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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
- British Journal of Nutrition
- Clinical Nutrition
- Complete Nutrition
- Critical Care Medicine
- Current Opinion in Clinical Nutrition and Metabolic Care
- Dysphagia
- European Journal of Clinical Nutrition
- Gastrointestinal Nursing
- GUT
- International Journal of Palliative Nursing
- 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 the American Geriatric Society
- Journal of Woundcare
- Lancet
- Nutrition
- Nutrition in Clinical Practice
- Nursing in 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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Does looped nasogastric tube feeding improve nutritional delivery for patients with dysphagia after acute stroke? A randomised controlled trial

J Beavan, S P Conroy, R Harwood, J R F Gladman, J Leonardi-Bee, T Sach, T Bowling, W Sunman and C Gaynor

Age and Ageing (2010) 39 (5): 624-630

Abstract

Background: nasogastric tube (NGT) feeding is commonly used after stroke, but its effectiveness is limited by frequent dislodgement. **Objective:** the objective of the study was to evaluate looped NGT feeding in acute stroke patients with dysphagia. **Methods:** this was a randomised controlled trial of 104 patients with acute stroke fed by NGT in three UK stroke units. NGT was secured using either a nasal loop (n = 51) or a conventional adhesive dressing (n = 53). The main outcome measure was the proportion of prescribed feed and fluids delivered via NGT in 2 weeks post-randomisation. Secondary outcomes were frequency of NGT insertions, treatment failure, tolerability, adverse

events and costs at 2 weeks; mortality; length of hospital stay; residential status; and Barthel Index at 3 months. **Results:** participants assigned to looped NGT feeding received a mean 17% (95% confidence interval 5-28%) more volume of feed and fluids, required fewer NGTs (median 1 vs 4), and had fewer electrolyte abnormalities than controls. There was more minor nasal trauma in the loop group. There were no differences in outcomes at 3 months. Looped NGT feeding cost £88 more per patient over 2 weeks than controls. **Conclusion:** looped NGT feeding improves delivery of feed and fluids and reduces NGT reinsertion with little additional cost.

Can continuous pump feeding reduce the incidence of pneumonia in nasogastric tube-fed patients? A randomized controlled trial

J S W Lee, T Kwok, P Y Chui, F W S Ko, W K Lo, W C Kam, H L F Mok, R Lo and J Woo

Clinical Nutrition (2010) 29 (4): 453-458

Abstract

Background & aims: Continuous pump feeding is often used to reduce aspiration risk in older patients on tube feeding, but its effectiveness in preventing aspiration pneumonia is unproven. A randomized controlled trial was therefore performed to examine the effectiveness of continuous pump feeding in decreasing the incidence of pneumonia in tube-fed older hospital patients. **Methods:** One hundred and seventy eight elderly patients from three convalescence hospitals and one infirmary, on nasogastric tube feeding, were randomly assigned to have intermittent bolus (bolus) or continuous pump (pump) feeding for 4 weeks. The primary outcome was the incidence of pneumonia. The secondary outcome was mortality. **Results:** Eighty five

subjects were randomized into the pump group and 93 in the bolus group. The groups were comparable in age, nutritional and functional status, co-morbidities and history of pneumonia, except that there were more women in the pump group. Within 4 weeks, 15 subjects (17.6%) in the pump group and 18 (19.4%) in the bolus group developed pneumonia. Seven subjects (8.2%) in pump group and 13 subjects (14.0%) in bolus group died. There was no significant difference in either pneumonia or death rates between the two groups. **Conclusion:** Continuous pump feeding did not significantly affect the rates of pneumonia or mortality in tube-fed older hospital patients when compared with intermittent bolus feeding.

Tract disruption and external displacement following gastrostomy tube exchange in adults

J K DiBaise, L Rentz, M D Crowell, G Anton Decker and T Lunsford

Journal of Parenteral and Enteral Nutrition (2010) 34 (5): 426-430

Abstract

Background: Anecdotal reports, mostly in children, indicate that disruption of the gastrostomy tract may occur during gastrostomy tube exchange and cause serious complications. The aim of our study was to determine the rate of tract disruption occurring in adults requiring long-term enteral nutrition who had an original gastrostomy tube replaced and to evaluate factors contributing to this complication. **Methods:** We retrospectively reviewed the medical records of all patients who underwent replacement of their gastrostomy tube over a 3-year period. Information was collected relating to patient demographics, underlying diagnosis, method of insertion and tube type used for initial gastrostomy tube and subsequent tube replacement, staff involved in tube replacement, patient nutritional status at the time of tube change, and the number of days from initial tube placement to replacement. For

comparative purposes, the patients were divided into 2 groups: those with tract disruption and those without tract disruption. **Results:** A total of 182 tube changes in 108 adults were performed; 55 were initial tube changes. Four (7.3%) tract disruptions occurred, all with skin-level replacement devices and only with the initial replacement of the original gastrostomy tube. There were no significant differences in patient demographics, principal diagnosis, method of insertion and tube type used for initial gastrostomy tube, staff involved in tube replacement, patient nutritional status at the time of tube change, or the number of days from initial tube placement to replacement. **Conclusion:** Tract disruption occurs infrequently during replacement of gastrostomy tubes and appears to be an issue primarily during the initial tube exchange when using a skin-level device.

Monitoring of home safety issues in children on enteral feeds with inherited metabolic disorders

S Evans, F Shelton, C Holden, A Daly, V Hopkins and A MacDonald

Archives of Diseases in Childhood (2010) 95 (9): 668-672

Abstract

Objective: To assess the safety aspects of carers' enteral feeding technique when home enteral tube feeding children with inherited metabolic disorders (IMD). **Methods:** 40 patients (median age, 5.1 years; range, 0.3-13.6 years) with IMD requiring pump tube feeding were recruited. 12 patients had glycogen storage disease, 11 organic acidemias, 8 fatty acid oxidation disorders, 4 urea cycle disorders, and 5 had other conditions. 50% of the patients were fed by gastrostomy and 50% nasogastric tube. A questionnaire and practical assessment of feeding process was completed with carers by a dietician and nurse in the child's home. Areas investigated included carer hygiene, feed preparation, tube care, tube changing, use of feeding pumps and equipment, and storage of enteral feeding equipment.

Results: The main issues identified were poor hygiene practices (78% unclean work surfaces; 25% no hand washing); inaccurate ingredient measuring (40%); irregular checking of tube position (40%); inadequate tube flushing (50%); poor knowledge of how to clear tube blockages (80%); incorrect priming of pump sets (50%); incorrect position of child for night feeding (63%); untrained secondary carers (43%); and poor knowledge of pump alarms, battery life, and charging time. Children commonly slept in parent's room as a safety precaution (58%). **Conclusions:** Long term follow-up of children with IMD on home enteral tube feeding suggests that regular updates on knowledge and technique for carers may be necessary to reduce risk.

The enhanced recovery after surgery (ERAS) pathway for patients undergoing major elective open colorectal surgery: A meta-analysis of randomized controlled trials

K K Varadhan, K R Neal, C H C Dejong, K C H Fearon, O Ljungqvist and D N Lobo

Clinical Nutrition (2010) 29 (4): 434-440

Abstract

Background & aims: The aim of the Enhanced Recovery After Surgery (ERAS) pathway is to attenuate the stress response to surgery and enable rapid recovery. The objective of this meta-analysis was to study the differences in outcomes in patients undergoing major elective open colorectal surgery within an ERAS pathway and those treated with conventional perioperative care. **Methods:** Medline, Embase and Cochrane database searches were performed for relevant studies published between January 1966 and November 2009. All randomized controlled trials comparing ERAS with conventional perioperative care were selected. The outcome measures studied were length of hospital stay, complication rates, readmission rates and mortality.

Results: Six randomized controlled trials with 452 patients were included. The number of individual ERAS elements used ranged from 4 to 12, with a mean of 9. The length of hospital stay [weighted mean difference (95% confidence interval): -2.55 (-3.24, -1.85)] and complication rates [relative risk (95% confidence interval): 0.53 (0.44, 0.64)] were significantly reduced in the enhanced recovery group. There was no statistically significant difference in readmission and mortality rates. **Conclusion:** ERAS pathways appear to reduce the length of stay and complication rates after major elective open colorectal surgery without compromising patient safety.

Malnutrition and associated factors in elderly hospital patients: A Belgian cross-sectional, multi-centre study

K Vanderwee, E Clays, I Bocquaert, M Gobert, B Folens and T Defloor

Clinical Nutrition 29 (4): 469-476

Abstract

Background & aims: In Belgium, general data on the prevalence of malnutrition are lacking. Prevalence rates are necessary to gain insight into the magnitude of malnutrition and to establish a nutrition policy that takes the limited health care resources into account. This study aimed to obtain insight into the prevalence of malnutrition in Belgian elderly hospital wards and to identify factors associated with the malnutrition prevalence. **Methods:** A cross-sectional, multi-centre study in elderly wards of Belgian hospitals. The nutritional status was assessed using the Mini Nutritional Assessment. A standardised questionnaire was used to record demographic data and data on potential factors associated with malnutrition.

Results: Out of 2329 elderly patients, 33% suffered from malnutrition. Almost 43% of the patients were at risk of malnutrition and 24% were well-nourished. Having swallowing difficulties, taste difficulties, and being transferred from a nursing home were strongly associated with being malnourished. **Conclusion:** The malnutrition prevalence in Belgian elderly hospital wards is similar to international figures. Elderly who have swallowing difficulties, taste difficulties, or coming from a nursing home may need adequate nutritional care. Given the negative impact of malnutrition on mortality and morbidity, an emphasis should be placed on an effective nutritional policy.

Anthropometry and body composition analysis in children with cerebral palsy

H Y Tomoum, N B Badawy, N E Hassan and K M Alian

Clinical Nutrition (2010) **29** (4): 477-481

Abstract

Background & aims: This study was undertaken to describe anthropometry, body composition parameters and assess serum levels of leptin and other biochemical markers of the nutritional status in a sample of Egyptian children with cerebral palsy (CP). **Methods:** Anthropometric measurements (body weight, knee height, head, mid-upper arm, waist and hip circumferences, triceps and subscapular skin-fold thickness) were taken. Using the bioelectrical impedance technique, total body water (TBW), fat-free mass, fat mass, fat percentage and basal metabolic rate (BMR) were calculated. Serum levels of total proteins, albumin, ferritin and leptin were measured. Results were compared to that of healthy controls. **Results:** Patients had significantly lower

anthropometric measurements than controls, except for mid-upper arm and hip circumferences, and subscapular skin-fold thickness which were not different in both groups. Fat mass, fat free mass, fat percentage, TBW and BMR were lower in the patients. Serum protein and leptin levels were not different in patients and controls, though other biochemical markers were reduced in the patients. Patients with more severe motor handicap had lower skin-fold thickness, fat percentage and serum ferritin than those with milder affection. **Conclusion:** Parameters of growth, body composition analysis and nutritional status are significantly altered in CP patients especially those with severe motor handicap and oromotor dysfunction.

Comparison of two malnutrition risk screening Methods: (MNA and NRS 2002) and their association with markers of protein malnutrition in geriatric hospitalized patients

T Drescher, K Singler, A Ulrich, M Koller, U Keller, M Christ-Crain and R W Kressig

European Journal of Clinical Nutrition (2010) **64** (8): 887-893

Abstract

Background: Malnutrition occurs frequently in the elderly and is associated with increased morbidity and mortality. The mini-nutritional assessment (MNA) has been used most frequently in the geriatric literature. The nutritional risk screening 2002 (NRS) has been proposed as universal screening method for hospitalized patients. The aim of our study was to compare both tools as they are correlated with protein malnutrition. **Methods:** MNA, NRS, and markers of protein malnutrition were measured in 104 consecutive inpatients admitted to an acute geriatric ward. **Results:** The median age was 84 years (IQR: 78-89), 81 were females. The median body mass index was 23.1 kg/m² (IQR: 20-27.3), the median upper-arm and calf circumferences were 25 cm (IQR: 23-29) and 33 cm (IQR: 29-36). According to

MNA, 23 patients were malnourished, 50 at risk of malnutrition, and 31 had a normal nutritional status. The NRS indicated that 35 were at moderate to severe risk of malnutrition and 69 at low risk. Serum prealbumin and retinol-binding protein concentrations were inversely associated with the severity of malnutrition as indicated by the NRS ($P=0.06$ and <0.01 , respectively), whereas the MNA was not associated with these serum proteins. After adjustment for C-reactive protein and creatinine clearance, only retinol-binding protein concentrations were consistently associated with both malnutrition scores. **Conclusions:** The NRS seems to be superior compared with the MNA and serum proteins in identifying elderly patients at risk of malnutrition during acute intercurrent illness.

Reduced nutritional status among multiple myeloma patients during treatment with high-dose chemotherapy and autologous stem cell support

P O Iversen, F Wisløff and N Gulbrandsen

Clinical Nutrition (2010) 29 (4): 488-491

Abstract

Background & aims: Multiple myeloma (MM) ranks among the most frequent blood cancers in adults. Optimal treatment consists of high-dose chemotherapy and autologous stem cell transplantation. Health-related quality of life (HRQoL) is reduced before, during, and after therapy. Several HRQoL items are associated with nutritional health, e.g., nausea/vomiting, appetite loss and fatigue. It is unknown whether nutritional status in MM is affected by treatment. Hence we assessed nutritional status before, during and ½ year after treatment-start. **Methods:** We applied anthropometry (height, weight, hand-grip strength, triceps skinfold) and plasma concentrations of biomarkers to assess nutritional status. HRQoL was determined with the EORTC

QLQ-C30 questionnaire. **Results:** The anthropometrical parameters all decreased ($p < 0.05$) during treatment, but were restored at the end of the observation period. Albumin and the fat-soluble vitamins D and E followed a similar pattern, whereas transferrin and vitamin A were unchanged ($p > 0.05$). Interestingly, markers of thyroid function declined and remained low ($p < 0.05$) even 6 months after start of therapy. Nutrition-associated symptoms used as markers of HRQoL worsened during therapy, but returned to pre-therapy levels. **Conclusion:** Intensive therapy in MM is associated with a decline in both nutritional status and health-related quality of life.

Nutritional status, nutrition practices and post-operative complications in patients with gastrointestinal cancer

A K Garth, C M Newsome, N Simmance and T. C. Crowe

Journal of Human Nutrition and Dietetics (2010) 23 (4): 393-401

Abstract

Background: Malnutrition and its associated complications are a considerable issue for surgical patients with upper gastrointestinal and colorectal cancer. The present study aimed to determine whether specific perioperative nutritional practices and protocols are associated with improved patient outcomes in this group. **Methods:** Patients admitted for elective upper gastrointestinal or colorectal cancer surgery ($n = 95$) over a 19-month period underwent a medical history audit assessing weight changes, nutritional intake, biochemistry, post-operative complications and length of stay. A subset of patients ($n = 25$) underwent nutritional assessment by subjective global assessment prior to surgery in addition to assessment of post-operative medical outcomes, nutritional intake and timing of dietetic intervention. **Results:** Mean (SD) length of stay for patients was 14.0 (12.2) days, with complication rates at 35%. Length of stay was significantly longer in patients who experienced significant preoperative

weight loss compared to those who did not [17.0 (15.8) days versus 10.0 (6.8) days, respectively; $P < 0.05$]. Low albumin and post-operative weight loss were also predictive of increased length of stay. Of patients who underwent nutritional assessment, 32% were classified as mild-moderately malnourished and 16% severely malnourished. Malnourished patients were hospitalised twice as long as well-nourished patients [15.8 (12.8) days versus 7.6 (3.5) days; $P < 0.05$]. Time taken [6.9 (3.6) days] to achieve adequate nutrition post surgery was a factor in post-operative outcomes, with a positive correlation with length of stay ($r = 0.493$; $P < 0.01$), a negative correlation with post-operative weight change ($r = -0.417$; $P < 0.05$) and a greater risk of complications (52% versus 13%; $P < 0.01$). **Conclusions:** Malnutrition is prevalent among surgical patients with gastrointestinal cancer. Poor nutritional status coupled with delayed and inadequate post-operative nutrition practices are associated with worse clinical outcomes.

Nutritional status of preoperative colorectal cancer patients

S T Burden, J Hill, J L Shaffer, C Todd

Journal of Human Nutrition and Dietetics (2010) 23 (4): 402-407

Abstract

Background: The present study aimed to determine the extent of malnutrition in preoperative colorectal cancer patients. Malnutrition has been shown to affect post-operative outcome, so it would be beneficial to identify those who are malnourished or who are at risk of becoming so preoperatively. We examine whether weight loss is related to the length of stay or changes in fat free mass. **Methods:** Patients were enrolled consecutively from outpatients 2-4 weeks prior to surgery. Assessments included body mass index, percentage weight loss, dynamometry, Malnutrition Universal Screening Tool, Subjective Global Assessment and bioelectrical impedance. Cancer staging and hospital length of stay were recorded. **Results:** One hundred and thirty-two patients were eligible and 87 enrolled. Sixty-seven patients were weight losing and

20% had lost >10% of their usual body weight. Handgrip strength was lower in malnourished patients compared to those who had not lost weight (mean 19.4 and 27.3 kg, respectively, $P = 0.013$). Mean (SD) fat free mass in patients with a weight loss >10% was 39.7 (13.5) kg and, in those with <10% weight loss, was 51.9 (12.0) kg ($P = 0.001$). This difference was not demonstrated for fat.

Conclusions: Over half of these patients had lost weight prior to surgery and one in five were malnourished. Body composition measurements demonstrated that malnourished patients had significantly less fat free mass compared to patients who were not clinically malnourished. Nutritional screening would be beneficial in this group preoperatively to identify weight-losing patients at an early stage in the care pathway when they initially enter the secondary care system.

Comprehensive assessment of malnutrition risk and related factors in a large group of community-dwelling older adults

Z Ülger, M Halil, I Kalan, B Balam Yavuz, M Cankurtaran, E Güngör and S Arıođul

Clinical Nutrition (2010) 29 (4): 507-511

Abstract

Background & aims: Older adults are poorly assessed for malnutrition risk although malnutrition is not an uncommon problem in this population. The aim of this study was to determine the malnutrition risk and its correlates in geriatric outpatients. **Method:** The study was performed in 2327 patients ≥ 65 years old who were admitted to our Geriatric Medicine outpatient clinic. Together with comprehensive geriatric assessment, nutritional assessment with short version of mini nutritional assessment test (MNA-SF) was performed. MNA-SF score ≤ 11 was determined as malnutrition risk. **Results:** Mean age of patients was 72.14 ± 6.11 and 1479 (63.6%) were female. Mean MNA-SF score was

12.31 ± 2.18 . The number of patients with MNA-SF score ≤ 11 was 651 (28%). Depression, haematocrit, plasma fasting glucose, albumin, erythrocyte sedimentation rate, instrumental activities of daily living scores and bone mineral density measured from total femur were found to be significantly associated with malnutrition risk. **Conclusion:** In this study malnutrition risk was detected in 651 (28%) patients. This ratio was similar to the literature. In older adults malnutrition risk is found to be increased due to majority of chronic illnesses and physical dependency. In conclusion, nutritional assessment should be a part of comprehensive geriatric assessment.

The impact of nutrition on cirrhotic patients awaiting liver transplantation

L G Ferreira

Current Opinion in Nutrition and Metabolic Care (2010) 13 (5): 554-561

Abstract

Purpose of review: To review the most recent aspects of nutrition therapy of cirrhotic patients on the waiting list for liver transplantation. **Recent findings:** Undernutrition has been widely reported among these patients, despite the lack of consensus on the best nutritional assessment tools in this population. Nutrition therapy has been marked by controversy. Nonetheless, recent findings have pointed out to the important role of the nutrition status and of some specific nutrients on the outcome of these patients.

Summary: We report the latest findings on nutrition care of patients with end-stage liver disease on the waiting list for liver transplantation such as the impact of the nutritional status on outcome, probiotic and branched-chain amino acid supplementation, as well as the use of immunomodulating formula. Another important strategy that has been shown to improve these patients' nutritional care is the offering of nocturnal meals and micronutrient supplementation.

Gastric residual volume during enteral nutrition in ICU patients: the REGANE study

J C Montejo, E Miñambres, L Bordejé, A Mesejo, J Acosta, A Heras, M Ferré, F Fernandez-Ortega, C I Vaquerizo and R Manzan

Intensive Care Medicine (2010) 36 (8): 1386-1393

Abstract

Objective: To compare the effects of increasing the limit for gastric residual volume (GRV) in the adequacy of enteral nutrition. Frequency of gastrointestinal complications and outcome variables were secondary goals. **Design:** An open, prospective, randomized study. **Setting:** Twenty-eight intensive care units in Spain. **Patients:** Three hundred twenty-nine intubated and mechanically ventilated adult patients with enteral nutrition (EN). **Interventions:** EN was administered by nasogastric tube. A protocol for management of EN-related gastrointestinal complications was used. Patients were randomized to be included in a control (GRV = 200 ml) or in study group (GRV = 500 ml). **Measurements and Results:** Diet volume ratio (diet received/diet prescribed), incidence of gastrointestinal complications, ICU-acquired pneumonia, days on

mechanical ventilation and ICU length of stay were the study variables. Gastrointestinal complications were higher in the control group (63.6 vs. 47.8%, $P = 0.004$), but the only difference was in the frequency of high GRV (42.4 vs. 26.8%, $P = 0.003$). The diet volume ratio was higher for the study group only during the 1st week (84.48 vs. 88.20%) ($P = 0.0002$). Volume ratio was similar for both groups in weeks 3 and 4. Duration of mechanical ventilation, ICU length of stay or frequency of pneumonia were similar. **Conclusions:** Diet volume ratio of mechanically ventilated patients treated with enteral nutrition is not affected by increasing the limit in GRV. A limit of 500 ml is not associated with adverse effects in gastrointestinal complications or in outcome variables. A value of 500 ml can be equally recommended as a normal limit for GRV.

Gastric versus transpyloric feeding in severe traumatic brain injury: a prospective, randomized trial

J Acosta-Escribano, M Fernández-Vivas, T Grau Carmona, J Caturla-Such, M Garcia-Martinez, A Menendez-Mainer, M Solera-Suarez and J Sanchez-Payá

Intensive Care Medicine (2010) 36 (9): 1532-1539

Abstract

Purpose: To evaluate the efficacy of transpyloric feeding (TPF) compared with gastric feeding (GF) with regard to the incidence of ventilator-associated pneumonia in severe traumatic brain injury patients (TBI). **Design and setting:** Prospective, open-label, randomized study in an intensive care unit of a university hospital. **Patients:** One hundred and four CHI adult patients admitted for TBI between April 2007 and December 2008. Patients were included within the first 24 h after ICU admission and were followed until discharge or 30 days after admission. **Intervention:** Patients were randomized to TPF or GF groups. They received the same diet, with 25 kcal kg⁻¹ day⁻¹ of calculated energy requirements and a nitrogen intake of 0.2 g N kg⁻¹ day⁻¹. Primary outcome was the incidence of

early and ventilatory-associated pneumonia. Secondary outcomes were enteral nutrition-related gastrointestinal complications (GIC), days on mechanical ventilation, length of ICU stay and hospital stay, and sequential organ failure assessment score (SOFA). **Results:** The TPF group had a lower incidence of pneumonia, OR 0.3 (95% CI 0.1-0.7, P = 0.01). There were no significant differences in other nosocomial infections. The TPF group received higher amounts of diet compared to the GF group (92 vs. 84%, P < 0.01) and had lesser incidence of increased gastric residuals, OR 0.2 (95% CI 0.04-0.6, P = 0.003). **Conclusions:** Enteral nutrition delivered through the transpyloric route reduces the incidence of overall and late pneumonia and improves nutritional efficacy in severe TBI patients.

Immunonutrition in high-risk surgical patients: A Systematic Review and Analysis of the Literature

P E Marik and G P Zaloga

Journal of Parenteral and Enteral Nutrition (2010) 35 (5): 378-386

Abstract

Background: Immunomodulating diets (IMDs) have been demonstrated to improve immune function and modulate inflammation. However, the clinical benefit of these diets in patients undergoing elective surgery is controversial. The goal of this meta-analysis was to determine the impact of IMDs on the clinical outcomes of high-risk patients undergoing elective surgery. **Methods:** The review included prospective, controlled, clinical trials that compared the clinical outcome of elective surgical patients who were randomized to receive an IMD or a control enteral diet. Studies were stratified according to the type of IMD and the timing of the initiation of the IMD. Data were abstracted on study design, study size, patient population, and IMD used. The outcomes of interest were the acquisition of new infections, wound complications, length of hospital

stay (LOS), and mortality. Meta-analytic techniques were used to analyze the data. **Results:** Twenty-one relevant studies were identified, which included a total of 1918 patients. Immunonutrition significantly reduced the risk of acquired infections, wound complications, and LOS. The mortality rate was 1% in both groups. The treatment effect was similar regardless of the timing of the commencement of the IMD. The benefits of immunonutrition required both arginine and fish oil. **Conclusions:** An immunomodulating enteral diet containing increased amounts of both arginine and fish oil should be considered in all high-risk patients undergoing major surgery. Although the optimal timing cannot be determined from this study, it is suggested that immunonutrition be initiated preoperatively when feasible.

Basics in nutrition and wound healing

T Wild, A Rahbarnia, M Kellner, L Sobotka and T Eberlein

Nutrition (2010) 26 (9): 862-866

Abstract

Wound healing is a process that can be divided into three different phases (inflammatory, proliferative, and maturation). Each is characterized by certain events that require specific components. However, wound healing is not always a linear process; it can progress forward and backward through the phases depending on various intrinsic and extrinsic factors. If the wound-healing process is affected negatively, this can result in chronic wounds. Chronic wounds demand many resources in the clinical daily routine. Therefore, local wound management and good documentation of the wound is essential for non-delayed wound healing and prevention of the development of chronic wounds. During the wound-healing process much energy is needed. The energy

for the building of new cells is usually released from body energy stores and protein reserves. This can be very challenging for undernourished and malnourished patients. Malnutrition is very common in geriatric patients and patients in catabolic phases of stress such as after injury or surgery. For that reason a close survey of the nutritional status of patients is necessary to start supplementation quickly, if applicable. Wound healing is indeed a very complex process that deserves special notice. There are some approaches to develop guidelines but thus far no golden standard has evolved. Because wounds, especially chronic wounds, cause also an increasing economic burden, the development of guidelines should be advanced.

The relationship between malnutrition parameters and pressure ulcers in hospitals and nursing homes

E S M Shahin, J M M Meijers, J M G A Schols, A Tannen, R J G Halfens and T Dassen

Nutrition (2010) 26 (9): 886-889

Abstract

Objectives: Pressure ulcers (PU) remain a major health care problem throughout the world. Although malnutrition is considered to be one of the intrinsic risk factors for PU, more evidence is needed to identify the exact relation between PU and malnutrition. This study aims to identify whether there exists a relationship between PU and malnutrition in hospitals and nursing homes. **Methods:** A cross-sectional study was performed in April 2007 in hospitals and nursing homes in Germany. PU were assessed using the Braden scale. Malnutrition was assessed by low body mass index (BMI), undesired

weight loss, and insufficient nutritional intake. **Results:** Two thousand three hundred ninety-three patients from 29 nursing homes and 4067 patients from 22 hospitals participated in the study. PU in both hospital and nursing home patients were significantly ($P < 0.01$) related to undesired weight loss (5%-10%). Moreover low nutritional intake and low BMI (<18.5) were also significantly related to PU in hospitals and nursing homes. **Conclusion:** There is a significant relationship between malnutrition parameters like undesired weight loss, BMI < 18.5 , and low nutritional intake and PU.

Estimation of protein loss from wound fluid in older patients with severe pressure ulcers

S Iizaka, H Sanada, G Nakagami, Rie Sekine, H Koyanagi, C Konya and J Sugama
Nutrition (2010) 26 (9): 890-895

Abstract

Objective: Protein loss from wound fluid is usually recognized as one of the factors contributing to the deterioration of the nutritional status in older patients with severe pressure ulcers. We quantified the protein loss owing to pressure ulcers and investigated associations with wound-related factors and nutritional status. **Methods:** This cross-sectional study included 25 patients (≥ 60 y) from 10 institutions, with full-thickness pressure ulcers. Wound fluid was collected once after accumulating beneath a film dressing. The amount of protein loss per day was estimated by the volume of wound fluid per hour and the total protein concentration in the wound fluid. Wound evaluations and nutritional assessments were performed. Correlations between variables were obtained using Spearman's rank correlation. **Results:** The median age of the

patients was 79 y (range 61-100), and median body mass index was 19.6 kg/m² (12.2-24.9). The median amount of protein loss was 0.2 g/d (0.04-2.1), which corresponded to 0.01 g · kg⁻¹ · d⁻¹ (<0.01-0.04) and 0.6% (0.1-13.8) of protein intake. Four wounds characterized as infected or surgically debrided lost 1.5-2.1 g of protein per day, which was substantially higher than other wounds lost. Protein loss was correlated with wound severity including area, depth, the wound severity score, and infectious markers (all Ps < 0.05), but not with body mass index or arm muscle circumference (P > 0.05). **Conclusion:** The amount of protein loss could be small and thus may not be related directly to nutritional status, although it increased as the wound became more severe.

Nutrition in pediatric inflammatory bowel disease

D P Mallon and D L Suskind

Nutrition and in Clinical Practice (2010) 25 (4): 335-339

Abstract

Nutrition interventions play a central role in the treatment and management of inflammatory bowel disease in children. Malnutrition is a common presenting symptom in both pediatric ulcerative colitis and Crohn's disease and is associated with increased morbidity. Providing macronutrients can improve growth; likewise, identifying and correcting micronutrient deficiencies

can improve comorbid conditions like osteopenia and anemia. Although many patients manipulate their diets to help treat their inflammatory bowel disease, only parenteral nutrition with bowel rest and exclusive enteral nutrition therapy have been shown effective for the treatment of inflammatory bowel disease.

Nutrition treatment of deficiency and malnutrition in chronic pancreatitis: A review

S Duggan, M O'Sullivan, S Feehan, P Ridgway and K Conlon

Nutrition in Clinical Practice (2010) 25 (4): 362-370

Abstract

Chronic pancreatitis results in exocrine and endocrine dysfunction, affecting normal digestion and absorption of nutrients. In individuals with chronic pancreatitis, nutrition status may be further affected by poor dietary intake, often related to alcoholism. However, some deficiencies may be overlooked, potentially leading to

nutrition-related problems with bone health and fatigue. The aim of this article is to describe the deficiencies that occur and to propose an evidence-based algorithm for the nutrition assessment and treatment of patients with chronic pancreatitis.

The high impact actions for nursing and midwifery 1: keeping nourished - getting better

L Ward, K Fenton and L Maher

Nursing Times (2010) 106 (27): 10-11

Abstract

Approximately one in four patients in NHS hospitals are either malnourished or at risk of malnutrition and as much as 70% of malnutrition in acute hospital admissions is unrecognised and unmanaged. Although most of those who are malnourished live in the community, malnutrition and dehydration are key challenges for NHS organisations. Well hydrated and

nourished patients get better more quickly, have a shorter length of stay and a more positive experience of care. Ensuring patients receive all of the nutrients they need is vital to the delivery of good care. This article, the second in our series on the high impact actions for nursing and midwifery, looks at how nurses can reduce malnutrition in their patients.

Home enteral tube feeding in older people: consideration of the issues

H Hitchings, C Best and I Steed

British Journal of Nursing (2010) **19(18)**: 1150-1154

Abstract

The demand for acute medical services for older people has risen in recent years and increasing numbers of older people are having enteral feeding tubes placed to ensure they receive appropriate levels of nutrition and fluid safely once oral diet becomes unsafe or insufficient. However, their care may be complicated by cognitive or functional deterioration as a result of comorbidities and polypharmacy. Consequently, providing enteral tube feeding in the community, once the patient is discharged from hospital, may not be straightforward. There are

a number of benefits to providing enteral feeding at home; however, problems will arise if appropriate training and aftercare are not provided. This article will address some of the issues that arise when patients who require home enteral feeding are discharged from hospital into their own homes, or into a care home, and examines the knowledge that is required to enable the patient and/or carer to safely manage the feeding tube and feeding regimen, and addresses some of the more common problems that may arise.

Reference List

Further references on nutrition support articles and studies published in the last quarter

- Nursing Times Safety in Practice (2010) Detecting problems after Gastrostomy. Nursing Times 106 (28): 10-11
This safety in practice guide outlines how to ensure that complications occurring after gastrostomy are detected and responded to without delay.
- Shepherd A (2010) The hand in hand nature of nutrition and cognitive decline. Nursing and residential care 12 (8): 370-377
This article reviews how to meet and exceed the nutritional needs of those with disease.
- Shepherd A (2010) Recognizing and treating dysphagia can help residents maintain their dignity. Nursing and residential care 12 (10): 491-494
This article explains how simple measures to diagnose and treat dysphagia can help people maintain the ability to eat independently.
- Banks M et al (2010) Malnutrition and pressure ulcer risk in Australian health care facilities. Nutrition 26 (9): 896-901
This paper reports on the effect of nutritional status on the presence and severity of pressure ulcers in Australian health care facilities.
- Van Anholt R D et al (2010) Specific nutritional support accelerates pressure ulcer healing and reduces wound care intensity in non-malnourished patients. Nutrition 26 (9): 867-872
This paper investigates the potential of specific nutritional supplementation on pressure ulcer wound healing.
- Kirshbaum M K et al (2010) Does protein and energy supplementation benefit older people at risk of malnutrition? Nursing Times 106 (39): 22
This evidenced based practice article looks at the Cochrane review of international evidence on oral nutritional supplements for older people.
- Merryfield C (2010) Nutrition and wound care. Complete Nutrition 2 (3): 9-12
This article discusses the importance of nutrition and wound care.

Notes
