



AUSPEN UPDATE

35TH ANNUAL SCIENTIFIC MEETING OF AUSPEN – PART 2

The 35th ASM in Christchurch, New Zealand, included two extremely well-attended workshops as satellites to the main meeting. The workshop for Adult Nutrition Therapy, sponsored by Baxter Health care, was entitled 'Understanding and Managing Acute Malnutrition in your Hospital – A team approach'. Topics addressed by AuSPEN speakers included: Nutrition Screening, Nutrition Assessment Techniques, Networking and Barriers to Change in the Acute Setting. There were additional guest lectures on: 'Salt and Water Drowning' and 'Techniques for Minimising Infection Risk from PN' from Dr Mike Stroud and Peter Austin, with a lot of interactive case studies throughout the day. The workshop concluded with a summing up and reflections from Dr Mary Hise, Associate Director of Medical Affairs for IV Therapy and Nutrition, Baxter Healthcare.

This year's travel grants, which were sponsored by Fresenius Kabi, for \$1000 each went to the following people:

- Julia Fox
- May Mak
- Gil Hardy (on behalf of Karen Winterbourne HPNer)
- Liz Rogers

A further selection of abstracts of free papers and posters from the ASM follow:

A PROSPECTIVE STUDY OF THE USE OF ENTERAL OR PARENTERAL NUTRITION IN SEVERE ACUTE PANCREATITIS PATIENTS IN AUSTRALIA AND NEW ZEALAND

A DAVIES^{1,2}, E RIDLEY^{1,2}, S MORRISON¹, K MCILROY³, M BANKS⁴, J COOPER^{1,2}, G HARDY⁵, A THOMSON⁶ AND THE AUDIT OF SEVERE ACUTE PANCREATITIS FEEDING PRACTICES INVESTIGATORS⁷

1. Australian and New Zealand Intensive Care Research Centre, Monash University, Melbourne, Australia; 2. Department of Intensive Care, The Alfred Hospital, Melbourne, Australia; 3. Department of Nutrition and Dietetics, Auckland and Starship Hospitals, New Zealand; 4. Department of Nutrition and Dietetics, Royal Brisbane & Women's Hospital, Queensland, Australia; 5. Faculty of Medical and Health Sciences, University of Auckland, New Zealand; 6. Gastroenterology and Hepatology Unit, The Canberra Hospital, Canberra, Australia. 7. A collaboration of AuSPEN and the ANZICS Clinical Trials Group.

Rationale: Nutrition therapy (NT) is now recognised as important in severe acute pancreatitis (SAP) for its simplicity and positive effects on patient outcomes. We aimed to determine the current NT practices of patients with SAP in Australasia with particular focus on the choice of enteral nutrition (EN) or parenteral nutrition (PN).

Methods: A prospective observational multi-centre study was performed in 40 sites in Australasia over 6 months during 2008. Patients were enrolled if they were admitted to the ICU or high dependency unit with a provisional diagnosis of acute pancreatitis. Those with chronic pancreatitis were excluded. The primary outcome measure was the proportion of days patients received NT. Statistical analysis was descriptive with normally distributed outcomes reported as means.

Results: We enrolled 121 patients, 117 were analysed. The mean age was 61 years and males were more common (53%). EN was delivered to 58 (50%) and PN to 49 (42%) patients overall. PN (59%) was more commonly used as the initial mode of NT than EN (41%). The most common reason recorded for use of PN was the treating doctor's preference. EN was delivered on 77% and PN



Fresenius Kabi stand in Exhibition area with Amanda Whiteman (L) and Candice Dobb (R)

on 41% of the total of 1184 days of NT. The overall proportion of target volume received was 75% for patients who received EN and 79% for PN.

Conclusions: The nutritional management of SAP in Australasia varies considerably and does not conform to the growing evidence favouring EN. EN was used most commonly throughout the study period, PN was the most common initial mode of NT. Patients who received PN met a greater proportion of NT targets. Improved education regarding current clinical practice guidelines for NT in patients with SAP is required.

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OMEGA-3 LIPID EMULSION IN PAEDIATRIC TPN-ASSOCIATED LIVER DISEASE – A CASE SERIES

N GUPTA¹, D GIBNEY^{1,2}, C CLARKSON¹, H KEPREOTES¹, R JACKSON¹, AS DAY^{1,3}

1. Sydney Children's Hospital and 2. Prince of Wales Hospital, Sydney, New South Wales; 3. School of Women's and Children's Health, University of New South Wales, Sydney Australia

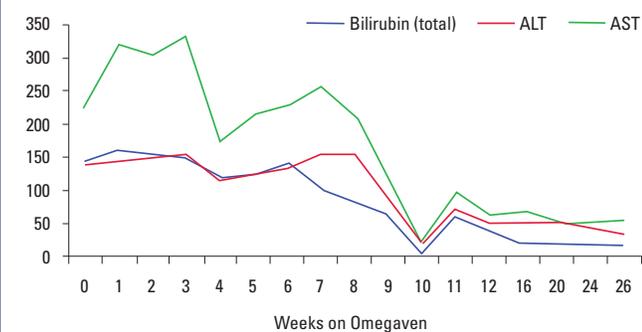
Introduction: Omega-3 lipid emulsion (Omegaven®) is increasingly recognised as an important adjunct to improve and even reverse TPN-associated liver disease; experience however has been limited to a handful of case reports from large centres internationally. We report our experience of omega-3 lipid emulsions in four children with TPN-associated liver disease failing to respond to conventional measures.

Methodology: Retrospective analysis was conducted in four children in whom Omegaven® replaced conventional lipid emulsions for their TPN-associated liver disease. Baseline and repeated measures of alanine transaminase (ALT), aspartate transaminase (AST) and bilirubin were analysed to determine the effect of Omegaven®. Paired t tests were reported where appropriate to ascertain any significant findings between the time points.



Results: The four children were a mean of 12 months of age. Short gut syndrome (n=2), hypoganglionosis (n=1) and mitochondrial enteropathy (n=1) were the primary indications for parenteral nutrition. Reductions in ALT, AST and Bilirubin were evident during the course of Omegaven® treatment (Figure 1). Trend lines indicate a delayed effect of Omegaven® with considerable reductions in biochemical abnormalities seen after eight weeks. No statistically significant differences were found, however the small sample size limited the power of such analyses.

Figure 1: Effect of Omegaven on biochemical abnormalities of TPN-liver disease (mean values).



Conclusions: This case series highlight our early experience with omega-3 lipids such as Omegaven®, as a viable alternative to conventional lipid emulsions. A clear trend towards improvement of the biochemical abnormalities of TPN-associated liver disease was observed.

PARTICIPATION IN NUTRITIONDAY IN EUROPE 2008 & 2009 – AN AUSTRALIAN HOSPITAL'S EXPERIENCE

J. BAUER^{1,2}, M. BANNISTER^{1,2}, R. CROWHURST¹, S. DENMEADE¹, P. HORSLEY¹, J. MARTINEAU¹, C. MCDONALD¹, F. WILLER¹

1. Dept of Nutrition & Dietetics; Royal Children's Hospital, Brisbane, QLD, Australia; 2. Pharmacy Department; Royal Children's Hospital, Brisbane, QLD, Australia

Malnutrition is associated with increased morbidity and mortality. NutritionDay in Europe is an annual one day international cross-sectional benchmarking audit in hospitals. The aim is to improve patient safety and quality of care by raising awareness and increasing knowledge about disease related malnutrition. In 2008 & 2009, five wards of The Wesley Hospital participated (neurology, gynaecology, oncology, respiratory, cardiac). Data collection included staff level screening practices, patient's demographic data, diagnostic categories, recent weight loss, appetite changes, 24-hour intake, current diet and length of stay. Outcome after 30 days included length of stay, discharge destination and mortality. Hospital wards are benchmarked with similar wards from all participating hospitals. For example, the neurology ward (25 patients, 13 female, age 78 (29-96) y, BMI 24.9±4.5) was benchmarked with 38 international neurology units (701 patients, 326 female, 69 (918-98) y, 26.0±4.9). All data is analysed and reported from a central European site. One of the disadvantages of the international data set is that no specific nutrition assessment tool is used so that only risk factors for malnutrition are reported. In 2009, subjective global assessment was performed on all patients included at the hospital.

In conclusion, participation in nutritionDay increased the awareness and knowledge about malnutrition due to the degree of interprofessional collaboration required to collect data and presentation of results at hospital forums. The Department received the hospital's annual quality award in 2008.

ENTERAL NUTRITION MISCONNECTIONS IN NEW ZEALAND: A PILOT SURVEY

F. LI AND G. HARDY

School of Pharmacy, University of Auckland, New Zealand

Introduction: Enteral Nutrition (EN) misconconnections occur when an EN system is inadvertently connected with a non enteral system such as an intravenous catheter for Parenteral Nutrition (PN). In 2006, USA reported 8 deaths and one permanent loss of function from 9 EN misconconnections. Similar occurrences have been reported in the UK, but information in New Zealand (NZ) is limited. **Aims:** To survey health professionals on procedures for EN administration and investigate any misconception issues.

Methods: A 15 point questionnaire has been devised to survey all NZ district health boards (DHB) but was first evaluated in a pilot by pharmacists and dietitians in three DHB, with a potential patient population of one million (a quarter of the country) for the period January to December 2008.

Results: All respondents were aware of the potential for EN misconconnections but no formal guidelines or staff training programmes were in place. Only one incident was reported in which EN was administered via the patient's PN line using a male-male luer adaptor, instead of via the nasogastric tube. The patient survived with no immediate harm and was discharged. Design of luer connectors for EN and PN systems was criticised.

Conclusions: Health professionals recognised both human errors and design faults were contributing factors for EN misconconnections to occur. Manufacturers are investigating new designs and colour coding to minimise the risk. On the basis of this pilot data the establishment of practical guidelines and formal staff education programmes are most important. A national reporting system is also essential.

THE USE OF FISH OIL BASED FAT EMULSION IN THREE INFANTS WITH PARENTERAL NUTRITION ASSOCIATED LIVER DISEASE

FOX J¹, BANNISTER M¹, ROBINSON L²

1. Dept of Nutrition & Dietetics; Royal Children's Hospital, Brisbane, QLD, Australia; 2. Pharmacy Department; Royal Children's Hospital, Brisbane, QLD, Australia

Introduction: Long-term use of parenteral nutrition (PN) in paediatric patients can lead to Parenteral Nutrition Associated Liver Disease (PNALD), a potentially fatal condition. The condition manifests with elevations in serum aminotransferase, bilirubin, and alkaline phosphatase. It has been hypothesised that the substitution of a conventional intravenous fat emulsion with one containing primarily omega-3 fatty acids may be effective in the treatment of PNALD.

Methods: Data was collated from three infants with short bowel syndrome and PNALD who had received fish-oil based parenteral lipid as a rescue treatment in substitution for the standard soybean lipid based solution. The three infants were all receiving PN as their sole source of nutrition and 3g/kg/day of a 20% intravenous lipid (Clinoleic) before switching to the fish oil based 10% solution (Omegaven). The preparation was commenced as a 50% mixture of the two lipids with the Omegaven



titrated up to sole solution at maximum rate of 1g/kg/day. Blood counts, clotting profile and liver function tests were monitored at least weekly whilst on PN.

Results: All three infants displayed improvements in their liver function within one month of commencing on the Omegaven. Two of the infants had complete normalisation of their bilirubin levels and all three had normalisation of ALP levels two months post commencement. **Table 1** outlines full biochemistry of all three patients.

Table 1

Patient's Age		Pre and Post Omegaven biochemistry (reference ranges)				
		Bili (<20)	BiliD (<4)	ALP (82-383)	AST (<65)	ALT (<35)
1(F)	7 months (commencement)	109	60	478	385	261
	8 1/2 months	10	<4	319	95	82
2 (M)	3 months (commencement)	101	63	510	175	150
	6 months	76	47	367	286	185
3 (M)	3 months (commencement)	12	7	411	278	629
	4 months	8	<4	324	36	32

Conclusions: Further investigation is required but these findings help to support the hypothesis that the administration of fish-oil based lipid emulsion can delay, stop or reverse the progression of PNALD.

INVESTIGATION OF PARENTERAL NUTRITION (PN) DELIVERY PRACTICES WITH CONSENSUS PRACTICE GUIDELINES (CPG'S)

C. HALL¹, A. ALI¹, A. VIVANTI¹ AND B. DESBROW^{2,3}

1. Princess Alexandra Hospital, Woolloongabba, QLD, Australia; 2. School of Public Health, Griffith University, Gold Coast, QLD, Australia, 3 Research Centre for Clinical and Community Practice Innovation, Griffith University, Gold Coast, QLD, Australia

Objective: To determine PN delivery practices at a tertiary teaching hospital and compare with the previous audit (1999-2004) and the 2005 Queensland Health CPG's for the delivery of PN in adult hospitalised patients.

Methods: The study was a retrospective analysis of all patients receiving PN (except ICU) between 2005-2008. Variables included: the indication, type and duration of PN, treating unit, weight changes, biochemistry (Liver function tests, PO4, K, Mg) and catheter related sepsis. Short PN duration was defined as <7 days, based on CPG's.

Results: The current analysis included 480 PN patient episodes, 62% (298/480, p = 0.566) were male, and mean age was 57 (±17, p = 0.181), similar to the previous analysis. Median PN duration was 7 days (range 1 - 185), significantly less than the previous analysis (10 days, range 1 - 370, p = 0.011). Use of any Peripheral PN (PPN) increased by 11% (from 50/582 to 96/480, p <0.000). Duration of PN was short in 205/480 (43%) of patients, 25% (51/205) of these patients received PN for gastroparesis / ileus. Use of PN for pancreatitis decreased from 61/598 to 39/480, p = 0.287). Weight loss was insignificant in patients with complete weight data who weren't fluid overloaded (170/480, Median -150g range -14.5 to 15.9kg, p = 0.917).

Conclusion: The high incidence of short PN duration is likely to be influenced by increased PPN use, however suggests that some PN delivery may be avoided by adherence to guidelines. Weight was maintained over the PN course.

MORPHOLOGICAL AND FUNCTIONAL CHANGES IN THE COLON FOLLOWING SMALL BOWEL RESECTION

KL HEALEY¹, JE BINES^{1,3,4}, SL THOMAS¹, G WILSON^{2,4}, RG TAYLOR^{2,4}, M SOURIAL², AND PM PEREIRA-FANTINI¹

1. Murdoch Childrens Research Institute; 2. Depts of Surgery and 3. Gastroenterology and Clinical Nutrition, Royal Children's Hospital; 4. Dept of Paediatrics, University of Melbourne, Parkville, Australia

Introduction: Anecdotal evidence suggests the colon plays an important role following small bowel resection (SBR). However colonic changes have not previously been studied. The aim of this study was to characterise morphological and functional changes within the colon following massive small bowel resection, and elucidate the influence of diet complexity on adaptation.

Method: *Study 1:* 4-week old piglets underwent a 75% SBR or sham operation and studied at 2, 4 and 6 weeks post-operation to allow analysis of early and late adaptation responses. Piglets received a polymeric infant formula (PIF). *Study 2:* SBR piglets received an elemental formula and were studied at 6 weeks post-operation. Immunohistochemistry with specific cell markers was used to quantitate intestinal cell types and the total cell numbers. Changes in functional proteins (peptideYY [PYY], liver fatty acid binding protein [L-FABP] and trefoil factor 3) were measured by western blot.

Results: *Study 1:* An increase in total, apoptotic, enteroendocrine and goblet cells numbers occurred at all time points. Increase in enterocytes was noted at 2 weeks post-op, and proliferative cells at 6 weeks post-op. L-FABP expression was increased at 2 and 4 weeks post-op, and PYY was significantly increased at 6 weeks post-op (p<0.05). *Study 2:* A reduction in total, proliferative, apoptotic and enteroendocrine cell numbers, and a concurrent decrease in PYY expression were observed in SBR piglets fed an elemental formula compared with those fed PIF.

Conclusion: These findings indicate that early and late adaptation responses occur within the colon following SBR. Piglets fed an elemental diet exhibited hindered adaptation suggesting an effect of diet complexity on colonic adaptation.

SERUM 25-HYDROXY-VITAMIN D DEFICIENCY IS COMMON IN AUSTRALIAN CHILDREN WITH IBD

DAY AS, LEVIN AD, WADHERA V, LEACH ST, WOODHEAD HJ, MENDOZA-CRUZ C, LEMBERG DA

School of Women's and Children's Health, UNSW, and Departments of Gastroenterology and Endocrinology, Sydney Children's Hospital, Sydney, NSW, Australia; Department of Paediatrics, University of Otago, Christchurch, Christchurch, NZ

Background: Inflammatory bowel disease may be complicated by decreased bone density, with potential mechanisms including chronic gut inflammation and corticosteroid exposure. Vitamin D deficiency is a further contributory factor. This study examined serum 25-hydroxy-vitamin D levels (25OHD) in children with IBD managed in a multi-disciplinary clinic in Sydney, Australia.

Methods: Data from medical charts were obtained retrospectively. In addition to 25OHD measurement data was collected on; initial therapy utilised, demographic variables, current disease activity and inflammatory markers, disease location and duration, and lifetime steroid exposure. Severe 25OHD deficiency was defined as 25OHD < 38 nmol/l.

Results: 104 measurements of 25OHD over 2 years were available from 78 children with IBD. The mean serum 25OHD was 71.2 (SD±26.5) nmol/L with 25 (32%) children 25OHD deficient. Children with 25OHD deficiency did not differ to those with normal 25OHD in regards to age, gender, PCDAI, ESR, CRP,