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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
- Ageing Research Reviews
- 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
- Diabetes Care
- Gastrointestinal Nursing
- GUT
- Intensive Care Medicine
- International Journal of Palliative Care
- 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
- 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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Pre-pyloric Versus Post-pyloric Feeding

Jabbar A and McClave SA


Abstract

Optimal management of the critically ill patient involves the initiation and rapid advancement of early enteral nutrition (EN). Compared to parenteral nutrition or no nutritional support, early enteral feeding favourably impacts patient outcome by reducing infectious morbidity and shortening hospital length of stay. Controversy exists over the true risks and benefits of pre-pyloric versus post-pyloric feeding. Placement of nasogastric tubes is easier than nasojugal tubes, initiation of EN is more expedient, and intragastric feeds may provide greater physiologic benefits. Post-pyloric feeding, on the other hand, is associated with fewer interruptions once EN has been started, may reach goal calorie provision sooner, and may reduce risk for gastroesophageal reflux and aspiration. Overall differences in outcome between the two methods of feeding, however, are minimal. Thus, the final choice for the practicing clinician on the level of infusion of enteral feeding is based on institutional factors (related to protocols and available expertise) and the degree of risk and potential tolerance of the individual patient.

Effects of an Appropriate Oral Diet on the Nutritional Status of Patients with HCV-related Liver Cirrhosis: A Prospective Study

Manguso F, D’Ambra G, Menchise A, Sollazzo R and D’Agostino L


Abstract

Background & Aims: In patients with liver cirrhosis, protein-energy malnutrition is a frequent finding and a risk factor influencing survival. The aim was to estimate the effects of an adequate diet on malnutrition and clinical outcome in patients with Child A or B HCV-related liver cirrhosis. Methods: We enrolled 90 consecutive outpatients (M/F = 52/38) with liver cirrhosis, 30 in Child class A and 60 in class B. Patients were evaluated by anamnesis, clinical examination, estimation of daily caloric intake and measurement of anthropometrical and biochemical indexes. Patients were randomised into two groups: group 1 with a 3-month oral controlled diet started one week after the first examination and this was followed by a 3-month of spontaneous dietary intake, and group 2 which started a 3-month spontaneous dietary intake followed by a 3-month of controlled diet. The follow-up was performed every month. Results: During the period of controlled diet in patients of both groups, protein malnutrition assessed by midarm muscle circumference, creatinine-height index and serum albumin significantly improved independently of the Child class. Lipid malnutrition, assessed by triceps skin fold thickness values, did not improve during the course of the study. The compliance to the prescribed diet was very high in both groups, and no carry over effect of the previous dietary intake was observed during the follow-up period. Conclusions: The results emphasize the importance of both nutritional status evaluation and improvement in the Child A and B cirrhotic patients with HCV-related disease. The proposed nutritional approach was able to influence their protein malnutrition positively.
Negative Impact of Hypocaloric Feeding and Energy Balance on Clinical Outcome in ICU Patients

Villet S, Chiolero RL, Bollmann MD, Revelly J-P, Cayeux M-C RN, Delarue J and Berger MM

Abstract
Background and aims: Critically ill patients with complicated evolution are frequently hypermetabolic, catabolic, and at risk of underfeeding. The study aimed at assessing the relationship between energy balance and outcome in critically ill patients. Methods: Prospective observational study conducted in consecutive patients staying \( \geq 5 \) days in the surgical ICU of a University hospital. Demographic data, time to feeding, route, energy delivery, and outcome were recorded. Energy balance was calculated as energy delivery minus target. Data in means±SD, linear regressions between energy balance and outcome variables. Results: Forty eight patients aged 57±16 years were investigated; complete data are available in 669 days. Mechanical ventilation lasted 11±8 days, ICU stay 15±9 was days, and 30-days mortality was 38%. Time to feeding was 3.1±2.2 days. Enteral nutrition was the most frequent route with 433 days. Mean daily energy delivery was 1090±930 kcal. Combining enteral and parenteral nutrition achieved highest energy delivery. Cumulated energy balance was between -12,600±10,520 kcal, and correlated with complications (P<0.001), already after 1 week. Conclusion: Negative energy balances were correlated with increasing number of complications, particularly infections. Energy debt appears as a promising tool for nutritional follow-up, which should be further tested. Delaying initiation of nutritional support exposes the patients to energy deficits that cannot be compensated later on.

Effects of Hypercaloric Feeding on Nutrition Status and Carbon Dioxide Production in Patients With Long-Term Mechanical Ventilation

Lo H-C, Lin C-H and Tsai L-J

Abstract
Background: To clarify clinical arguments regarding nutrition support in patients with long-term mechanical ventilation, we investigated the effects of hypercaloric feeding on nutrition status and carbon dioxide production. Methods: Twenty-eight mechanically ventilated, clinically stable patients with nasogastric tube feeding were recruited and randomly divided into the control and hypercaloric groups, which were provided with 1.2- and 1.8-fold of resting energy expenditure (REE), respectively. The arterial and venous blood samples were collected, the anthropometric measurements were determined, the serum concentrations of nutrition-related proteins were measured, and the parameters on the ventilator and indirect calorimeter were recorded on weeks 0, 2, and 4. Results: There were no significant changes in anthropometric measurements, blood gas tensions, and REE between the control and hypercaloric groups during the experimental period (mixed model with repeated measures analysis, p < .05). After adjusted for values on week 0 and time, patients with hypercaloric feeding had significantly increased levels in white blood cells, haemoglobin, and haematocrit. However, the control group had significantly decreased and the hypercaloric group had significantly increased serum concentrations of prealbumin and transferrin, rate of carbon dioxide production, and respiratory quotient (RQ) from week 0 to week 4. Conclusion: Our results suggest that 4 weeks of hypercaloric feeding may significantly increase the production of carbon dioxide but may not significantly alter the clinical outcomes in patients with long-term mechanical ventilation. The adverse effects of hypercaloric feeding may easily be overlooked, and the appropriateness of nutrition support should be carefully monitored in patients with mechanical ventilation.
Does Nutritional Risk, As Assessed by Nutritional Risk Index, Increase During Hospital Stay? A Multinational Population-based Study

Kyle UG, Schneider SM, Pirlich M, Lochs H, Hebutterne X and Pichard C


Abstract

**Background:** Progressive nutritional depletion has been reported during hospital stay. This prospective study compared the proportion of nutritional risk at hospital admission in three European countries and further evaluated nutritional risk at late versus early phase of hospitalisation in one hospital. **Methods:** Nutritional risk was determined in Geneva, Switzerland (n=652), Berlin, Germany (n=621) and Nice, France (n=107) at hospital admission, and during hospital stay (0–100 d) in Nice (n=527) by the Nutritional Risk Index \( \text{NRI}=1.519\times \text{serum albumin} \) (g/l)+41.7×(present weight/usual weight). NRI score of >100: no risk (NR); 97.5–100: mild risk; 83.5–97.5: moderate risk (MR); ≤83.5: severe risk (SR). Logistic regressions were used to determine the odds ratios (OR) between MR or SR and length of hospital stay (LOS) ≥16 d compared to 1–15 d or nutritional assessment at 16–100 d compared to 1–15 d of hospitalisation. **Results:** Patients, assessed at hospital admission, who were hospitalised >16 d were more likely \( (P<0.001) \) to be at MR (OR 2.0, CI 1.4–3.0) or SR (OR 3.3, CI 1.7–6.2) than patients hospitalised 1–15 d. Nice patients assessed at 16–100 d were more likely \( (P<0.001) \) to be at MR (OR 5.4, CI 2.1–14.3) and SR (OR 14.7, CI 5.4–40.0) than patients assessed at 1–15 d of hospitalisation. **Conclusions:** The risk of MR or SR by NRI was greater in patients assessed during hospitalisation than in patients assessed at hospital admission, which suggests that patients evaluated later during hospitalisation are at greater risk than patients evaluated in the early phase of hospitalisation. Ongoing assessment during hospitalisation seems important to identify patients who are at increased risk for complications.

Older Hospitalised Patients at Risk of Malnutrition: Correlation with Quality of Life, Aid From the Social Welfare System and Length of Stay?

Brantervik ÅM, Jacobsson IE, Grimby A, Wallén TCE and Bosaeus IG


Abstract

**Background:** Malnutrition is regarded as a major risk factor for complications and delayed recovery in hospitalised elderly patients. **Objective:** To examine the prevalence of malnutrition in hospitalised elderly patients and evaluate simple clinical screening criteria. To investigate whether malnutrition was related to lack of care from the health care or social welfare system, quality of life and hospital length of stay (LOS). **Setting:** Non-acute geriatric hospital. **Subjects:** 294 elderly patients admitted for rehabilitation after acute hospital care; 244 patients were available for assessment. **Methods:** Questionnaire interview about nutrition, social network and quality of life. Anthropometric and biochemical measurements, assessment of physical and cognitive function, recording of LOS, discharge destination and diagnosis. **Results:** 126 patients (51.6%) were at risk of malnutrition using the criteria of body mass index <22kg/m² and/or weight loss ≥5% 6 months. Poor quality of life in women \( (P<0.04) \) and loss of the health of a spouse \( (P<0.02) \) correlated with weight loss. No differences were found in patients at risk regarding LOS, discharge destination, or aid from the social welfare system. **Conclusions:** This study confirms a high prevalence of malnutrition risk in hospitalised elderly patients. The health care and social welfare system appeared to be unaware of the problem. Poor quality of life in females and loss of the health of a spouse were related to malnutrition risk. The screening variables that were used appeared not to predict hospital length of stay or discharge destination.
Can We Use Mid Upper Arm Anthropometry to Detect Malnutrition in Medical Inpatients? A Validation Study

Burden ST, Stoppard E, Shaffer J, Makin A and Todd C


Abstract

Background and aims: Mid upper arm anthropometry (MUAA) is often used as a measure of nutritional status to detect changes in body composition. The aim of this study was to investigate the reliability and validity of MUAA including mid arm circumference (MAC) and triceps skin fold thickness (TSFT) to determine the usefulness in clinical practice. Method: We measured MUAA in 158 consecutive admissions along with subjective global assessment (SGA) and body mass index (BMI). Inter- and intra-rater reliability was evaluated in an additional 50 patients. Results: The sensitivity and specificity of MUAA <5th percentile was compared with SGA and BMI. MAC and TSFT had a low sensitivity and a high specificity with low positive predictive values when compared with criterion values which were BMI ≤18 and SGA-C. The intra-class correlation coefficient for inter- and intra-rater reliability for MAC were 0.98 (95% CI 0.96-0.98) and 0.99 (95% CI 0.98-0.99) respectively and for TSFT were 0.97 (95% CI 0.91-0.97) and 0.98 (95% CI 0.95-0.98) respectively. Conclusion: MUAA <5th percentile had a high specificity but low sensitivity when compared with indicators of malnutrition. Although MUAA could be reliably measured, it has poor validity and is thus unlikely to be a good predictor of clinical outcome. Percentiles based on healthy populations do not generalise well to the individuals seen in clinical practice.

Do pH and Temperature Play a Role in Gastrostomy Tube Deterioration?

Roorda AK, Rider DL, Rider JA and Conroy BF


Abstract

The effects of pH and temperature over time on percutaneous endoscopic gastrostomy (PEG) tube longevity were examined in an in vitro model. Two sets of tubes were obtained from 7 major US PEG manufacturers. Using scissors, each PEG tube was cut cross-sectionally 8 cm from the bumper end of the tube. Both qualitative (photographs) and quantitative (mass) measurements were taken at baseline. Median physiologic gastric acidity was approximated by completely submerging 1 set of each cut PEG tube in a 250-mL glass jar containing a 0.050-N (pH 1.3) solution of hydrochloric acid. As a control, another set of each PEG tube was completely submerged in a 250-mL glass jar containing a buffer solution of pH 6. Each jar was then submerged in the waterbath so that the water completely covered the tube but did not enter the jar. The waterbath was covered and maintained at a constant temperature of 37°C. Measurements taken at baseline were repeated at 168 days and again at 375 days. On qualitative examination, no dilations, brittleness, obstruction, nodularity, tears, loss of elasticity, color changes, tube fracturing, kinking, loss of resilience, or variation in external diameter was observed. Quantitative examination showed no change in mass. Tubes removed from the pH 1.3 solution appeared identical to the tubes removed from the pH 6 solution. In all cases, there were no apparent changes from baseline. These findings suggest that temperature and pH can be excluded as predominant factors in tube deterioration and lend further support to a microbial hypothesis of PEG tube deterioration.
Nutrition Management of Small Bowel Transplant Patients

Weseman RA and Gilroy R


Abstract

Nutrition therapy after small bowel or combined liver/small bowel transplantation is challenging. The objective is to restore enteral autonomy to a patient with a complex past surgical history and equally complex posttransplant immunosuppressive regimen in the context of a newly created surgical anatomy. Improved surgical techniques and immunosuppressive regimens have led to superior outcomes. Accompanying these advances is a range of nutrition issues that require specific management strategies. This review outlines the current clinical practice and decision making used to create individualised nutrition regimens for small bowel or combined liver/small bowel transplant recipients. Successful small bowel transplant outcomes require a coordinated effort from a transplant team to restore nutritional autonomy to transplant recipients and free them from parenteral nutrition.

Enteral Nutritional Support and Use of Diabetes-specific Formulas for Patients with Diabetes: A Systematic Review and Meta-analysis.


Diabetes Care (2005) 28(9): 2267-79

Abstract

Objective: The aim of this systematic review was to determine the benefits of nutritional support in patients with type 1 or type 2 diabetes. Research Design and Methods: Studies utilising an enteral nutritional support intervention (oral supplements or tube feeding) were identified using electronic databases and bibliography searches. Comparisons of interest were nutritional support versus routine care and standard versus diabetes-specific formulas (containing high proportions of monounsaturated fatty acids, fructose, and fibre). Outcomes of interest were measures of glycemia and lipid status, medication requirements, nutritional status, quality of life, complications, and mortality. Meta-analyses were performed where possible. Results: A total of 23 studies (comprising 784 patients) of oral supplements (16 studies) and tube feeding (7 studies) were included in the review, and the majority compared diabetes-specific with standard formulas. Compared with standard formulas, diabetes-specific formulas significantly reduced postprandial rise in blood glucose (by 1.03 mmol/l [95% CI 0.58-1.47]; six randomised controlled trials [RCTs]), peak blood glucose concentration (by 1.59 mmol/l [86-2.32]; two RCTs), and glucose area under curve (by 7.96 mmol.l(-1).min(-1) [2.25-13.66]; four RCTs, i.e., by 35%) with no significant effect on HDL, total cholesterol, or triglyceride concentrations. In addition, individual studies reported a reduced requirement for insulin (26-71% lower) and fewer complications with diabetes-specific compared with standard nutritional formulas. Conclusions: This systematic review shows that short- and long-term use of diabetes-specific formulas as oral supplements and tube feeds are associated with improved glycemic control compared with standard formulas. If such nutritional support is given long term, this may have implications for reducing chronic complications of diabetes, such as cardiovascular events.
Enteral Nutritional Support in Prevention and Treatment of Pressure Ulcers: A Systematic Review and Meta-analysis


Abstract

Background: There have been few systematic reviews and no meta-analyses of the clinical benefits of nutritional support in patients with, or at risk of developing, pressure ulcers. Therefore, this systematic review and meta-analysis was undertaken to address the impact of enteral nutritional support on pressure ulcer incidence and healing and a range of other clinically relevant outcome measures in this group. Methods: Fifteen studies (including eight randomised controlled trials (RCTs)) of oral nutritional supplements (ONS) or enteral tube feeding (ETF), identified using electronic databases (including Pub Med and Cochrane) and bibliography searches, were included in the systematic review. Outcomes including pressure ulcer incidence, pressure ulcer healing, quality of life, complications, mortality, anthropometry and dietary intake were recorded, with the aim of comparing nutritional support versus routine care (e.g. usual diet and pressure ulcer care) and nutritional formulas of different composition. Of these 15 studies, 5 RCTs comparing ONS (4 RCTs) and ETF (1 RCT) with routine care could be included in a meta-analysis of pressure ulcer incidence. Results: Meta-analysis showed that ONS (250–500 kcal, 2–26 weeks) were associated with a significantly lower incidence of pressure ulcer development in at-risk patients compared to routine care (odds ratio 0.75, 95% CI 0.62–0.89, 4 RCTs, n=1224, elderly, post-surgical, chronically hospitalised patients). Similar results were obtained when a combined meta-analysis of ONS (4 RCT) and ETF (1 RCT) trials was performed (OR 0.74, 95% CI 0.62–0.88, 5 RCTs, n=1325). Individual studies showed a trend towards improved healing of existing pressure ulcers with disease-specific (including high protein) versus standard formulas, although robust RCTs are required to confirm this. Although some studies indicate that total nutritional intake is improved, data on other outcome measures (quality of life) are lacking. Conclusions: This systematic review shows enteral nutritional support, particularly high protein ONS, can significantly reduce the risk of developing pressure ulcers (by 25%). Although studies suggest ONS and ETF may improve healing of PU, further research to confirm this trend is required.
Use of Oral Nutritional Supplements in Patients with Huntington’s Disease

Trejo A, Boll M-C, Alonso ME, Ochoa A and Velásquez L

Nutrition (2005) 21(9): 889-894

Abstract

**Objective:** This study assessed the effect of oral nutritional supplements on the nutritional status of patients with Huntington’s disease. **Methods:** This was an experimental, longitudinal, prospective study of 30 patients with Huntington's disease. We performed neurologic evaluation and dietary assessment and measured anthropometric indexes and biochemical indicators; in addition, patients were questioned about their weight, appetite, chewing difficulty, and dysphagia. Patients consumed two cans daily of a nutritional supplement that contributed an extra 473 kcal to their diet for a 90-d period. At the study's end, the supplement was suspended and the same variables were reassessed.

**Results:** After 90 d, 68.7% of patients had increased body weight, 68.7% had ideal body weight percentages and body mass indexes, 53.3% had increased midarm circumferences, and 60.0% had increased arm muscle circumferences and body fat percentages; these changes were statistically significant (P < 0.05). The neurologic evaluation subscales and the biochemical indicators did not change significantly. With regard to subjective variables, patients who reported losing weight during the 3 months before the study did not lose more weight and patients who reported having an increased appetite before the study remained stable during the study.

**Conclusions:** The nutritional intervention stabilised or slightly improved the anthropometric variables assessed; however, no significant change in body mass index occurred in 87% of patients. For the purpose of maintaining an acceptable nutritional status in patients who have Huntington’s disease and normal nutritional status, we suggest oral nutritional supplements that contribute an average of 473 kcal/d in addition to a normal diet.

Nutrition in Liver Disease

Cabre E and Gassull MA


Abstract

**Purpose of review:** The aim of this paper is to describe the relevant medical literature published between spring 2003 and spring 2005 in the field of malnutrition in liver disease and its management. **Recent findings:** The most relevant articles covered in this paper provide data regarding the absence of energy imbalance in patients with stable cirrhosis, thus arguing against its potential role in the development of malnutrition; the increase in body cell mass and muscle mass as the major components of weight gain after portal-systemic shunting; the largest published randomised controlled trial of the positive effect of branched-chain amino acid supplements on the long-term outcome of patients with cirrhosis; studies using stable isotope labelled substrates, suggesting that dietary fat could be absorbed via the portal vein in patients with cirrhosis; and a randomised controlled trial suggesting the possibility that probiotics may decrease the infection rate after liver transplantation. **Summary:** In spite of the data provided by these and other articles described in the review, the major controversial issues in the field of nutritional management of liver disease remain open. Particularly remarkable is the lack of consensus regarding the nutritional management of acute liver failure.
Measurement of Net Acid Excretion by Use of Paper Strips

Whiting SJ and Muirhead JAB
Nutrition (2005) 21(9): 961-963

Abstract

Objective: Net endogenous acid production, reflected in the steady state as net acid excretion (NAE), is implicated in bone loss because it is positively associated with urinary calcium loss. Protein is one of the main sources of dietary acid load, whereas fruit and vegetables provide alkaline potassium salts that counteract the dietary acid load. This study investigated whether a pH paper strip measurement of overnight (i.e., first void) urine would reflect 24-h NAE, measured as excretion rates of titratable acid minus bicarbonate. Methods: Twenty-three subjects collected 24-h urine in two parts: day (~7 am to 11 pm) and overnight (~11 pm to 7 am). At first void, subjects recorded pH using paper strips. Subjects recorded intake and 20 subjects provided fasting urine collected from 7 to 9 AM. Results: The pH paper strip measurements of first void urine was significantly correlated with 24-h titratable acid minus bicarbonate ($r = -0.466, P < 0.025$) but not with 24-h NAE. We examined the association of dietary protein, potassium, protein:potassium ratio, and sodium with NAE, with fasting morning urinary calcium excretion, an indirect measurement of bone loss, and with urinary cross-links, a direct measurement of bone resorption. Of these, only sodium intake (measured as 24-h urine excretion) and urine potassium:sodium ratio showed a significant relation (with fasting calcium excretion). Conclusions: We did not find that the first void urine pH by paper strip measurement provided an index of daily net endogenous acid production as reflected in 24-h NAE. In our sample of young adults, daily sodium intake positively correlated with bone resorption, whereas daily NAE did not.

A Study to Investigate Women’s Experiences of Radiation Enteritis Following Radiotherapy for Cervical Cancer

Abayomi J, Kirwan J, Hackett A and Bagnall G

Abstract

Background: Radiotherapy remains the standard treatment for cervical cancer, especially for more advanced disease. It is estimated that the prevalence of chronic radiation enteritis (CRE) post-radiotherapy is in the region of 5-15% (http://www.nci.nih.gov/cancertopics). However, preliminary studies at the study hospital suggest the problem to be more widespread (C. Israel, unpublished data). Aim: This qualitative study of 10 cervical cancer patients investigates experiences of CRE and its impact on quality of life. Methods: Informed volunteers participated in one-to-one tape-recorded in-depth interviews exploring experiences following treatment. These interviews were transcribed verbatim and analysed using NUD*IST Nvivo. Results: The majority of women reported side-effects from radiotherapy, predominantly diarrhoea. CRE had a significant impact upon the physical, psychological and social aspects of life of sufferers, enforcing some to be virtually housebound. Other sufferers were managing their symptoms with regular medication and/or self-imposed restricted diets. Few of these women had ever sought professional help in dealing with their problems because of embarrassment or reluctance to complain. Conclusions: If untreated the side-effects of CRE have a disabling affect on sufferers, who may be reluctant to seek help about their symptoms. Health professionals need to be more pro-active in identifying and caring for sufferers of CRE.
Mediators Involved in the Cancer Anorexia-Cachexia Syndrome: Past, Present and Future

Argilés JM, Busquets S, García-Martínez C and López-Soriano FJ

Nutrition (2005) 21(9): 977-985

Abstract

The cachectic syndrome, characterised by a marked weight loss, anorexia, asthenia, and anemia is invariably associated with the presence and growth of the tumor and leads to a malnutrition status due to the induction of anorexia or decreased food intake. In addition, the competition for nutrients between the tumor and the host leads to an accelerated starvation state, which promotes severe metabolic disturbances in the host, including hypermetabolism, which leads to an increased energetic inefficiency. Although the search for the cachectic factor(s) started a long time ago, and although many scientific and economic efforts have been devoted to its discovery, we are still a long way from knowing the whole truth. Present investigation is devoted to revealing the different signaling pathways, in particular transcriptional factors involved in muscle wasting. The main aim of the present review is to summarise and evaluate the different molecular mechanisms and catabolic mediators (both humoral and tumoral) involved in cancer cachexia since they may represent targets for future promising clinical investigations.

The Cancer Cachexia Syndrome: A Review of Metabolic and Clinical Manifestations

Esper DH and Harb WA


Abstract

The progressive deterioration in nutrition status frequently seen in cancer patients is often referred to as cancer cachexia. Unlike starvation, in which fat stores from adipose are depleted and protein is spared from skeletal muscle, neither fat nor protein is spared in cachexia. Cachexia affects nearly half of cancer patients, causing the clinical manifestations of anorexia, muscle wasting, weight loss, early satiety, fatigue, and impaired immune response. Cachexia does not only impede the response to chemotherapy but also is a major cause of morbidity and mortality. According to clinical studies, increasing caloric intake does not necessarily reverse cachexia. The pathophysiology of cachexia involves more complex mechanisms than simply caloric deficiency. The process appears to be mediated by circulating catabolic factors, either secreted by the tumor alone or in concert with host-derived factors, such as tumor necrosis factor-α (TNF-α), interleukins (IL-1 and IL-6), interferon (IFN-y), and leukemia inhibitory factor (LIF). The successful reversal of this process will require in-depth knowledge of the mechanisms involved, which will then enable the development of effective pharmacologic interventions that may not only improve quality of life, but more importantly, improve survival among cancer patients.
A Multidisciplinary Review of Nutrition Considerations in the Pediatric Oncology Population: A Perspective From Children’s Oncology Group


Abstract

Over the past few decades, great progress has been made in the survival rates of childhood cancer. As survival rates have improved, there has been an increased focus on supportive care. Nutrition is a supportive-care modality that has been associated with improved tolerance to chemotherapy, improved survival, increased quality of life, and decreased risk of infection in children undergoing anticancer therapy. Guidelines and assessment criteria have been proposed for the nutrition management of a child with cancer; however, there is no consistent use of criteria among institutions treating children with cancer. This review will present the current evidence and standards of practice incorporating aspects of nutrition, nursing, pharmacology, and psychosocial challenges to consider in the nutrition management of a child with cancer. Recommendations for clinical practice are presented.

Audit of Nutritional Guidelines for Head and Neck Cancer Patients Undergoing Radiotherapy

Wood K


Abstract

Background: Head and neck cancer patients being treated with radiotherapy are at an increased risk of malnutrition due to the severe side-effects, e.g. mucositis, odynophagia and xerostomia, impacting on the ability to eat and drink (Lees, Eur. J. Cancer Care 1997;6:45). Effective dietetic management involves identifying those patients malnourished or at risk of becoming so and incorporating nutritional intervention into their treatment plan (Lees, 1997). The use of gastrostomy tubes in this patient group has been shown to be acceptable (Lees, 1997; Magne et al., Eur. Arch. Otorhinololaryngol. 2001;258:89). By placing them prophylactically, the aim is to prevent a disruption to treatment and avoid an unnecessary admission for feeding. This audit was carried out to determine whether the implementation of locally produced nutritional guidelines improved the dietetic management of this patient group. Method: A prospective audit tool was used to collect data on 32 head and neck cancer patients undergoing radiotherapy. Data was collected weekly during the course of treatment and compared with data from previous audits. Weight change was the nutritional outcome measured. Results: More patients underwent combined treatment (radiotherapy postoperatively or with concurrent weekly chemotherapy) when compared with previous audits. However, implementation of the guidelines appeared to contribute to an improvement in dietetic management, as fewer patients lost weight over the course of radiotherapy and there were no admissions for feeding. The presence of a dietitian at the multidisciplinary head and neck clinic improved access and communication and this is also likely to have contributed to the improved management. Conclusions: Implementation of the guidelines led to an improvement in the nutritional management of this patient group. Implementation may be more likely if a dietitian is present at the combined head and neck clinic.
Nutrition Issues in Hematopoietic Stem Cell Transplantation: State of the Art

Lipkin AC, Lenssen P and Dickson BJ

Abstract
There have been many changes in hematopoietic stem cell transplantation (HSCT) that affect the patient’s nutrition support. In the early 1970s, allogeneic transplants were the most common types of HSCTs; today, autologous transplants are the most common. Bone marrow, peripheral blood, and umbilical cord blood all now serve as sources of stem cells. Conditioning therapies include myeloablative, reduced-intensity myeloablative, and nonmyeloablative regimens. New medications are being developed and used to minimise the toxicities of the conditioning therapy and to minimise infectious complications. Supportive therapies for renal and liver complications have changed. In the past, HSCT patients received parenteral nutrition (PN) throughout their hospitalisation and sometimes as home therapy. Because of medical complications and cost issues associated with PN, many centres are now working to use less PN and increase use of enteral nutrition. The immunosuppressed diet has changed from a sterile diet prepared under laminar-flow hoods to a more liberal diet that avoids high-risk foods and emphasises safety in food handling practices. This article will review these changes in HSCT and the impact of these changes on the nutrition support of the patient.

Graft-vs-Host Disease: Nutrition Therapy in a Challenging Condition

Roberts S and Thompson J

Abstract
Graft-vs-host disease (GVHD) is a major complication after allogeneic hematopoietic stem cell transplantation. Both acute and chronic forms of GVHD are challenging to manage medically and nutritionally. Patients with advanced GVHD commonly become depleted nutritionally, with loss of lean body mass (LBM) and functional status. We present 2 case reports of patients who developed GVHD and subsequent nutrition decline. Although both patients were candidates for specialised nutrition support (SNS), only 1 was able to receive enteral and parenteral nutrition due to GVHD complications preventing access for provision of SNS. Fortunately, the patients have remained in remission from their hematologic malignancy, but they continue to cope with chronic GVHD and its consequences. These cases exhibit the complexity of managing a patient with extensive GVHD and nutrition interventions for clinicians to consider to optimise outcomes.
**Adjusted Body Weight, Pro: Evidence to Support the Use of Adjusted Body Weight in Calculating Calorie Requirements**

Krenitsky J


**Abstract**

The optimal nutrition regimen for obese hospitalised patients remains controversial, and clinicians use a variety of different methods for estimating needs of obese patients who require nutrition support. Adjusted body weight has been proposed as one method to improve the accuracy of predictive equations when calculating calorie expenditure of obese patients. Although adjusted body weight has been criticised as a “nonscientific method,” several studies have investigated the accuracy of adjusted body weight calculations and found it comparable or superior to several prediction equations. This article will summarise the results and discuss the limitations of data from studies regarding calculations for obese hospitalised patients. The use of adjusted body weight is discussed in the context of what is clinically significant in calculations of energy expenditure and in light of the limitations of current outcome data.

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**Adjusted Body Weight, Con: Why Adjust Body Weight in Energy-Expenditure Calculations?**

Ireton-Jones C


**Abstract**

Evaluation of energy requirements of normal individuals and hospitalised patients is most often accomplished using an energy equation. Energy equations attempt to measure resting metabolic rate (RMR), the largest factor in total daily energy expenditure. Components of most energy equations include height, weight, age, and gender. These factors are related to energy expenditure; however, each factor has individual characteristics that affect energy expenditure. Body weight is a major factor in RMR and total daily energy expenditure. For obese individuals, estimation of energy expenditure may be a challenge due to the increased body weight. Therefore, some equations attempt to minimise the effect of body weight on energy expenditure assessment by adjusting the obese individual's body weight. Data do not support adjustment of body weight in normal individuals. In hospitalised patients, there are several equations that are used to estimate energy expenditure of obese patients, which include adjusting the body weight and modifying the overall energy requirements. Measurement of RMR can obviate the need for estimating energy expenditure. It is important to evaluate any energy-expenditure equation that is used to estimate energy needs in normal people and hospitalised patients before applying it to patient care.
Confirmation of Nasogastric Tube Position by pH Testing

Taylor SJ and Clemente R


Abstract

Introduction: In 2004, the Medicines and Healthcare products Regulatory Agency (MHRA) advised that nasogastric (NG) tube position should be confirmed using pH strips or paper. However, gastric pH is raised by the use of H2-blockers and proton-pump inhibitors (PPIs) potentially producing false negative pH tests resulting in delayed feeding. In addition, colorimetric differentiation using pH strips may be more prone to bias and inaccuracy than direct pH measurements largely used to establish the threshold. Method: To quantify this problem a 1 day survey of all the patients requiring NG and nasointestinal (NI) feeding was undertaken, to establish the numbers of patients receiving H2-blockers or PPIs, with or without a safe swallow and the methods currently being used to confirm tube positioning. A second observational study was performed to establish the accuracy of six pH strips available to NHS trusts against four unlabelled pH solutions. Results: Forty-two per cent of patients receiving NG feeding were on H2-blockers or PPIs, including 13% who had a safe swallow for acidic drinks that could be subsequently aspirated to confirm position. In the second study ‘testers’ correctly identified pH's 3, 4, 5 and 6 with Mackery-Nagel 0-6, BDH 0-6 and 0-14 strips but overestimated pH 4 as pH 5 with Johnson 0-11 paper, underestimated pH 6 as pH 5 with Pehanon 0-12 paper and with Litmus classified pH 3-5 as acid (all), but half also classified pH 6 as acid. Conclusion: Theoretically 29% of NG tube positions could not be confirmed by pH testing because of the usage of PPIs or H2-blockers and lack of swallow. Some pH strips are either inaccurate or their result misinterpreted by staff. Large surveys and trials of the actual efficacy and accuracy of pH testing are required.
Reference List

Useful references on Enteral Nutrition Support

  This review focuses on both the preclinical and clinical data of Omega-3 fatty acids for treating this syndrome and includes a discussion of how this data might be interpreted and explained to cancer patients who are striving to cope with this syndrome.

  This consensus statement has been published by ESPEN who asked a multidisciplinary group to prepare guidelines and a consensus report on current aspects of artificial nutrition via PEG tubes in adults and children.

  These standards have been produced by the American Society for Parenteral and Enteral Nutrition Board for patients receiving home enteral or parenteral nutrition.

  This article examines some of the causes of dysphagia in older patients, its impact on medication management and practical ways for nurses to meet this challenge.

  This article outlines the care required for an adult patient with a fine bore nasogastric tube.

  This article reports on the progress of the better hospital food programme, which was implemented to improve services and give back more control over food to nurses.

  This article describes the use of a new fixing method for nasogastric tubes.

  This article provides practical information on the procedure for nasogastric tube insertion.

  This article illustrates one trust’s implementation of the MHRA directive to use pH paper in place of litmus paper when testing the position of nasogastric tubes.

  This article examines the role of education within nutrition support and whether over the years it has made a difference to patients’ nutritional status.

  This article presents and discusses the fundamentals involved in managing clinical risk in tube feeding.

  This case report discusses a case study of a patient admitted to a burns unit who was given nutrition support via the parenteral and enteral route and the use of immune modulating artificial nutrition support.

  This article reports on a study detailing the evaluation of adherence to nutrition supplements by patients with lower limb fractures.