2±34.6% on day 1 and 83.1±31.1% on day 6. The targeted maximum feed volume was achieved on day 4 in 75.4% of the patients. Patients with a delayed target time had a higher mortality rate than those with a target time of <4 days (73.3% vs. 26.1%).

Conclusions: A high delivery-to-prescription rate could be achieved with a standardized enteral feeding protocol in critically ill medical patients. However, caloric delivery is much less than measured energy expenditure. Enteral feeding intolerance is associated with a high mortality rate.
Frequency of under- and overfeeding in mechanically ventilated ICU patients: causes and possible consequences

C Reid

Abstract

Introduction: In critically ill patients enteral nutrition (EN) is frequently associated with underfeeding and intolerance, whilst parenteral nutrition (PN) has been associated with a greater risk of infectious complications and overfeeding. Materials and methods: The adequacy of nutritional support provided to critically ill patients was prospectively recorded and compared with estimated requirements. The incidence of, and practices contributing to, underfeeding (<80% of energy requirements) and overfeeding (>110% of energy requirements) were identified. Results: Overall patients received approximately 81% and 76% of prescribed energy and protein intakes respectively. Underfeeding occurred on 50.3% of days. Reasons for patients failing to achieve adequate intakes included, fasting for airway management procedures (21%) and gastrointestinal intolerance (14%). Overfeeding, although less common (18.6% of days), was more likely to occur in patients with a tracheostomy requiring prolonged mechanical ventilation (>16 days). The combination of oral and nasogastric feeding or use of nutrient-dense feeds were most frequently associated with overfeeding. Discussion: The overall adequacy of nutritional intakes in the present study was similar to those reported elsewhere. However, the incidence of overfeeding was greater than anticipated and occurred in patients already experiencing delayed weaning from mechanical ventilation.

Enteral access for nutrition in the intensive care unit.

D Haslam and J Fang

Abstract

Purpose of review: Enteral nutrition is the preferred route for nutrition support in the intensive care unit setting. This is usually delivered through nasoenteric feeding tubes in patients with an otherwise functional gastrointestinal tract. Placement of nasoenteric feeding tubes, however, may be difficult in this setting. Nasoenteric feeding tubes may be placed by multiple methods, each with their particular advantages and disadvantages. This review summarizes the recent literature on different methods of nasoenteric feeding tube placement with emphasis on critically ill patients. Recent findings: Bedside assisted methods using electromyogram, electrocardiogram, and magnetic fields to provide immediate positional feedback to help guide tube advancement appear promising. Bedside methods using specific protocols, modified feeding tubes, prokinetics or magnetic assistance were also successfully reported. None of these methods has been prospectively compared with more commonly practiced methods in large studies. Endoscopic nasoenteric tube placement methods including transnasal approaches using ultra-thin endoscopes have been recently described and appear to be equivalent to fluoroscopic placement. All these recently reported techniques, however, may require more specialized equipment or training than is currently widely available. Summary: Feeding tubes can be placed using bedside, fluoroscopic, and endoscopic means. Novel bedside methods have been recently described using immediate positional feedback or new assistive methods. Endoscopic techniques have similar success rates to fluoroscopic techniques and provide data on upper gastrointestinal abnormalities. There is no clear universal standard method. When feeding tube placement is required the technique used depends on local institutional resources and expertise.
Evaluation of a technique for blind placement of post-pyloric feeding tubes in intensive care: application in patients with gastric ileus

A J Lee, R Eve and M J Bennett


Abstract

Objective: To evaluate a blind ‘active’ technique for the bedside placement of post-pyloric enteral feeding tubes in a critically ill population with proven gastric ileus.

Design and setting: An open study to evaluate the success rate and duration of the technique in cardiothoracic and general intensive care units of a tertiary referral hospital. Patients: 20 consecutive, ventilated patients requiring enteral nutrition, where feeding had failed via the gastric route.

Interventions: Previously described insertion technique—the Corpak 10-10-10 protocol—for post-pyloric enteral feeding tube placement, modified after 20 min if placement had not been achieved, by insufflation of air to promote pyloric opening.

Measurements and results: A standard protocol and a set method to identify final tube position were used in each case. In 90% (18/20) of cases tubes were placed on the first attempt, with an additional tube being successfully placed on the second attempt. The median time for tube placement was 18 min (range 3-55 min). In 20% (4/20) insufflation of air was required to aid trans-pyloric passage.

Conclusions: The previously described technique, modified by insufflation of air into the stomach in prolonged attempts to achieve trans-pyloric passage, proved to be an effective and cost efficient method to place post-pyloric enteral feeding tubes. This technique, even in the presence of gastric ileus, could be incorporated by all critical care facilities, without the need for any additional equipment or costs. This approach avoids the costs of additional equipment, time-delays and necessity to transfer the patient from the ICU for the more traditional techniques of endoscopy and radiographic screening.

Tracheobronchial aspiration of gastric contents in critically ill tube-fed patients: Frequency, outcomes, and risk factors.

N A Metheny, R E Clouse, Y-H Chang, B J Stewart, D A Oliver, M H Kollef


Abstract

Objectives: To describe the frequency of pepsin-positive tracheal secretions (a proxy for the aspiration of gastric contents), outcomes associated with aspiration (including a positive Clinical Pulmonary Infection Score [a proxy for pneumonia] and use of hospital resources), and risk factors associated with aspiration and pneumonia in a population of critically ill tube-fed patients.

Design: Prospective descriptive study conducted over a 2-yr period. Setting: Five intensive care units in a university-affiliated medical center with level 1 trauma status. Patients: Each of the 360 adult patients participated for 4 days. Among the inclusion criteria were mechanical ventilation and tube feedings. An exclusion criterion was physician-diagnosed pneumonia at the time of enrollment. Intervention: None. Measurements and Major Results: Almost 6,000 tracheal secretions collected during routine suctioning were assayed for pepsin; of these, 31.3% were positive. At least one aspiration event was identified in 88.9% (n = 320) of the participants. The incidence of pneumonia (as determined by the Clinical Pulmonary Infection Score) increased from 24% on day 1 to 48% on day 4. Patients with pneumonia on day 4 had a significantly higher percentage of pepsin-positive tracheal secretions than did those without pneumonia (42.2% vs. 21.1%, respectively; p < .001). Length of stay in the intensive care unit and need for ventilator support were significantly greater for patients with pneumonia (p < .01). A low backrest elevation was a risk factor for aspiration (p = .024) and pneumonia (p = .018). Other risk factors for aspiration included vomiting (p = .007), gastric feedings (p = .009), a Glasgow Coma Scale score <9 (p = .021), and gastroesophageal reflux disease (p = .033). The most significant independent risk factors for pneumonia were aspiration (p < .001), use of paralytic agents (p = .002), and a high sedation level (p = .039).

Conclusions: Aspiration of gastric contents is common in critically ill tube-fed patients and is a major risk factor for pneumonia. Furthermore, it leads to greater use of hospital resources. Modifiable risk factors for aspiration need to be addressed.
Energy Expenditure in Children With Severe Head Injury: Lack of Agreement Between Measured and Estimated Energy Expenditure

S Havalad, M A Quaid, and V Sapiega

Abstract

Background: The purpose of this study was to test the hypotheses that estimates of resting energy expenditure (REE) vary significantly from measured energy expenditure in a population of head-injured children and are not accurate for use in determining nutrition needs in this population. Methods: This is a retrospective study of 30 children with severe head injury, with Glasgow Coma Scale (GCS) score of <8 and needing mechanical ventilation. Measured REE was obtained using indirect calorimetry. Estimated REEs were calculated using Harris-Benedict, World Health Organization (WHO), Schofield, and White formulas. Severity of illness was calculated using Pediatric Risk of Mortality (PRISM) score. Agreement between measured REE and estimated REE was tested using the Bland-Altman method. Correlation coefficient between PRISM score and measured REE was calculated using Spearman test. Results: More than half of the estimates of REE differed from measured REE by >10%. Significant disagreement between estimated REE and measured REE was demonstrated using the Bland-Altman method. There was no correlation between severity of illness and measured REE to explain the inaccuracies of REE estimates. Conclusion: Energy expenditure in critically ill children cannot be estimated accurately; hence, nutrition for critically ill children with head injury should be provided according to measurement of REE to avoid the consequences of overfeeding or malnutrition.

Nutrition Support Teams: An Evidence-Based Practice

P J Schneider

Abstract

With the development of specialized nutrition support, an interdisciplinary approach was essential to translating this medical breakthrough from the laboratory to the bedside. As this new innovation was adopted, interdisciplinary nutrition support teams were created to optimize the effectiveness and safety of this therapy. The impact of standardization and the use of an interdisciplinary team to provide specialized nutrition support have been shown to improve outcomes and safety and to have a positive financial impact on healthcare institutions. Yet many hospitals do not have nutrition support teams, and the numbers that do may have decreased. To be effective, nutrition support teams need to practice at an evidence-based level and measure their performance. Nutrition support teams include many of the components of the healthcare delivery system that are advocated for the future, and nutrition support teams should be encouraged as the preferred system of providing specialized nutrition support.
Acute Complications Associated with Bedside Placement of Feeding Tubes

W N Baskin

Abstract
Several types of feeding tubes can be placed at a patient's bedside; examples include nasogastric, nasointestinal, gastrostomy, and jejunostomy tubes. Nasoenteral tubes can be placed blindly at bedside or with the assistance of placement devices. Nasoenteric tubes can also be placed via fluoroscopy and endoscopy. Gastrostomy and jejunostomy tubes can be placed using endoscopic techniques. This paper will describe the indications and contraindications for different types of tubes that can be placed at the bedside and complications associated with tube placement.

Complications associated with nasoenteral tubes include inadvertent malpositioning of the tube, epistaxis, sinusitis, inadvertent tube removal, tube clogging, tube-feeding-associated diarrhea, and aspiration pneumonia. Complications from percutaneous gastrostomy and jejunostomy tube placements include procedure-related mishaps, site infection, leakage, buried bumper syndrome, tube malfunction, and inadvertent removal. These complications will be reviewed, along with a discussion of incidence, cause, treatment, and prevention approaches.

Nasointestinal intubation with tiger tubes: a case series indicates risk of mucosal damage

S J Taylor, A Pullyblank, A Manara

Abstract
In five intubations using the tiger tube (Cook) two were successfully placed into the small intestine. Two of the three intubation failures were due to early death due to the underlying condition. Nasointestinal placement permitted successful enteral feeding. Unfortunately, both nasointestinal placements were associated with mucosal damage that appears to be related to the tube “flaps”. The tiger tube facilitates nasointestinal tube placement but until concerns regarding safety are addressed its clinical use cannot be recommended.
Analysis of patients’ rights: dementia and PEG insertion

C Dennehy

Abstract
The decision to provide or withhold artificial feeding in patients with advanced dementia presents a multifaceted ethical dilemma. This article analyses the issues of rights regarding such patients and explores the ethical principles of beneficence, non-maleficence, respect'autonomy, justice and veracity. Evidence points strongly to hand-feeding being the method of choice for these patients (Finucane et al, 1999; Li, 2002). However, for each case there is no right or wrong answer and the physical and psychological wellbeing of the individual patient must be taken into account.

Energy Expenditure in Patients With Nontraumatic Intracranial Hemorrhage

D H Esper, W M Coplin and J R Carhuapoma

Abstract

Background: Patients with intracerebral (ICH), intraventricular (IVH) and subarachnoid hemorrhage (SAH) have increased morbidity and mortality compared with other forms of stroke. We postulate that the systemic inflammatory state triggered by these forms of nontraumatic intracranial hemorrhage (IH) translates into higher nutrition requirements than traditionally assumed. In order to test this hypothesis, we performed a retrospective study comparing the resting energy expenditure (REE) of 14 mechanically ventilated IH patients with the REE of 6 severe traumatic brain injury (sTBI) patients (a disease known to induce an increased metabolic state). Methods: Using nonparametric analysis, we compared 2 contemporary cohorts of patients—IH and sTBI—who required mechanical ventilation and who underwent indirect calorimetry (IC) within 7 days after the ictus. Results: Fourteen patients with nontraumatic IH (IVH, 2; SAH, 9; SAH/ICH, 1; ICH/SAH/IVH, 2) who underwent IC within 7 days from injury were identified; median age: 59 (28–84) years, median admission Glasgow Coma Scale (GCS): 6 (4–9), and median APACHE II: 19.5 (15–28). A control cohort of 6 patients with sTBI was identified; median age: 57.5 (18–80) years, admission GCS: 6.5 (4–8), and APACHE II: 16 (11–31). Sedation was used in 11/14 patients with IH and in 5/6 severe TBI patients. No patient was pharmacologically paralyzed. Median REE was 1810 (1124–2806) and 2238 (1860–2780) kcal/d for the IH and for the sTBI patient cohorts, respectively. Using Wilcoxon signed ranks test, the 2 patient groups were found comparable in regard to baseline clinical variables and disease severity (APACHE II). We did not identify a statistically significant difference in the REE between these 2 cohorts of patients (p = .25). Conclusions: Patients with severe TBI and patients with IH have similar increments in metabolic rate during the initial phase (1 week from onset) of their disease. This information needs to be confirmed in a larger cohort of patients. If reproduced, our results suggest that nontraumatic IH patients are at high risk of inadequate nutrition if their metabolic rate is estimated after conventional nutrition practice.
Nutrition Support in Acute Pancreatitis: A Systematic Review of the Literature

S A McClave, W-K Chang, R Dhaliwal, and D K Heyland

Abstract

Background: Failure to use the gastrointestinal (GI) tract in patients with acute pancreatitis may exacerbate the stress response and disease severity, leading to greater incidence of complications and prolonged hospitalization. The objectives of this study were to determine the optimum route for nutrition support, whether nutrition therapy is better than no artificial nutrition support, whether specific additives to enteral or parenteral therapy can further enhance their efficacy, and whether methodologic differences in delivery of enteral nutrition (EN) influence tolerance.

Methods: A computerized search was performed of MEDLINE, Cochrane database, EMBASE, and reference lists of pertinent review articles for prospective randomized trials in adult patients with acute pancreatitis that evaluated interventions with nutrition therapy. Primary outcome data and surrogate endpoint parameters (for nutrition indices, stress markers, and measures of the inflammatory/immune response) were extracted in duplicate independently. Where appropriate, meta-analysis was performed by random-effects model.

Results: From 119 articles screened, 27 randomized controlled trials were included and analyzed. In patients admitted for acute pancreatitis, meta-analysis of 7 trials showed that use of EN was associated with a significant reduction in infectious morbidity (risk ratio \(RR = 0.46\); 95% confidence interval \([CI], 0.29 – 0.74\); \(p = .001\)) and hospital length of stay (LOS; weighted mean difference \([WMD] = –3.94\); 95% CI, –5.86 to –2.02; \(p < .0001\)), a trend toward reduced organ failure \((RR = 0.59); 95% CI, 0.28–1.27; p = .18\), with no effect on mortality \((RR = 0.88); 95% CI, 0.43–1.79; p = .72\) when compared with use of parenteral nutrition (PN). Results from individual studies suggest that EN in comparison to PN reduces oxidative stress, hastens resolution of the disease process, and costs less. Insufficient data exist to determine whether EN improves outcome over standard therapy (no artificial nutrition support) in patients admitted for acute pancreatitis. However, in those patients requiring surgery for complications of acute pancreatitis, meta-analysis of 2 trials indicates that provision of EN postoperatively may reduce mortality \((RR = 0.26); 95% CI, 0.06 – 1.09; p = .06\) compared with standard therapy. PN provided early within 24 hours of admission was shown to worsen outcome, whereas PN provided later after full-volume resuscitation appeared to improve outcome when compared with standard therapy. In early individual studies, specific supplements added to EN, such as arginine, glutamine, \(\omega-3\) polyunsaturated fatty acids, and probiotics, may be associated with a positive impact on patient outcome in acute pancreatitis, compared with EN alone without the supplements, but studies are too few to make strong treatment recommendations.

Supplementation of PN with parenteral glutamine was shown to reduce oxidative stress and improve patient outcome (reduced duration of nutrition therapy and decreased hospital LOS) compared with PN alone in patients with acute pancreatitis. A wide range of tolerance to EN exists, irrespective of known influences such as mode (continuous vs bolus) and level of infusion within the GI tract (gastric vs postpyloric).

Conclusions: Patients with acute severe pancreatitis should begin EN early because such therapy modulates the stress response, promotes more rapid resolution of the disease process, and results in better outcome. In this sense, EN is the preferred route and has eclipsed PN as the new “gold standard” of nutrition therapy. When PN is used, it should be initiated after 5 days. The favorable effect of both EN and PN on patient outcome may be further enhanced by supplementation with modulators of inflammation and systemic immunity. Individual variability allows for a wide range of tolerance to EN, even in severe pancreatitis.
Home enteral feeding audit 1 year post-initiation

S Evans, C Holden and A MacDonald

Abstract

Objective: To determine the practical problems that families of children on home enteral tube feeds (HETF) experience in the first year post-hospital discharge.

Methods: Thirty parents/carers of children (0–16 years) completed a multiple choice/short answer questionnaire by interview 12 months after discharge from hospital. Issues addressed included: home delivery of feed and equipment; pump usage; tube changes; and overnight feeding. Results: The main problems identified were: sleep disturbance (75%); frequent tube dislodgement (46%); tube blockages (41%); inability of some home delivery companies (HDC) to provide all the paediatric special feeds required (43%); and pump inaccuracy (23%). Conclusions: Children on long-term HETF and their families experience significant problems with sleep disturbance, tube dislodgement and tube blockage. In addition, accuracy of pumps and obtaining feed and equipment was a source of stress. Dietitians and community nurses urgently need to explore solutions to the common problems associated with overnight feeding. Furthermore, regular home reviews are necessary in long-term HETF to continue to identify and minimize problems.

Treatment of active Crohn’s disease in children using partial enteral nutrition with liquid formula: a randomised controlled trial

T Johnson, S Macdonald, S M Hill, A Thomas and M S Murphy

Abstract

Background and aims: Total enteral nutrition (TEN) with a liquid formula can suppress gut inflammation and induce remission in active Crohn’s disease. The mechanism is obscure. Studies have suggested that long term nutritional supplementation with a liquid formula (partial enteral nutrition (PEN)) may also suppress inflammation and prevent relapse. The aim of this study was to compare PEN with conventional TEN in active Crohn’s disease. Patients and methods: Fifty children with a paediatric Crohn’s disease activity index (PCDAI) >20 were randomly assigned to receive 50% (PEN) or 100% (TEN) of their energy requirement as elemental formula for six weeks. The PEN group was encouraged to eat an unrestricted diet while those receiving TEN were not allowed to eat. The primary outcome was achievement of remission (PCDAI <10). Secondary analyses of changes in erythrocyte sedimentation rate (ESR), C reactive protein, albumin, and platelets were performed to look for evidence of anti-inflammatory effects. Results: Remission rate with PEN was lower than with TEN (15% v 42%; p = 0.035). Although PCDAI fell in both groups (p = 0.001 for both), the reduction was greater with TEN (p = 0.005). Moreover, the fall in PCDAI with PEN was due to symptomatic and nutritional benefits. With both treatments there were significant improvements in relation to abdominal pain, “sense of wellbeing”, and nutritional status. However, only TEN led to a reduction in diarrhoea (p = 0.02), an increase in haemoglobin and albumin, and a fall in platelets and ESR. Conclusions: TEN suppresses inflammation in active Crohn’s disease but PEN does not. This suggests that long term nutritional supplementation, although beneficial to some patients, is unlikely to suppress inflammation and so prevent disease relapse.
Is supplementation with elemental diet feasible in patients undergoing pelvic radiotherapy?

C McGough, C Baldwin, A Norman, G Frost, P Blake, D Tait, V Khoo, K Harrington and H J N Andreyev


Abstract

Background: Acute gastrointestinal upset occurs in approximately 80% of patients undergoing radiotherapy for pelvic cancers. Underlying changes relate to denudation of the mucosal layer which renders the small intestine vulnerable to additional damage from proteolytic enzymes and bile acids. Severe acute bowel symptoms may predispose to progressive fibrotic and ischaemic changes. Elemental diet given during treatment may reduce acute and chronic bowel symptoms induced by pelvic radiotherapy.

Methods: This study aimed to assess compliance with elemental diet during pelvic radiotherapy. Patients with gynaecological, urological or rectal malignancy undergoing radical or adjuvant pelvic radiotherapy were randomised to one of five groups. Each group was assigned a target quantity of three different elemental sip feeds (Group 1, 20%, Group 2, 50%, Group 3, 75% of calorie requirements taken as E028 extra liquid; Group 4, 50% of calorie requirements taken as E028 extra powder; Group 5, 50% of calorie requirements taken as Emsogen powder). Compliance was assessed using a diary card and weekly assessment.

Results: Fifty patients (44 female, six male) mean age 58 yr (95% CI 55–61), were recruited to the study (24 endometrial, 17 cervical, 7 rectal, 1 vulval and 1 bladder carcinoma). Mean weight at baseline was 74.5 kg (95% CI 69–80) and this did not change during treatment. Full compliance was achieved in three patients, all from Group 1. By week 5, only 46% of patients were consuming elemental diet. Post hoc analysis of variance with repeated measures indicated that there were no significant differences in volume of elemental diet consumed between groups (P=0.937). There was a significant inverse linear relationship between intake of elemental diet and time (P<0.001).

Conclusions: Different formulations of elemental diet do not influence compliance. Patients are unlikely to be able to consume more than one-third of their calorie requirements in the form of an elemental sip feed. Further investigation is warranted to determine if intervention with this volume of elemental diet is beneficial.

The key role of micronutrients

A Shenkin


Summary: Micronutrients play a central role in metabolism and in the maintenance of tissue function, but effects in preventing or treating disease which is not due to micronutrient deficiency cannot be expected from increasing the intake. There is a highly integrated system to control the flux of micronutrients in illness, and this demonstrates just how important the body perceives the micronutrients to be. An adequate intake therefore is necessary to sustain metabolism and tissue function, but provision of excess supplements to individuals who do not need them may be harmful. Clinical benefit is most likely in those individuals who are severely depleted and at risk of complications, and is unlikely if this is not the case. Much more research is needed to characterise better markers of micronutrient status both in terms of metabolic effects and antioxidant effects, so that at-risk patients can be identified and supplementation modified accordingly. Large-scale trials of different doses of micronutrients are required with precise outcome markers to optimise intakes in different groups of patients as well as in the general population.
Safety of an Immune-Enhancing Nutrition Supplement in Cirrhotic Patients With History of Encephalopathy

S G Abou-Assi, A A Mihas, E A Gavis, R N HoChong, S Gilles, A Haselbush, J R Levy, A Habib and D M Heuman


Abstract

Malnutrition in advanced cirrhosis may worsen liver function and increase susceptibility to infections. Immune-enhancing nutrition supplements (IENS) may be of value, but their safety in patients with decompensated cirrhosis and history of encephalopathy is unknown. We assessed the safety of Impact Recover (Novartis, St. Louis Park, MN), an orally palatable IENS, in 12 men with hepatic cirrhosis of Child-Turcotte-Pugh (CTP) class B or C, ages 40–60. On day 0, patients were evaluated serially for 6 hours after ingestion of 2 packets of Impact Recover. Despite a transient doubling of the blood ammonia, no cognitive abnormalities were noted on clinical assessment or psychometric testing. Subsequently, patients were instructed to ingest 3 packets per day of Impact Recover for 56 days, after which supplements were stopped. Patients were evaluated in a fasting state on days 0 (baseline), 56 (end of treatment), and 112 (follow-up). One patient was transplanted on day 21, and another died after an urgent cholecystectomy on day 30. The remaining 10 patients completed the study. Mean value of CTP score was 9 (range, 7–11) and mean value of model for end-stage liver disease (MELD) score was 14 (7–21), and there was no change after 8 weeks of IENS. Only 1 experienced transient worsening of encephalopathy after omitting lactulose. Performances on psychometric tests did not change. Transferrin levels increased rapidly with IENS, then returned toward baseline after IENS was stopped. Fasting insulin and peptide YY (PYY) levels also increased, but fasting glucose and hemoglobin A1C did not change. Trends in other nutrition and immune parameters did not reach significance. We conclude that acute and chronic administration of Impact Recover was well tolerated in cirrhotic patients with controlled encephalopathy. Further studies are justified to assess potential efficacy of long-term IENS in preventing infection and slowing progression in advanced cirrhosis.

Benefit of an enteral diet enriched with eicosapentaenoic acid and gamma-linolenic acid in ventilated patients with acute lung injury.

P Singer; M Thiella, H Fisher, L Gibstein, E Grozovski and J Cohen


Abstract

Objective: To explore the effects of an enteral diet enriched with eicosapentaenoic acid (EPA), gamma-linolenic acid (GLA), and antioxidants on the respiratory profile and outcome of patients with acute lung injury. Design: Single-center, prospective, randomized, controlled, unblinded study. Setting: General intensive care department of a tertiary-care, university-affiliated hospital. Patients: A total of 100 patients with acute lung injury, diagnosed according to the American-European Consensus Conference on ARDS. Interventions: Patients were randomized to receive the standard isonitrogenous, isocaloric enteral diet or the standard diet supplemented with EPA and GLA for 14 days. Measurements and Main Results: Patient demographics, Acute Physiology and Chronic Health Evaluation II score, and type of admission were noted at admission. Compared with baseline oxygenation (EPA + GLA group vs. control group), by days 4 and 7, patients receiving the EPA + GLA diet showed significant improvement in oxygenation (Pao2/Fio2, 317.3 +/- 99.5 vs. 214.3 +/- 56.4 and 296.5 +/- 79.8, respectively; p < .05). Compliance was significantly higher in the EPA + GLA group observed at day 7 (55.1 +/- 20.0 mL/mbar, p < .05). No significant difference was found in nutritional variables. Resting energy expenditure was significantly higher in patients in the EPA + GLA group, but their body mass index was also higher (p < .05). A significant difference was found in length of ventilation (p < .04) in favor of the EPA + GLA group. There was no between-group difference in survival. Conclusions: In patients with acute lung injury, a diet enriched with EPA + GLA may be beneficial for gas exchange, respiratory dynamics, and requirements for mechanical ventilation.
Application of subjective global assessment as a screening tool for malnutrition in surgical patients in Vietnam

N V Pham, P L M Cox-Reijven, J W Greve and P B Soeters

Abstract

Background and aims: In most hospitals in Vietnam, clinical assessment of nutritional status has yet to become part of the routine clinical history taking and physical examination. It is the aim of this study to apply subjective global assessment (SGA) of nutritional status in surgical patients in the Mekong Delta, Vietnam, to determine the incidence of malnutrition according to SGA and to know whether there was an association between SGA class and infectious complications.

Methods: A prospective, cross-sectional study design was used. SGA of nutritional status was applied. Patients were rated as well nourished (A), moderately malnourished (B) or severely malnourished (C). Infectious complications (wound infection, intra-abdominal abscesses, anastomotic leakage) were recorded.

Results: Of the 438 patients assessed, 194 (44.3%) were classified as A, 126 patients (28.8%) were classified as B and 118 patients (26.9%) were classified as C. Of the 274 patients who underwent major abdominal surgery assessed, 61 patients (22.3%) were classified as A, 97 patients (35.4%) were classified as B and 116 patients (42.3%) were classified as C. Weight loss and percent weight loss, muscle wasting, loss of subcutaneous fat, functional capacity and significant gastrointestinal symptoms correlate significantly with the severity of SGA class \( P<0.001 \). The rate of postoperative infectious complications was higher in patients classified as SGA class C (33.6%) than as class A (6%) and B (11%).

Conclusions: A high rate of malnutrition was found, applying SGA of nutritional state in surgical patients in Vietnam. Malnutrition was associated with an increase in infectious complications. Special attention should be paid to weight loss, muscle wasting, loss of subcutaneous fat, functional capacity and gastrointestinal symptoms.
Reference List

Useful References on Nutrition Support

  This article is a practice profile which is based on NS311 Best C (2005) Caring for the patient with a nasogastric tube. Nursing Standard 20 (3): 59-65 and discusses the different tests to decipher tube placement and experiences of some issues that the nurse has experienced.

  This article discusses the use of EPA in sip feeds in connection to cancer patients with associated cachexia in an advanced disease state. The patients targeted are individuals meeting energy requirements but still experiencing unexpected weight loss.

  This article discusses the use of protein rich supplements in patients with Cystic Fibrosis who were moderately malnourished, the supplements were in addition to usual dietary advice compared with dietary advice alone, over a 12 month period.

  This article discusses the new guidelines from NICE with reference to the recommendation that every hospital should have a nutrition nurse specialist and that all people admitted to hospital should be routinely screened for nutritional support.

  This article discusses the basis of a healthy diet for older people together with facts and figures on malnutrition, the digestive process and age related changes. It also discusses malnutrition tools and social and economic factors to poor diet.

  This article compares the effects of a multi-fibre enriched formula and fibre free formula on faecal short-chain fatty acids and microbiota in long term enteral nutrition patients.

  This article discusses the introduction of nutritional assessment in the medical school curriculum and assesses the knowledge of these students and the practice of this clinical skill in hospitalized medical patients.

  This article compares the computed nutrient requirements of geriatric patients under critical care with their actual intake within the first 3 days after admission.

  This research article discusses the measurement of energy expenditure of acutely ill patients in hospital and following discharge in the community.