

# **CAPGAN 2011**

**London**

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13. **Development of children who were malnourished in early age and participated in a psychosocial stimulation program; a follow-up study.** Jena D Hamadani, Fahmida Tofail, Fardina Mehrin, Afroza Hilaly, Shamima Shiraji, Syed N Huda, Sally M Grantham-McGregor
14. **The Use Of Brum1 Resequencing Microarray To Identify Mutations In Patients With Neonatal Cholestasis.** J. L. Hartley, C. Bruce, K. MaKay, R. M. Brown, U. Baumann, E. Sturm, B. Udd, P. Mckiernan, D. McMullen, J. Mansson, F. MacDonald, E. Maher, A. S. Knisely, C. Hendriksz, D. A. Kelly, P. Gissen
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17. **Predictor of convulsion in severe malnourished children.** Sayeeda Hug, Mohammod Jobayer Chisti, Mohammad Saiful Alam Bhuiyan, Jonathon Harvey Smith, Mark Arthur Charles Pietroni
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19. ***Clostridium difficile* Mediated Effects on Intestinal Epithelia .** Jafari, N.V., Allan, E., Vernay, B., Stabler, R.A., Wren, B.W., Bajaj-Elliott, M.
20. **Vitamin D supplementation: Midwives, Health Visitors and GP's have their say!** Jain, V, Raychaudhuri, R. Barry, W.
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28. **Multi-dimensional associations of under nutrition-and scope for optimum child feeding practice.** Sabuktagin Rahman, Tahmeed Ahmed, Ahmed Shafiqur Rahman, Abigail Beeson, Sheikh Shahed Rahman, Carlos Rojas
29. **Subtypes and intestinal-related and extraintestinal symptoms of irritable bowel syndrome in children.** Shaman Rajindrajith, Niranga Manjuri Devanarayana
30. **Micronutrient status and enteropathogens between breastfeeding and other feeding patterns in Bangladeshi children with acute diarrhea.** S.K.Roy, D. Sarker, W. Khatun, M. Khanam, S. K.Thakur
31. **Relative Risk of Non-accidental Deaths among Children by Their Nutritional Status in Rural Areas of Bangladesh.** S.K. Roy, Nurul Alam, Tahmeed Ahmed, David A. Sack, Mansura Khanam, Afroza Begum, Md. Fahim Hasan Ibne-e-Khair, Sabina Khan and Wajiha Khatun
32. **Determinants of inappropriate complementary feeding practices in infant and young children in Bangladesh: Secondary data analysis of Demographic Health Survey 2007.** S.K. Roy, Iqbal Kabir, Mansura Khanam, Kingsley E Agho, Seema Miharshahi, Michael J Dibley
33. **Ethnic diversity of Childhood Inflammatory Bowel Disease in Europe.** B K Sandhu, D. Basude, C H Spray, IBD working group of ESPGHAN

34. **'Vanishing Bowel' – a case of closed Gastroschisis.** S Sanka, R Heuschkel, G Noble-Jamieson
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37. **Determinants of 1st hour initiation of breastfeeding in infants attending the paediatric outpatient department of a semi-urban hospital in Bangladesh.** Farhana Sharmin, Khurshid Talukder, M. Q-K. Talukder, Iftia Jerin
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39. **Newborn breastfeeding behaviour immediately after delivery in a semi-urban hospital in Bangladesh.** K. Talukder, M.Q-K. Talukder, F Rahman, I Jerin, F Sharmin, M Sarker
40. **The impact of nutrition education on exclusive breastfeeding for positive nutritional outcome of low birth weight babies.** Saima Kamal Thakur, S.K.Roy, Kanta Paul
41. **Randomized controlled trial to assess the effect of psychosocial-stimulation on development of iron deficient anaemic and non-anaemic young children.** Fahmida Tofail, Jena D Hamadani, Fardina Mehrin, Debora Ridout, Syed N Huda, John Beard & Sally M Grantham-McGregor
42. **A randomized controlled trial of three different supplemental foods in the treatment of moderate acute malnutrition.** Indi Trehan, Lacey N. LaGrone, Gus J. Meuli, Ricky J. Wang, Kenneth Maleta, Mark J. Manary
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44. **Ileal intubation Audit.** Manjula Velayudhan, Arun Urs, Mike Thomson.

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# **Papers accepted for Oral Presentation**

## TOWARDS SAFE AND NUTRITIOUS FOOD FOR A FOOD SECURE AFRICA

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According to the World Food Summit (1996), “Food security exists when all people at all times have access to sufficient, safe and nutritious food to maintain a healthy and active life”. In many African countries, health problems associated with insufficient food intake and contaminated food are an ever increasing threat. Nutrition-related diseases and foodborne diseases contributes to the high burden of morbidity and mortality in the Region.

The consequences of food and nutrition insecurity include increased morbidity and mortality through reduced ability to resist infection. About 35% of under-five mortality is attributed to undernutrition. Each year, African children suffer an estimated five episodes of foodborne and waterborne diarrhoea. Million others are affected by foodborne or zoonotic diseases, many of which are fatal or lead to severe sequelae. In addition, children have impaired physical and intellectual development which is passed on through generations. When food is in short supply individuals are more concerned about satisfying hunger than the safety, foodborne disease outbreaks such as aflatoxicosis, pesticide poisoning from contaminated produce and seed grain with pesticides, konzo from consumption of high cyanide cassava. Compliance to taking of medicines including HIV/AIDS and TB medicines also is compromised. Overnutrition is also on the increase in the Region coupled with an increase in cardiovascular diseases and diabetes.

Factors contributing to food insecurity in the region include conflicts; agriculture policy, and food production-population imbalance; climate and environment; and poverty. Others are diseases and infections especially HIV/AIDS, TB and Malaria. Cultural factors like food taboos also limit the foods that are purchased and consumed by households.

Although access to a safe and healthy variety of food, as a fundamental human right, foodborne diseases and malnutrition still represent a considerable public health burden in the African Region. Only nine countries on the continent are on track to reach the MDG1 target of cutting hunger and malnutrition in half by 2015. Assuring safe food and ending malnutrition require decisive actions in several areas therefore a comprehensive, coherent and coordinated strategy is needed to make progress in achieving Millennium Development Goal 1 and thus accelerate the attainment of MDG 4, 5 and 6.

Several global and regional commitments to tackling the chronic food insecurity in the Region exist including *Achieving Sustainable Health Development in the African Region; Strategic Directions for WHO 2010-2015*; WHA63.3 on Advancing Food Safety Initiatives and

WHA63.23 on Infant and Young Child Nutrition; and *African Regional Nutritional Strategy and WHO Regional Food Safety Strategy* which together with the core functions of WHO form the basis for interventions.

The paper discusses the key interventions by the WHO in the African Region to reduce the high burden of malnutrition and foodborne diseases. It identifies some challenges and proposes ways forward.

## Session 1 – Free paper 2

### Length gain by food supplementation in moderately malnourished children in Bangladesh

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**Background:** It is important to identify the rationale of food supplementation when nutrition education has already been found effective in improving nutritional status of the children.

**Objective:** To compare effectiveness of nutrition education with and without food supplementation in improving the physical growth of moderately malnourished children.

**Methodology:** In a prospective trial, 282 children of 6-24 months of age were randomized to one of the two intervention groups and one control group. Mothers of one intervention group received intensive nutrition education (INE) on food security, disease control and caring practices twice in a week; while those of the second group received the same nutrition education and in addition their children received food supplementation (INE-FS) prepared from local foods providing 300 kcal/day for six days a week. The control group received the usual nutrition education from the routine services of Bangladesh Integrated Nutrition Program (BINP). The intervention continued for 3 months and all of the children were followed up for the following 3 months.

**Results:** The children receiving food-supplementation and nutrition education (INE-FS) achieved significantly greater length compared to the other intervention group INE and the control group both after intervention and after observation ( $p < 0.001$ ). The children in nutrition education group (INE) gained weight only but showed no improvements in length. However, the difference in weight gain between the intervention groups was not significant.

**Conclusion and Discussion:** The results suggest that food supplementation produces greater benefits than only intensive nutrition education as it caused improvement in both weight and height of the moderately malnourished children.

**Acknowledgements:** ICDDR,B, BINP and World Bank.

### **Marsh Criteria in Tropical settings- How relevant?**

Mukesh Yadav, Abhijit, KK Kalra , Ranjana Gondal\* and SKMittal

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**OBJECTIVE-** To evaluate modified Marsh criteria of histology of duodenal biopsy for diagnosis of celiac disease in Indian children.

**STUDY DESIGN-**Prospective case control study. The children (1 to 12 yrs) undergoing upper GI endoscopy for evaluation for various GI conditions were recruited for study. These children were divided in to 3 groups.

**Group 1** Children on gluten containing diet having one or more of typical clinical features suggestive of celiac disease and raised anti ttGA level >20 IU/dl.

**Group 2** Children, also on Gluten containing diet and with clinical features suggestive of celiac disease as in group 1 but with anti ttGA level < 20 IU/dl. and normal serum total IgA levels.

**Group 3** Children who were undergoing upper GI endoscopy for diseases other than suspected celiac disease and having anti ttGA < 20IU/dl and normal serum total IgA levels. They were considered as controls for this study.

**SETTINGS-**Medical College Associated teaching hospital in Delhi

**CASE MATERIAL** We recruited 74 cases in the present study in which clinical symptoms were suggestive of celiac disease. 42 (Gr 1) of these were serum anti ttG A positive (>20IU/dl) and 32 (Gr 2) were serum anti ttG A negative (<20IU/dl). Another 37 children (Gr 3) with no clinical features suggestive of Celiac disease and also with anti ttG A –ve ,but undergoing Upper GI endoscopy for other indications (Hematemesis/ hepatosplenomegaly/RAP etc) were recruited as controls.

Duodenal biopsies obtained were evaluated using modified Marsh Criteria. The Pathologist reviewing the histopathology was not aware of the clinical grouping.

### **RESULTS**

There were no difference in the prevalence of various clinical features and their severity in two groups showing that it is not possible to differentiate between gluten enteropathy and other causes other causes of chronic diarrhea on clinical grounds alone. Considerable overlap was seen between different grades of modified Marsh histology and the clinical groups While 5 (11.9%) of 42 children with serological and clinical celiac had Marsh 0 , as many as 7 (17.9%) of the 37 “control “group” had abnormal Marsh grading out of which 3 had even Marsh Gr 3 (a or b) grade. Similarly, as many as, 10(31.17%) of 32 serologically negative cases of chronic diarrhea cases (clinically resembling celiac), had abnormal Marsh grading.

### **CONCLUSIONS**

Marsh grading of duodenal histology cannot be used in isolation for the diagnosis of celiac disease in tropical settings. A comprehensive clinical, serological and histopathological evaluation is a must before making the diagnosis of this disease which requires life long withdrawal of gluten containing staple foods from children’s diet.

### Clinical Characterization Of Eosinophilic Esophagitis In The Maltese Islands

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**Background:** Eosinophilic esophagitis (EE) is increasingly recognized in paediatric and adult patients with varied upper gastrointestinal symptoms that overlap with gastroesophageal reflux disease (GERD).

**Objective:** The aim was to study the clinical presentation, endoscopic-histopathologic findings and response to therapy of subjects with EE presenting to our referral centre over the span of 14 months.

**Methods:** The study was based on a prospective clinical database tracking endoscopy findings at our institution (MDH). This was queried for indication and endoscopic findings and cross referenced with histopathologic findings (esophageal biopsy) through additional electronic database and manual chart review. Chart review further characterized pre-endoscopic clinical findings including atopy, other co-morbidities as well as outcomes in subjects with EE. Subjects aged less than 18 years undergoing endoscopy with biopsy (TMA) were included. The study was vetted by our Institutional Ethical Review process.

**Results:** During the period 8/09 - 10/10, 132 individuals (68F) mean age (SD) 9.7 (5.2) years underwent upper endoscopy with esophageal biopsies at our institution. The indication for endoscopy was abdominal pain, dyspepsia or dysphagia in 63 subjects (48%); in 4 individuals (6%) classic endoscopic (furrowing, nodularity) stigmata of (moderately severe) eosinophilic esophagitis were present and correlated with histopathologic findings of EE upon biopsy. All individuals with EE had been treated with acid suppression for 1 month or more pre-endoscopy. None of our patients had significant atopy. Two of the four patients with EE had neurodisability co-morbidity; the relative risk of EE upon EGD was 5.2 in neurodisabled compared with non-neurodisabled children. In one subject (excluded from the study) presenting with abdominal pain and weight loss, typical heavy eosinophilic infiltration of the esophagus was diagnosed in otherwise classic Crohn's Disease elsewhere. Post endoscopy all patients were treated by: 1. Intensified acid suppression, 2. Escalating strict exclusion diet (SFED), 3. Ingested – (inhaled) steroid (fluticasone). Symptomatic improvement 3/4, (resolution of symptoms 2/4) was evident within 2 weeks – 1.5 months after initiation of therapy. In one patient persistent symptoms were present with poor compliance to the dietary modification component of therapy and persistent changes of EE were noted on repeat endoscopy.

**Conclusion:** EE is a relatively uncommon finding even in a select population of pediatric patients undergoing routine upper endoscopy in a referral population. Although children with neurodisability have significant predisposing factors for GERD and dysmotility, EE appears disproportionately represented in our patients with neurodisability.

**Acknowledgements:** Thanks to the pediatric, pathology and endoscopy departments at Mater Dei Hospital for their continuing hard work and dedication.

**Efficacy of single intravenous Iron Dextran infusion in children with IBD who are resistant to oral iron therapy.**

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**Background:** Anaemia is a frequent finding in children with Inflammatory Bowel Disease (IBD). Iron deficiency is at least in part responsible for this and hence iron supplementation is an important part of the management of patients with IBD. Oral iron is safe and inexpensive and is usually the preferred treatment for iron deficiency anaemia. However, it has been shown to be less effective in active IBD, when intravenous iron therapy can lead to rapid replenishment of iron stores in otherwise resistant cases of iron deficiency anaemia. Parenteral iron therapy is less often used because of the potential side effects. There is only limited evidence in children with IBD on the use of parenteral iron therapy.

**Aim:** To retrospectively review efficacy and safety of single dose intravenous iron dextran infusions in children with IBD.

**Materials & Methods:** A complete list of children with IBD aged 13y (range 5-17y) who received intravenous iron dextran infusion was obtained from the department of Pharmacy and departmental diary. Electronic medical records and hospital electronic results reviewing system (e-MR/ Web -OCS) were used to gather diagnostic and haematological information pre-infusion (median 4m (2-10m), at time of infusion and post-infusion (median 3m (1-12m). Staff administering the infusions were interviewed and electronic discharge letters reviewed to identify any side-effects. All children had either failed to respond to oral Fe supplementation for a median of 8 weeks (1-12 weeks), or been intolerant to oral iron supplements. Results were then charted and analysed.

**Results:** = 11 patients (4 females), total number of infusions 11

	Pre-infusion	At infusion	Post infusion	Δ pre-infusion v. Δ post-infusion (p value)
Hb	10.5 (8.4-12.1)	10.2 (8.2-12.4)	12.2 (11-13.7)	0.56
MCV	70.7(67-77.3)	70.75 (64-83.5)	81.2 (72.2-82.6)	0.25
Serum Iron	3.3(1.6-5.2)	3.2 (2.3-5.1)	7.5 (2.9-12.4)	0.11
Ferritin	9.85(4.1-73)	7.2 (<1 – 32.5)	80.5 (30.7-116.9)	<0.0001
% iron saturation	5.5(3-36)	5 (3-11)	18 (9-23)	0.002

All results show median (range)

**Discussion:**

Iron deficiency anaemia is a common problem in children with IBD. There is only limited experience in the use of systemic iron supplementation in children with IBD. This small retrospective review of patients shows that a single IV iron dextran infusion can be safe and efficacious for children with IBD who fail to respond to oral Fe supplementation.

**Successful management of long-term intestinal failure in Malta.**

Dr V. Merceica<sup>1</sup>, Attard T<sup>2</sup>, Attard-Montalto S<sup>2</sup>, Hill S<sup>3</sup>.

Gozo Hospital, Gozo <sup>1</sup>, Mater Dei Hospital, Malta <sup>2</sup>, GreatOrmond Street Hospital, London<sup>3</sup>.

**Background:** The best chance of long-term survival for children with incurable intestinal failure is to continue treatment with intravenous/parenteral nutrition (PN) at home. However, only certain countries have the facilities to manufacture bespoke PN.

**Objective:** To review the outcome of children with chronic, severe intestinal failure treated with bespoke PN imported from another country.

**Methodology:** All children who have been discharged home in Malta on treatment with PN were reviewed. Age, sex, underlying diagnosis, time on PN and outcome were all reviewed. Deliveries of bespoke PN were 2-weekly. The PN was infused over-night and the child was free to lead a normal life during the day. Parents had under-gone a formal home PN training programme in a specialist unit in the UK to administer treatment. The specialist centre's guidelines were followed for management of complications e.g. sepsis.

**Results:** Twelve children, 9 male, and three female now aged from 3-24 years were discharged home on PN treatment from 3-22 years ago. The underlying diagnosis was enteropathy in 10 and short gut following surgical resection in two cases with gastroschisis. Overall survival rate was 75% with three deaths from 10 months-5 years after discharge (two gastroschisis, one enteropathy). One-year survival rate was 91% (11 of 12), two-year survival was 83% (10 of 12), 5-year survival was 80% (8 of 10) and 10-year was 77% (7 of 9). 20-year survival rate was 100% (4 cases). Two children gained full enteral autonomy aged 16 years and thrived. Seven children are still on treatment.

**Discussion and Conclusion:** Children with severe incurable intestinal failure have a good chance of long-term survival into adult life if parents are formally trained to administer PN over-night. Home PN can be a successful form of treatment that should be considered even in remote communities.

## Management of Enteropathy in Severe Acute Malnutrition

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### Abstract:

Diarrhoea is a frequent complication of children presenting to hospital with severe acute malnutrition. Both biopsy and permeability studies have documented abnormalities of the small intestinal mucosa, including partial villus atrophy with crypt hyperplasia, villous stunting, and high numbers of intraepithelial lymphocytes; reduced absorptive capacity with loss of mucosal disaccharidases; and abnormal barrier function due to tight junction dysfunction. This enteropathy complicates the early dietary management of severe malnutrition, particularly due to carbohydrate intolerance (e.g. lactose intolerance) and in HIV-exposed infants. Nevertheless, current protocols still recommend the use of lactose-containing formulas such as F75, which has 13g/L of lactose, an osmolality of 333mOsmol/kg, 0.9g/100mL of protein and only 75kcal (315kJ)/100mL – not a very gut-friendly or nutritious diet for these infants.

Most of these children also have an underlying environmental enteropathy prior to the onset of diarrhoea, which may have contributed to their growth failure. There is increasing interest in ‘gut trophic nutrients’ to repair the mucosa. Two such nutrients are already recommended in the treatment of malnutrition, namely zinc and vitamin A. Other agents such as probiotics and non-absorbable antibiotics (e.g. rifaximin) are also often used, although evidence of a clear benefit is lacking in malnutrition. However, novel agents such as glutamine, arginine, nucleotides, prebiotics, and growth factors have been reported as potentially gut-protective. This presentation will discuss the evidence of a benefit from these novel agents on gut repair mechanisms.

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**ENTERIC VACCINE DEVELOPMENT – MIXED FORTUNES**

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Safe, effective and potentially affordable vaccines are available for rotavirus, typhoid and cholera. Vaccines for norovirus, shigella, ETEC, non-typhoidal salmonella, campylobacter and other enteric infections are at various stages of development. Decisions on whether vaccines are incorporated into National Immunisation Programmes (NIP) are complex but uptake of the currently available enteric vaccines has been slower than anticipated. A McKinsey & Co report for the World Bank and Gates Foundation concluded decision-makers need the following to support the use of a new vaccine in a NIP: proof of local disease burden; proof of a safe and effective vaccine; convincing health economics; limited negative effect on existing vaccines; support from clinical opinion leaders; no concerns raised by general practitioners and parents; and ideally funding from external sources. Rotavirus vaccine offers greatest promise with potential to prevent 527,000 annual deaths (2004 data). Regional Rotavirus Surveillance Networks have systematically collected disease burden data with a World Health Organization (WHO) generic protocol. The safety and efficacy of Rotateq® and Rotarix™ vaccines have been documented in both developed and developing countries and economic evaluations have been conducted to derive “break-even” prices and cost-effectiveness data. In June 2009 WHO recommended the inclusion of rotavirus vaccination of infants into all NIPs. Yet as of June 2011, only 28 countries have implemented this recommendation. Accumulating data indicates that early adopters of rotavirus vaccines have seen very significant reductions in childhood diarrhoeal disease morbidity and mortality. Despite the availability of comprehensive data purportedly needed by decision-makers, many governments, particularly in the Asian region, appear less than enthusiastic about these vaccines. It seems surprising that public health officials have not been more proactive to support an intervention that could be potentially cost-saving or highly cost-effective (assuming a competitive tender price). It is speculated that this lack of enthusiasm could be due to a number of reasons including variability of regional advocacy for vaccination programmes, location of the initial vaccine studies, poorly functioning National Immunization Technical Advisory Groups, perception that rotavirus is a mild disease, concern that frontline clinic staff will resist the introduction of yet another new vaccine, and the impact on private practitioners if an “income-generating” vaccine were to be provided free-of-charge through the public sector. Advocates for typhoid and cholera vaccines are facing similar barriers. Hopefully recent funding pledges and renewed impetus generated by “The Decade of Vaccines” will enable rotavirus and other enteric vaccines to achieve their full potential.

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**Collaboration of nutritional intake & probiotic executors in infants; responsibility for a lifetime?**

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There is emerging evidence linking modern lifestyle with changes in the colonizing microbiota in early life, with influences of the latter on the developing immune system and hence with the risk of immunoallergic diseases and even obesity. Probiotics are “live organisms, which when consumed in adequate amounts confer a health benefit on the host”. As such they offer potential in regard to conditions such as, gastroenteritis, day-care infections, allergy, premature infant necrotizing enterocolitis (NEC)/sepsis as well as in prevention of auto-immune disorders, with implications for developing economies as well as the developed.

Two recent systematic reviews have presented evidence based on a variety of probiotic combinations (added together) on reduction in NEC and all -cause -mortality in infants in a variety of settings. Results from one strain cannot be extrapolated to another but there is limited human data proving this. One of the trial products(Solgar Infant Probiotic Powder) was evaluated by our ProPrems group with respect to colonization and immune –modulator properties with consistent results. Product factors of reliability; strain-subtype, registry at tissue bank, the supply chain, the ability to test for quality and contamination in batches will remain concerning until pharmacological standards are mandated. In the developed world nurseries, probiotics may become supplementary to conventional therapy (the highest standards of care including use of fresh breastmilk), with the dilemma for the clinician as to whether the benefits outweigh the risks in his/her own population statistics (over time, and allowing for NEC clusters). Clinicians recommending a probiotic should apply the same principles and standards that apply to other forms of therapeutics, understanding the specificity and stacking up the strain-specific data from adequately powered randomized controlled trials including our study. In the developing world there is clear potential to protect “at-risk” infants at potentially lower cost from sepsis while continuing to support breast feeding and nutritional programmes. It may also be implicated in the prevention of the emerging epidemic of chronic diseases/malignancy over a lifetime, even once the sepsis/NEC risk window has passed, with alterations in autoimmune disease risk possible as well as other infective-immune-related disorders/dyplasias. Longitudinal studies are warranted in both settlings.

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### **Advocating for child health through breastfeeding protection**

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**Background:** The Interagency Group on Breastfeeding Monitoring (IGBM) is a UK-based coalition of international NGOs, churches, academic institutions and interested individuals whose role is to gather good quality information about the state of the “International Code of Marketing of Breast-milk Substitutes” (Code), and national legislation where such exists, compliance using its Protocol and act as a focal point for ensuring that the information gathered is useful for decision makers and advocates. Advocating for child health and welfare through protection of breastfeeding by promoting compliance with the Code is an effective way to prevent ill health and deaths in young children. IGBM’s most recent project was designed and implemented as a contribution to this global goal.

**Objective:** The purpose of IGBM’s ‘Monitoring Compliance with the International Code of Marketing of Breast-milk Substitutes in Africa’ Project was to obtain data for Code monitoring from selected countries while building national capacity to undertake Code monitoring, support national stakeholders in the use of the compliance data and advocate at an international level for child health and welfare through recognition of Code monitoring as a relevant indicator of child health and welfare.

**Methodology:** To test a null hypothesis of no violations of the Code in Uganda (Kampala) and Botswana (Gaborone), a cross sectional multi-stage cluster sampling survey was carried out in August-September 2004 and April-June 2005, respectively by interviewing pregnant women, mothers of infants under six months of age and health workers across sampled health facilities in the two cities, and public domain advertising and labelling of products under the scope of the Code was assessed in retail shops and pharmacies in the neighbourhoods of the sampled areas.

**Results:** Twenty health facilities in Gaborone and twelve in Kampala were visited. Eight hundred and fourteen women were interviewed in Gaborone and 850 in Kampala. One hundred and twenty nine health workers were interviewed in Gaborone and 125 in Kampala. Nineteen shops and pharmacies were visited in Gaborone and 42 in Kampala.

The study revealed violations of the Code in both settings. Major areas included those relating to advertisements of products under the scope of the Code in the public domain and labelling of these products, together undermining the message: “Breast is best”. Few violations were found in terms of what has been seen in the past as the more direct and

aggressive advertising, i.e. provision of samples of products to women and health workers.

IGBM built capacity and provided the project countries with the tools necessary to continue Code monitoring work.

**Conclusion:** Breastfeeding is best, in almost all circumstances, and must be protected. Successful implementation of, and monitoring compliance with, the only international tool specifically designed to protect breastfeeding, is one of the effective ways to strive towards *prevention* of ill health in children and is a priority for reduction of child morbidity and mortality. Mainstreaming of the IGBM tools into national monitoring systems, and ultimately contributing to better Code compliance, could lead to achievement of considerable health gains. IGBM has handed over ownership of its Protocol to UNICEF's Nutrition Unit in New York. By responsibility being taken at such high level for ongoing use of the tool for continued global monitoring by UNICEF local offices, the Protocol has the potential to contribute a key component to UNICEF's infant and young child feeding programmes at country level.

**Acknowledgements:** The IGBM Project was a collaborative effort undertaken by the Interagency Group on Breastfeeding Monitoring (IGBM), as the main coordinating and implementing agency, with the Ministries of Health, UNICEF, WHO and other national stakeholders in Uganda and Botswana. The Project's Steering Group provided technical support and guidance throughout the course of the work. Funding was provided by Comic Relief and Parthenon Trust, and UNICEF UK served as the hosting organisation.

**Impact of cessation of neonatal breast feeding period on the clinical signs of pneumonia and hypoxemia in young infants attending an urban diarrhea treatment centre in Bangladesh**

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**Background:** Among the 8.8 million global deaths in under-five children in 2008, 33% deaths occurred from pneumonia and diarrhea. Death is more frequent when children with pneumonia also present with hypoxemia. Continuation of breast feeding for an infant up to at least 6 months of age has paramount importance for the achievement of adequate immunity against pneumonia. However, we do not have any published data on the impact of cessation of breast feeding on hypoxemia in early infancy.

**Objective:** To evaluate the impact of neonatal cessation of breast feeding on clinical features of pneumonia and hypoxemia in infants aged 0-6 months admitted with diarrhea in the Special Care Ward (SCW) of the Dhaka Hospital of ICDDR,B, Bangladesh.

**Methodology:** We prospectively enrolled all the diarrheal infants (n=107) aged 0 to 6 months with WHO-defined as well as radiological pneumonia admitted in the SCW during September 2007 through December 2007. Comparison was made between breast-fed (n=73) and non-breast-fed infants (n=34).

**Results:** Compared to the breast-fed infants, non-breast-fed infants more often remained hypoxemic after receiving O<sub>2</sub> supplementation [12.0 (0.0, 21.75) vs. 0.0 (0.0, 12.0); p = 0.021]. After adjusting with potential confounders such as inability to drink, fever, head nodding, cyanosis, grunting respiration, and lower chest wall indrawing, the non-breast-fed infants who presented with pneumonia and diarrhea had a higher incidence of cough (OR 9.09; CI 1.34 - 61.71; p = 0.024), hypoxemia (OR 3.32; CI 1.23 - 8.93; p = 0.017), and undernutrition (OR 3.42; CI 1.29 - 9.12; p = 0.014).

**Conclusion:** Our data suggest that the cessation of breast feeding may substantially increase the incidence and duration of hypoxemia as well as incidence of cough and severe malnutrition in young infants presenting with pneumonia and diarrhea which re-emphasizes the paramount importance of the continuation of breast feeding in early infancy.

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**Factors affecting healthcare consultation in children with chronic constipation: a school based survey**

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**Background:** Constipation is a common pediatric disorder. To date, there are no community-based studies to detect healthcare consultation among affected children, and the factors determining it.

**Objective:** To identify factors determining healthcare consultation in Sri Lankan children with chronic constipation.

**Methodology:** A cross sectional survey was conducted among 10-16 years old children. Five schools were randomly selected from 3 randomly selected provinces of Sri Lanka. From each school, children were randomly selected from academic years (grades) 6-11. Previously validated questionnaire based on Rome III criteria was used in the survey and questions were included regarding healthcare seeking for constipation. Questionnaire was administered in examination setting to ensure confidentiality and privacy. Constipation was diagnosed using Rome III criteria. A child who had consulted a doctor during previous 12 months for symptoms of constipation was considered as a healthcare consulter.

**Results:** Of the 2270 questionnaires distributed, 2694 (97.3%) properly filled questionnaires were included in the analysis. Four hundred and sixteen (15.4%) children had chronic constipation. Of them, only 16 (3.8%) had sought medical advice during previous 12 months. Healthcare consultation was significantly associated with age less than 12 years, history of constipation among first degree relatives, low stool frequency (less than 3 per week), presence of faecal incontinence, stool with-holding posture, blood stained stools and vomiting ( $p < 0.05$ , chi-square test). There was no such association with sex, social class and exposure to stressful life events ( $p > 0.05$ ).

**Discussion and Conclusions:** In Sri Lankan children, healthcare seeking for chronic constipation (3.8%) is surprisingly low. However, younger children, those with family history of constipation and symptoms of severe constipation such as faecal incontinence, are more likely to seek medical advice than others. Parents should pay more attention to bowel habits of their children, to identify and treat constipation early, in order to prevent long-term complications.

**Range Of NICU Practice In England And Wales Regarding Thresholds For Neonatal Conjugated Hyperbilirubinaemia And Relevant Investigations**

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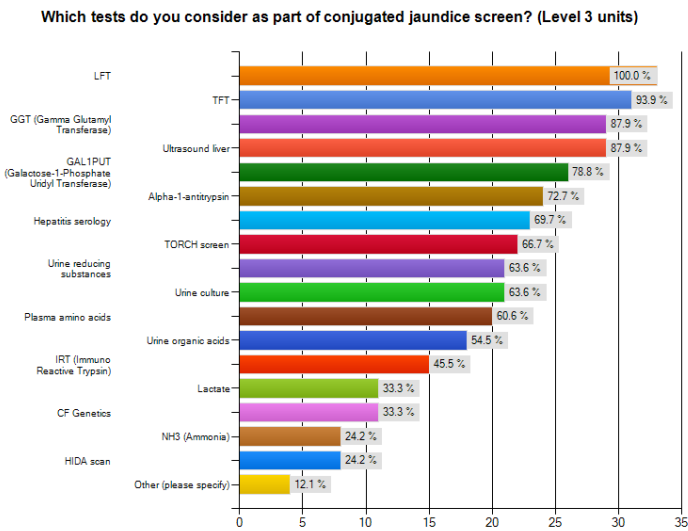
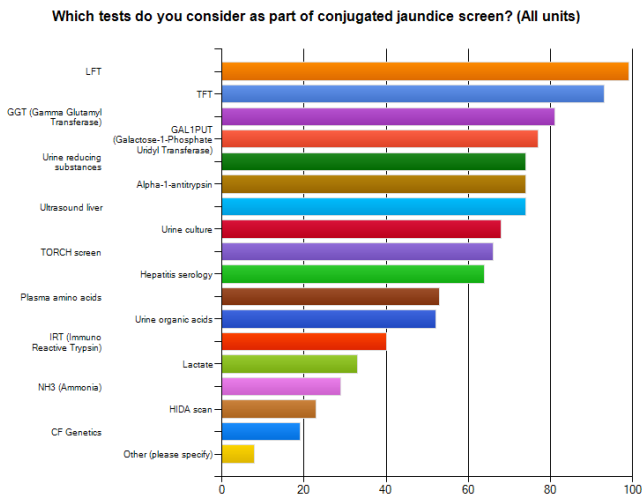
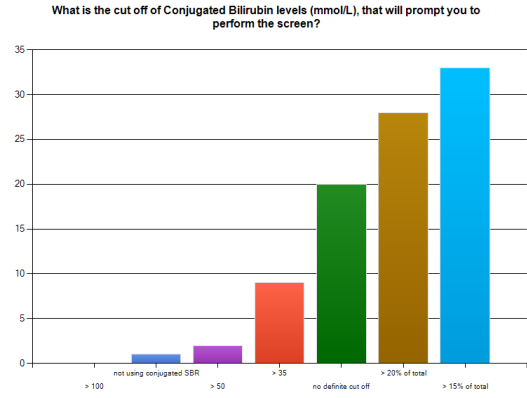
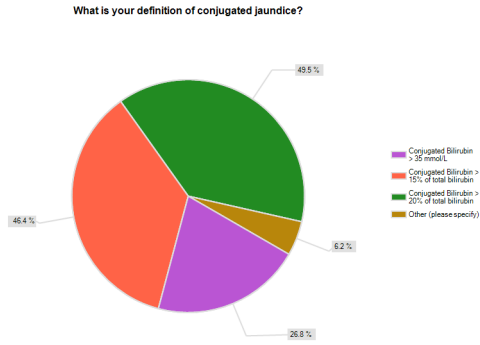
**Background:** Conjugated jaundice is a common problem in NICU .Several investigations are performed to exclude underlying liver disease. Opinion differs on diagnostic value of such investigations.

**Objective:** To evaluate practice related to investigation of conjugated jaundice in neonatal units across England and Wales.

**Methodology :** Questionnaire survey of lead neonatal consultants from all neonatal units in England and Wales. Questions included definition of conjugated jaundice, bilirubin cut off that prompted investigations and tests performed. Clinicians were also requested to give their opinion on the yield from these investigations.

**Results:** 102/194 neonatal units (52%), responded to the survey of which 33 were level 3 units, 50 level 2 and 19 level 1 units. 96 units (94%) performed conjugated jaundice screen and 6 units (6 %) did not. 77 units (75%) had a written policy. 49% of responders defined conjugated jaundice as conjugated bilirubin >20% of total bilirubin and 46% as >15% of total bilirubin and 5% of units did not have a clear definition. Conjugated bilirubin levels that prompted investigations varied between units with 28 (30%) using conjugated bilirubin >20% of total, 33(36%) a conjugated bilirubin >15% of total and 20 (21%) with no definite threshold. Majority (>76%) of units performed liver and thyroid function tests, Galactosaemia screen,  $\alpha_1$  antitrypsin and liver ultrasound. In addition to above investigations, 65% of units performed urine culture and hepatitis serology, 32% performed urine organic acids, NH<sub>3</sub> and lactate. 19 units performed CF genetics and 23 HIDA scan. 71% of responders (which included 2 out of 3 neonatal units with in-house paediatric hepatology services) thought ‘diagnostic yield’ from these tests were ‘poor’ and 44% based this on their personal view, 29% on local data and 27% on anecdotal evidence.

**Conclusion:** Our study identified a wide variation in definition and investigation of neonatal conjugated jaundice. National guidelines are required to standardize practice.



**Auto-immune Sclerosing Cholangitis (ASC) in children with inflammatory bowel disease (IBD)**

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**Introduction/ Background:** Primary sclerosing cholangitis (PSC) is a chronic progressive disorder characterised by chronic inflammation and stricture formation of the biliary tree. It occurs in 2-5% of adult patients. Response to immunosuppressive treatment is poor and the long term risks for colorectal cancer, cholangio-carcinoma and risk of liver transplantation are increased significantly. In contrast, paediatric patients often have auto-immune features at presentation and respond well to immunosuppression. It is important to confirm the diagnosis by liver biopsy before starting immunosuppressive treatment for colitis, as optimal management of PSC requires additional therapy. Maintenance drug treatment and follow up schedules differ for patients with IBD complicated by ASC.

**Aim and Subjects/ Methods:** A retrospective review of nine patients with a histological diagnosis of auto-immune sclerosing cholangitis (ASC) or auto-immune hepatitis (AIH)/ASC overlap syndrome at Addenbrookes NHS Trust between 2002 and 2010.

Nine (5.4%) out of 147 children with IBD were diagnosed with ASC or AIH/ASC overlap syndrome over the 8 year period. Eight of the nine children presented with colitic symptoms while in one child the diarrhoea had settled but liver function tests (LFT's) remained abnormal. The Gamma glutamyl transpeptidase (GGT) was the most sensitive liver function test with all nine children having abnormal values ranging from more than 3 x to 8 x normal. Further blood tests showed auto-immune features including an elevated total IgG and positive auto-antibodies in all children. All 9 children underwent upper and lower endoscopy and percutaneous liver biopsy under one general anaesthetic (Table 1).

All 9 patients in our series receive maintenance treatment for their PSC with ursodeoxycholic acid and prednisolone 5mg/day and are in remission 6 to 93 months from diagnosis.

Table 1:

Patient	1	2	3	4	5	6	7	8	9
Liver Histology	ASC	ASC	ASC	AIH/ASC	AIH/ASC	ASC	ASC	AIH/ASC	AIH/ASC
Fibrosis	mild	mild	severe	severe	mild	mild	mild	severe	mild
MRCP	N	AB	N	AB	AB	AB	AB	AB	AB
IBD diagnosis	UC	UC	UC	UC	UC	UC	UC	UC	UC

N= normal result; AB= abnormal result showing biliary tree changes consistent with ASC  
UC= ulcerative colitis; MRCP= MR-cholangiopancreatography

**Conclusion:**

We recommend that all children with colitic symptoms, who undergo endoscopy for suspected IBD, require liver function tests including GGT at presentation. If there is elevation in either transaminases or GGT, the patient should ideally undergo a liver biopsy at the time of endoscopy to confirm the diagnosis of suspected ASC. Blood test investigations most strongly associated with ASC were an elevated GGT and a positive auto-antibody screen (ANA, anti-smooth muscle, anti-LKM or p-ANCA). Once the histological diagnosis of cholangiopathy is confirmed, MRCP can distinguish between large and small duct ASC.

## **High Burden of Childhood Rickets in Bangladesh: The First National Prevalence Survey of Mineral deficiency**

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**Background:** Rickets is among the most-frequent childhood diseases in many developing countries which is a condition of softening of bones in children, potentially leading to fractures and deformity. The National Rickets Prevalence Survey was conducted to explore the prevalence of rickets assuming that, in addition to determining the overall prevalence and determination of biochemical markers in patients with clinical rickets, the survey would help identify the factors associated with rickets.

**Objective:** To estimate the first national survey of rickets among children aged 1-15 years with their nutritional status and biochemical profiles.

**Methodology:** Twenty thousand children aged 1-15 years were randomly selected from 6 divisions of Bangladesh. Clinical diagnostic signs, radiological signs of active rickets, and anthropometric measurements (weight, height, and mid-upper arm-circumference) were recorded by direct observation. Blood samples were tested for biochemical markers.

**Results:** Rickets was found in every division of Bangladesh. A total of 197 rachitic cases were diagnosed with a prevalence rate of 0.99%. Radiologically, 24% were at active phase, 34% were in growing phase, and 42% were not in active phase. The prevalence of severe stunting, underweight, and wasting were 53%, 40% and 1.4% respectively. About 98% of the children were vitamin D-deficient, and 48% were calcium-deficient. Dietary factors were significantly related with rachitic children.

**Discussion and conclusion:** The results of the first-ever national rickets survey estimated that about 550,000 children aged 1-15 years have been suffering from rickets in Bangladesh, who need urgent attention for treatment and prevention. An appropriate policy for treatment and prevention formulation is strongly recommended.

**Acknowledgements:** Successful completion of the National Rickets Survey was possible for the financial and technical support from UNICEF, CARE, NNP, BRAC, and Plan Bangladesh.

**Physical Activity and Energy Intake in Rural South African Children and Adolescents**

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**Background**

The origins of obesity appear simple – excess energy intake and/or low energy expended on physical activity, leading to chronic energy imbalance. Most studies on childhood obesity aetiology have focused on developed countries; there are few data on the characterisation or contribution of risk factors for child obesity from low-middle income countries.

**Objective**

To characterise physical activity, sedentary behaviour and diet in rural South African children, aged 7-15 years.

**Methodology** 7 days of objectively measured physical activity and sedentary behaviour using accelerometers (Actigraph GT3X) and two separate dietary assessments (24 hour dietary recall), were conducted in 150 children (50 at 7, 11 and 15 years). Ethics Approval granted by University of KwaZulu-Natal, Biomedical Research Ethics Committee.

**Results** Accelerometry Data

Sex	Age 7 years		Age 11 years		Age 15 years	
	Male	Female	Male	Female	Male	Female
Total (N)	15	11	19	14	13	17
Single count per minute (cpm) Median (IQR)	1017.2 (835.1-1191)	873.6 (842.5-1206.3)	786.4 (694.6 - 871.9)	619.4 (583.3- 778.2)	665.9 (398.6 – 775.5)	484.7 (400.6 – 536.6)
% Sedentary (% SED) Median (IQR)	50.7 (44.9 –56.9)	56.1 (44– 60.2)	61.4 (54.7-67.8)	71.2 (62.6-74.9)	66.2 (60.4-82.3)	75.8 (71.6 -80.3)
% Light Median (IQR)	45.7 (42.5-53.2)	43 (38.4-50.6)	37.3 (31.1–42)	28.2 (24–34.5)	32.8 (17.3–38.1)	24 (19.3 –26.8)
% Moderate/Vigorous Physical Activity (% MVPA) Median (IQR)	1.7 (1.2–3.6)	1.5 (1 – 4.6)	1.3 (0.8 –1.8)	0.9 (0.4 – 1.3)	0.6 (0.2 –1.4)	0.2 (0.1 – 0.8)
Approx minutes MVPA daily	12	11	10	6	4	1

Physical activity, displayed by single cpm, decreased with age in males and females; females had a lower cpm than males in each age group. % SED increased with age, whilst % MVPA decreased in both sexes.

### Dietary Data

	Age 7 years		Age 11 years		Age 15 years	
Sex	Males	Females	Males	Females	Males	Females
Total (N)	16	14	20	22	18	27
Energy kJ Median (IQR)	6640.5 (5965.2 - 7913)	6584.3 (4812.4- 7840.6)	8247.2 (7061.8 – 9069.5)	7096 (5789.5- 8099.3)	7207.6 (4999.6 – 9082.3)	7071.9 (5773.5- 8355)
Energy kcal Median (IQR)	1586 (1424.8 - 1890)	1572.6 (1149.4- 1872.7)	1969.8 (1686.7- 2166.2)	1694.9 (1382.8- 1934.5)	1721.5 (1194.1 – 2169.3)	1689.1 (1379- 1995.6)

Both median and upper quartile energy intakes were below the Recommended Daily Allowance (RDA) for all specified age groups, males and females.

#### **Discussion and Conclusion**

Children demonstrated high volumes of activity but at low intensity (low levels of MVPA), with substantially lower MVPA than the 60 minutes/day which is recommended internationally. Dietary energy intake was below RDA for all ages. Future interventions to prevent obesity should not ignore the contribution of physical activity, even in rural African children.

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**The reliability of MUAC among infants younger than 6 months in rural Kenya<sup>1</sup>**

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**Introduction:** Worldwide, 8.5 million infants under 6 months old are wasted. The Mid Upper Arm Circumference (MUAC) is a simple, affordable tool that has high inter-observer reliability and predictive value in older age groups and might potentially be used for detection of wasting among infants under 6 months old; however, its reliability and accuracy in this age group is unknown.

**Objective:** To assess the reliability of MUAC and other anthropometric indices among infants aged under 6 months performed by trained health professionals (HP) and minimally-trained community health workers (CHW) in Kilifi District, Kenya.

**Methods:** A cross-sectional repeatability study estimated reliability and accuracy of measurements undertaken by an expert anthropometrist and HPs (nurses, public health technicians). Following training, 18 CHWs (3 at each of the 6 sites) repeatedly measured MUAC, weight and length of infants aged under 6 months. Intra class correlations (ICC) and the Pitman's statistic were calculated.

**Results:** Among the 18 CHWs, the ICC for MUAC pooled across the 6 sites (924 infants) was 0.960 (95% CI 0.951 to 0.964) and for WFLz was 0.710 (95% CI 0.681 to 0.740). MUAC measures by CHWs differed little from their trainers: the mean difference in MUAC was 0.65mm (95% CI 0.023 to 1.07), with no significant difference in variance (P=0.075).

**Conclusion:** MUAC is reliably and accurately measured by minimally-trained CHWs among infants aged under 6 months. With appropriate cut off values, MUAC could be used for community-based screening of younger infants at risk of wasting.

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**Efficacy of community-based follow-up care with/without food supplementation and/or psychosocial stimulation in the management of children with moderate acute malnutrition in Bangladesh.**

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**Background:** Moderate acute malnutrition (MAM) [WLZ: <-2 to -3] is a major health problem in Bangladesh and other low-income countries. Improved methods of management of children with MAM are required.

**Objective:** To assess the effect of community-based follow up care, with or without food supplementation and/or psychosocial stimulation, as an alternative to current hospital-based follow-up care of children with MAM. Methods: 227 children with MAM aged 6-24 months hospitalized at ICDDR,B (in Dhaka, Bangladesh) were randomly assigned to one of the following regimens once they recovered from diarrhea and/or other illnesses: 1) fortnightly follow-up care at the ICDDR,B Hospital, including growth monitoring, health education, and micronutrient supplementation (Group H-C, n=49); 2) fortnightly follow-up at community follow-up unit (CNFU) [CNFUs were established in the existing primary health care centers close to the residence of the child] using the same treatment regimen as Group H-C (Group C-C, n=53); 3) community-based follow up as per Group C-C plus cereal-based supplementary food (SF) (Group C-SF, n=49); 4) follow up as per Group C-C plus psychosocial stimulation (PS) (Group C-PS, n=43); or 5) follow up as per Group C-C plus both SF and PS (Group C-SF+PS, n=33).

**Results:** There were no significant differences in baseline characteristics by treatment group. Attendance at scheduled follow-up visits was greater in Groups C-SF, C-SF+PS, and C-PS than C-C and H-C;  $P < 0.05$ . Rates of weight gain were greater in Groups C-SF+PS, C-SF, and C-PS (0.83 to 0.95 kg) compared with Groups C-C and H-C (0.60-0.69 kg over 3-month),  $P < 0.05$ . Rate of length gain was similarly higher among the children followed in the community. Children in the H-C group more often (significantly) suffered from diarrhea and fever than other groups. Children who attended at least five of the total six scheduled follow-up visits gained more in weight, length than those who attended fewer.

**Conclusions:** Positioning follow-up services in the community increases follow-up visits and promotes greater linear growth; providing SF, with or without PS, increases clinic attendance and enhances nutritional recovery. Community-based service delivery, especially including supplementary food, permits better rehabilitation of greater numbers of children with MAM.

**Breast milk zinc transfer to appropriate-for-gestational-age (aga) and small-for-gestational-age (sga) bangladeshi infants: studies of milk volume, using deuterium dose-to-mother technique, and milk zinc concentrations**

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**Background:** There is limited information on: 1) the concentration of zinc in breast milk of mothers in developing countries at different times post-partum; 2) the total amount of zinc transferred through breast milk to infants of different ages in these settings; and 3) whether zinc transfer from mother to infant differs among appropriate-for-gestational-age (AGA) and small-for-gestational-age (SGA) infants.

**Objectives:** 1) To measure breast milk and zinc transfer from mothers to infants, by “dose-to-mother” technique using deuterium oxide, in mothers of AGA and SGA infants. 2) To measure the breast milk zinc content and serum zinc both in the mother and infant.

**Methods:** We studied breast milk transfer using deuterium “dose-to-mother” and milk zinc concentration of 73 mother-infant pairs (33 AGA, 40 SGA) at 4, 12 and 24 wks postpartum. In each round, 30g deuterium was given orally to the mother following baseline blood and saliva collection from mothers and infants. Subsequent saliva samples were obtained on d 1, 2, 3, 4, 13, and 14 from infants and d 1, 2, 13 and 14 from mothers. Breast milk zinc concentration was measured at baseline and d 4 in each round.

**Results:** Breast milk intake increased significantly with infant age (643± 190; 756±150; 804±150 g/d at 4, 12 and 24 wks, respectively; p=0.000), and differed by birth weight (BW) groups only at 4 wks post-partum (AGA=714±193 vs SGA=579±164 g/d; p=0.005). Milk zinc concentration decreased significantly from 2.46 mg/L at 4 wks to 1.02 mg/L at 24 wks (p=0.000), but did not differ by group at any time point. Zinc transfer through breast milk declined significantly with infant age (1.60±0.62; 1.08±0.41; 0.81±0.32 mg/d at 4, 12 and 24 wks respectively; p=0.000), but did not differ by group.

**Conclusions:** Milk zinc concentrations and total milk zinc transfer of Bangladeshi mothers are consistent with published data, and do not differ for mothers of AGA and SGA infants.

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**Including antibiotics as part of the treatment for severe acute malnutrition reduces the case-fatality rate by half**

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**Background:** Severe acute malnutrition (SAM) contributes to 1 million child deaths annually. It is unclear if empiric antibiotics decrease mortality and failure rates for children treated as outpatients for SAM.

**Objective:** To test the effect of empiric oral antibiotics on mortality and recovery rates for children treated as outpatients for SAM.

**Methodology:** This prospective, randomized, double-blind trial in Malawi enrolled children 6-59 months old with SAM, defined as a weight-for-height Z-score (WHZ) < -3 (marasmus) and/or bilateral pitting pedal edema (kwashiorkor). Participants received 1 week of amoxicillin 80-90 mg/kg/d (AMX), cefdinir 14 mg/kg/d (CEF), or placebo (PL), in addition to 175 kcal/kg/d of RUTF and followed at 2-week intervals for up to 12 weeks. The primary outcomes were the rates of death and recovery from SAM. Secondary outcomes included growth rates and time to graduation. Chi-square and ANOVA compared outcomes between different medication groups. Ethical approval was obtained from Washington University and the University of Malawi.

**Results:** Among 2775 children (2190 with kwashiorkor, 585 with marasmus), the overall recovery rate for children who received antibiotics was significantly better than those who received placebo (AMX 89.0%, CEF 91.4%, PL 85.1%,  $p < 0.0002$ ). This result was consistent among both children with kwashiorkor (AMX 91.6%, CEF 92.9%, PL 88.3%,  $p < 0.007$ ) and marasmus (AMX 78.9%, CEF 85.1%, PL 73.7%,  $p < 0.03$ ). The mortality rate was also significantly less among children receiving antibiotics (AMX 4.63%, CEF 3.86%, PL 7.48%,  $p < 0.002$ ) and in the population with kwashiorkor (AMX 3.49%, CEF 3.56%, PL 7.27%,  $p < 0.0006$ ), but not in those with marasmus.

**Discussion and Conclusion:** The addition of an empiric oral antibiotic to the outpatient therapy of SAM with RUTF reduces the failure rate and case-fatality rates by approximately half. Standard case management of SAM should include oral antibiotics in addition to RUTF.

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**Incidence of malnutrition in children admitted to a tertiary paediatric hospital.**

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**Background:** Several studies have reported significant numbers of malnourished children in hospital.

**Objective:** The aim of this study was to identify the incidence of malnutrition in children presenting to a tertiary hospital on admission, and whether nutritional status changed by the time of discharge.

**Methodology:** On a screening week 141 children, mean 2.4 ( range: birth-17) years who were inpatients for  $\geq 72$  hours were included and followed until discharge (or for up to 90 days if still an in-patient). On admission and discharge weight and length/ height were also recorded. Weight for age Standard Deviation (SD) was used to define malnutrition.

**Results:** Median hospitalisation was 22 (range:3-209) days The overall incidence of malnutrition on admission was 45% (14.2% moderate and 12.8% severe malnutrition) according to the weight SD and increased to 49% by the time of discharge (11.3% moderate and 21.3% severe malnutrition). Most cases of malnutrition were seen in children aged less than 2 years, inpatients for more than one month and those with multiple medical problems with an incidence of malnutrition between 53 and 67%. In 41% height was never measured during the whole admission.

**Discussion:** Hospital malnutrition is still a major problem with an incidence of 45% on admission and 49% at discharge. Nutritional care should be focussed on children aged less than two years, in-patients for over a month and those with multiple medical problems.

**Conclusion:** The risk of nutritional depletion needs to be identified at admission, and appropriate nutritional intervention initiated with the aim of minimising any deterioration and improving nutritional state.

**Inpatient feeding for children with complicated Severe Acute Malnutrition (SAM): audit of Ready-to-Use Food vs. F100 milk in transition phase**

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**Background**

Treating children with SAM comprises two phases: ‘stabilization’ and ‘rehabilitation’, often with a ‘transition’ in-between. World Health Organization guidelines for inpatient feeding suggest F100 milk following stabilization with F75 milk. Current treatments focus on ‘Community Management of Acute Malnutrition’ using Ready-to-Use Therapeutic Foods (RUTF). However, complicated SAM still requires initial inpatient care. To minimise length of stay and prepare children for home RUTF, some guidelines suggest ‘early-RUTF’ instead of F100 transition.

**Objective**

To explore whether “early RUTF” for inpatient treatment of complicated malnutrition is safe and effective.

**Methodology**

Audit of routine data from an urban feeding centre in Blantyre, Malawi. In April 2006, F100-based protocols were modified to ‘early RUTF’. Prospective data was collected from July 2006-March 2007 (within an unrelated study showing no overall effect). Outcomes were compared with July 2005-March 2006 retrospective data on historical controls.

**Results**

In 2005/6, 224/1173(19.1%) children died as inpatients: 110/224(49.1%) during stabilization phase. Of 999 making it to F100-based transition feeds and beyond, 114/999(11.4%) died.

In 2006/7, 238/1024(23.2%) died; 106/238(44.5%) during stabilization. Of 875 making it to RUTF-based transition and beyond, 132/876(15.1%) died.

Logistic regression adjusted for admission age, weight-for-height, oedema, HIV, oedema, and time on stabilization phase. Inpatient deaths were greater using “early RUTF”: adjusted odds ratio(aOR) 1.76(95%CI 1.30-2.39, p<0.001). Stabilization duration did not affect mortality: aOR 1.06(95%CI 0.99-1.13, p=0.08)

Mean inpatient stay reduced from 9.0 to 8.2 days(p=0.003). Total stay reduced from 10,482 to 8,258 bed-days.

**Discussion and Conclusions**

Despite significant advantages minimizing inpatient stay, further work is needed to explore “early RUTF” treatment strategies for complicated SAM. It is important to recognise major limitations of observational study designs such as this: high risk of unknown confounding and bias e.g. from better data capture during the early RUTF period. More data and future intervention trials are needed.

(298 words)

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- COMREC (College of Medicine Research of Ethics Committee – approving publication of this audit of data from a changes to routine practice)

**Abstracts accepted for  
Poster Presentations**

(in alphabetical order, 1<sup>st</sup> Author)

**UK experience of treatment of chronic viral hepatitis C in children and adolescents: Predictors of viral response and quality of life**

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**Background:** DoH funds the 3 supra-regional liver units in the UK to treat children and adolescents with chronic hepatitis C (HCV).

**Objectives:** To review efficacy, tolerability and quality of life (QoL) in children with (HCV) treated with pegylated interferon (PEG-IFN) alfa and ribavirin in the 3 centres.

**Methods:** Demographic, laboratory and clinical outcome data on children up to 18 years of age treated for HCV were reviewed. Information gathered from QoL questionnaires (CHQ-PF28) completed by parents during their children's treatment was also available for one of the centers. Sustained viral response (SVR) was defined as undetectable HCV RNA at 24 weeks following end of treatment.

**Results:** The study sample comprised 75 children; 38 were males. The median age at starting treatment was 10 years (3.0-17.2 years). The most common mode of infection (83%) was via vertical transmission. 34 patients were Genotype 1 (G1); 39 Genotype 2&3 (G2&3); 2 Genotype 4 (G4). SVR was achieved in 76%; 62% G1; 89% G 2&3; 100% G 4. Younger children had higher SVR compared to older age groups, however this was not statistically significant  $p=0.7$ . Low viral load at the start of the treatment ( $<500,000$  IU/mL) did not have significant effect on viral response  $p=0.5$ . Liver biopsy results were available in 57; 17 had no evidence of fibrosis, 32 had mild fibrosis (METAVIR score of F1) and 8 had moderate to severe fibrosis (F2&F3). The degree of fibrosis did not affect SVR rate. Early viral response (EVR) at 12 weeks of treatment was achieved in 53 and sustained in 47 (89%). Data on rapid viral response (RVR) at 4 weeks of treatment were available in 25; 17/25 (68%) achieved (RVR) which was sustained in 16 (94%). There was no significant change in the z scores for weight and height from start of treatment compared to 24 weeks post treatment follow-up ( $p$  0.2 and 0.5 respectively). Data on QoL were available for 31 children and their families. Treatment had significant impact on QoL during the initial 12 weeks of treatment compared to overall treatment duration. There were no serious side effects reported and none discontinued treatment due to side effects.

**Conclusion:** HCV treatment with (PEG-IFN) and ribavirin is well tolerated by children with minimal negative impact on the quality of life and no significant effect on growth. EVR and RVR are good predictors of treatment response.

**Acknowledgement:** I would like to acknowledge Jaswant Sira, Tulpesh Patel and Henry Gowen for their contribution and help.

**Poster 2**

## **Cow's Milk Allergy (CMA) and Intolerance (CMI) – a District General Hospital Experience**

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### **Background**

Cow's milk allergy (CMA) and intolerance (CMI) are common conditions suffered by 2-6% of infants. However, the range of symptoms is diverse with diagnosis based on clinical judgement and dietary exclusion trials. This study was undertaken to clarify these issues.

### **Objective**

To determine the presenting symptoms, management and outcome of a cohort of patients with Cow's milk allergy or intolerance presenting at the Royal Shrewsbury Hospital, UK with a view to designing an appropriate care pathway.

### **Methodology**

A retrospective study of all children referred to the paediatric dietician with a suspected diagnosis of CMA or CMI between 1<sup>st</sup> January 2008 and 30<sup>th</sup> April 2009 at the Royal Shrewsbury Hospital, UK. Relevant data was extracted from the case notes, recorded on a standard proforma and input into a Microsoft Excel XP database by a single researcher.

### **Results**

The cohort of 90 children ranged from 2 weeks to 9 years (mean age 1.36 years). Almost half were less than 6 months old. Diarrhoea (62%) and vomiting/reflux (33%) were the commonest symptoms. Constipation (19%) was a significant symptom while colic (28%) and irritability (18%) were other prominent symptoms. Although non-specific rashes were noted in 21%, eczema (7%), wheeze (4%) and anaphylaxis (15) were rare as was blood (9%) or mucus (6%) in the stools.

69% showed a complete resolution of symptoms with dietary exclusion of cow's milk while 22% responded partially. 76% of the partial or non-responders responded fully to a second dietary intervention. Only 1 of the original 90 children remained fully symptomatic. Overall, an extensively hydrolysed formula was fully effective in 72% and an amino acid based formula in 92%.

## **Discussion & Conclusion**

Although diarrhoea and vomiting are common symptoms in CMA and CMI, early constipation should prompt consideration of this diagnosis. Anaphylaxis is rare. Clinical suspicion combined with appropriate dietary exclusion appears a valid way of making a diagnosis.

**Poster 3**

## **Prognostic Factors for Persistent Abdominal Pain in Children with Functional Gastrointestinal Disorder**

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**Background:** Functional gastrointestinal disorder (FGID) with persistent abdominal pain can have significant impact on a child's life. There is a lack of consensus regarding the factors influencing the disease course.

**Objectives:** The aim of the study was to examine the effect of patient characteristics on the persistence of abdominal pain in children with FGID.

**Methodology:** Medical records of children with FGID and abdominal pain who attended paediatric gastroenterology practice from 2006 to 2009 were reviewed. Patients who had at least one follow-up visit within first 6 months and subsequent visits at 1 year or later from the initial presentation were included in the study. Main outcome measure was persistence of abdominal pain without improvement (symptomatic status). Descriptive analyses are presented as proportions for categorical data. Bivariate comparison for categorical data was done using Fisher's exact test.

**Results:** Of the 93 patients 71 were females (76%). The mean age was  $11.3 \pm 3.2$  (range 4-18) years. Presentation was categorized as mild (20%), moderate (61%), or severe (19%). Patient characteristics recorded were non-gastrointestinal somatic symptoms (31%), psychiatric co-morbidity (19%), vomiting (28%), nausea (58%), diarrhea (26%), constipation (18%), disruption of daily functioning (43%), family history of gastrointestinal disorders (59%), parental divorce (34%), and obesity (18%). Improvement was noted in 46% patients during the first 6 months and 67% patients at 1 year or later. Patients with symptom of nausea at presentation were more likely to remain symptomatic beyond 1 year (42% vs. 22%,  $p=0.04$ ). Symptomatic patients during the first 6 months of follow-up who received tricyclic antidepressants (TCAs) were more

likely to be asymptomatic or better during follow-up visits at 1 year or later (19/25 vs. 10/25,  $p=0.02$ ).

**Conclusion:** Symptom of nausea at presentation is associated with long-term persistence of abdominal pain. Early institution of TCAs may improve outcome in these patients.

#### Poster 4

### LONG TERM OUTCOME IN CHILDREN WITH INFLAMMATORY BOWEL DISEASE (IBD).

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**Background:** There is very limited published data on long term outcome of IBD in children.

**Aims:** To document current long term outcome of paediatric IBD.

**Methodology:** Prospective database of newly diagnosed paediatric IBD has been maintained at single regional centre in UK covering 5.2 million population. 241 cases were diagnosed between 1993-2003 including 58 local cases whose adult care continued locally. Their prospective data at diagnosis and subsequent progress have been analysed.

**Results:** Average follow up was 8.6 years (range 5-15). The mean age at diagnosis was 12.74 years. 50 % (29) had Crohn's disease (CD) and 40 % (23) Ulcerative colitis (UC). 45% (11CD 15UC) were treated with steroids, 36 % (21) with exclusive enteral feeds and 19 % (11) with 5 Aminosalicylates. Time to first relapse after enteral feeds was 9.1m and steroids 11.4m. Average relapse rate was 0.4/year for both. In steroid treated 23 % (6/26) became steroid dependent and 7.5 % (2/26) steroid resistant. Growth failure occurred in 13.7% and correlated with steroid dependence. Bone mineral density was reduced in 14% (8/58) and correlated with Asian origin, steroid dependence and disease activity. Azothiaprime treatment reduced bone disease by 25% and growth failure by 15%. 30% CD and UC patients required surgery; rates correlated with disease activity and steroid dependence. 6/26 CD patients' required terminal ileal (TI) resection. Their time to relapse was 21.3m (8-36).

**Conclusions and Discussion:** Time to first relapse after enteral therapy v steroids was 9.1m v 11.4 m but with similar rates of subsequent relapse (0.4/year). 30% of children required surgery within 5 – 15 years of diagnosis; rates were similar for CD and UC and

correlated with disease activity and steroid dependence. Time to relapse post TI resection was 21.3m. Steroid dependence was common (23%). Treatment with Azathioprine reduced risk of bone disease and growth failure.

## Poster 5

### Effect of genotyping on the severity of rotavirus gastroenteritis

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**Background:** Rotavirus is the commonest cause of paediatric gastroenteritis. There remains a controversy regarding disease severity being related to rotavirus genotype G9.

**Objective:** Study the genotype related severity of rotavirus gastroenteritis.

**Methodology:** Clinical information and faecal specimens of children under five years admitted with acute diarrhoea at the Colombo North Teaching Hospital were collected from April 2005- October 2008. Faecal specimens were tested and genotyped for rotavirus using the ELISA kit, Rotaclone® (Meridian Diagnostics, Cincinnati) and reverse transcription (RT) PCR respectively. Severity of gastroenteritis was assessed using the 20 point scoring system of Vesikari and Ruuska.

**Results:** Hundred and seventy eight (21.8%) of 813 specimens positive for group A rotavirus were genotyped. The two predominant VP7 genotypes were G9 (76; 42.7%) and G1 (35; 19.7%) followed by G2 (22; 12.4%), G3 (22; 12.4%), G12 (18; 10.1%) and G4 (4; 2.2%) respectively. The mean severity scores of, G1, G2, G3, G4, G9 and G12 were 12, 12, 12, 14, 13 and 13, respectively. Comparison of clinical features between the two common G types, G9 and G1 revealed the following; duration of diarrhoea was longer among G9 (mean 4±2 days) than G1 (mean 2 ±1 day) and a higher percentage of cases were febrile and had vomiting in G9 (84.9 and 86.3 respectively) than G1 (76.7 and 65.5 respectively) infections ( $p > 0.05$ ). The rest of the clinical features were similar. The percentage with severe disease (score ≥ 14) was higher among the G9 (38.4) than among G1 (26.7) infections ( $p > 0.05$ ).

**Discussion and Conclusions:** Although rotavirus G9 genotype was associated with a more severe gastroenteritis than the common G1 genotype, this association was not significant. This study failed to show a difference in severity of symptoms between patients infected with G9 and G1 genotypes.

## **eLearning as a solution to train doctors and nurses to manage malnutrition in children**

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**Background:** Many children die unnecessarily from malnutrition. Inadequate knowledge and competency of health professionals limit its effective management. A solution to develop the capacity in malnutrition management is to provide health professionals with standardised and accessible training.

**Objective:** The IMTF and Faculty of Medicine eLearning teams at the University of Southampton have developed an eLearning course called “Caring for infants and children with severe malnutrition”. By completing this course the user will gain the core knowledge and competencies required for the care and management of severe acute malnutrition.

**Methodology:** In collaboration with the Uganda Paediatric Association (UPA) and Makerere Medical School, a study was conducted in Uganda in December 2010 to evaluate the effectiveness of the course and appropriateness of its delivery. Using pre- and post- tests and questionnaires, observation, individual interviews, individual diaries and focus groups, the participants’ experience during the study were investigated. Eighty six, comprised of doctors, final year medical students, nurses, midwife trainees and nutritionists, took part in three half-days training and 80 completed it in full.

**Results:** The course was well received for its design and delivery. Participants’ knowledge improved significantly between the pre- and post-test total scores (mean difference = 29.7, 99%CI, 26.9 to 32.5,  $p < 0.001$ ). Understanding of and competency in the definition, classification, assessment and management of malnutrition also improved (16 participants with good understanding to 66 and 9 being competent to 65 respectively).

**Discussion & Conclusions:** The study findings showed that by completing the eLearning course participants acquired the core knowledge and competencies required for malnutrition management. eLearning can provide standardised and accessible training for malnutrition management in both developed and developing countries.

**Acknowledgement:** The team would like to thank the University of Southampton, IMTF, Royal College of Paediatric and Child Health), WHO, UPA, Makerere Medical School and participants.

Poster 7

**Disease severity, etiology and nutritional status of underfive children visiting Kumudini Hospital, Mirzapur, Bangladesh. [<mailto:gfaruque@icddr.org>]**

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**Background:** Initial observations of an etiologic and disease burden study in infants and young children with moderate-to-severe disease have indicated *Shigella* and rotavirus as the leading pathogens in rural Bangladesh. However, there is lack of evidence based etiologic and diarrheal disease burden studies in children with mild disease. We undertook a study to identify the microbiologic etiology (*V. cholerae*, *Shigella*, ETEC, and rotavirus) of patients hospitalized (in-patient, moderate-to-severe disease and dysentery) and visiting (out-patient, mild disease and dysentery) rural Kumudini Hospital, Mirzapur, Bangladesh.

**Aims and Objectives:** The study aimed to evaluate the disease severity, etiology and nutritional status of children among 0-59 months of age living in demographic surveillance system (DSS) area of Mirzapur sub-district.

**Methodology:** We establish a round the clock diarrheal disease surveillance system in Kumudini Hospital, Mirzapur by collecting information on demographic, epidemiological and clinical characteristics of patients included into the surveillance system. Using structured questions we collected information on socioeconomic and demographic characteristics, housing and environmental conditions, feeding practices particularly of infants and young children (0-35 months old), and use of drugs and fluid therapy at home. Information on clinical characteristics, nutritional status, and treatments received at the facility, and outcome of treatments also recorded.

**Results:** During January to December, 2010 among under five 1040 children, 45% (n=469) presented with moderate to severe disease while 55% (n=571) had mild disease. *Shigella* was frequently (32%) isolated among children with moderate-to-severe disease while rotavirus was predominant (44%) among children with mild disease. Children with moderate to severe disease were significantly more underweight (29% vs. 17%, p<0.001), stunted (21% vs. 13%, p<0.001) and wasted (20% vs. 12%, p<0.001) than children with mild disease.

**Conclusion:** Children with moderate-to-severe disease or shigellosis require appropriate antibiotic and nutritional management during hospitalization.

Poster 8

### **Perception of Caregivers on Pathology of Childhood Diarrhea**

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**Introduction:** Diarrheal diseases are the fifth leading cause of death in the under-five population in Bangladesh, mostly affecting those from lower socio-economic levels. Caregivers' perception plays an important role in ensuring health and health care-seeking behavior.

**Objectives:** To explore caregivers' knowledge and perception on pathological factors concerning diarrhea in young (<3 years of age) children, from lower socio-economic population.

**Methodology:** Qualitative data were collected through focus group discussions and in-depth interviews of family caregivers and health professionals. Information was obtained from a total of 104 caregivers (all female and mostly mothers of patients) and seven health professionals. The study took place at Dhaka Hospital, ICDDR,B, Dhaka.

**Results:** Most respondents expressed that their perception on diarrhea was often superfluous. Local nosology of diarrhea varied from place to place, and did not necessarily match medical classifications. Loose motion as the symptom of diarrhea was universally recognized. However, most caregivers failed to recognize critical signs of dehydration. Most of them could identify one or more scientific factors responsible for diarrhea, including environmental factors and introducing new foods to a child etc. Nevertheless, further interviewing revealed that many respondents had deep-rooted beliefs on supernatural forces (*'nojoor laga'*, *'chokh laga'*, *'batash laga'* etc.; indicating 'evil eye' or 'bad spirit') causing diarrhea. A Mother would sometimes be blamed by her in-laws or husband for her 'immoral' lifestyle, for illness episodes in children, especially if she was a nursing mother. Most caregivers failed to recognize their inappropriate hygiene practices as a basic cause of diarrhea. We observed visible dirt on their hands and clothes in many cases.

**Discussion and Conclusion:** Perception on such a common childhood illness as diarrhea is often wrong and misleading due to deep-rooted beliefs and cultural practices. Accurate knowledge on diarrhea-related dehydration, including hygiene practices, is crucial for

prevention and management. Appropriate counseling needs to be designed to help improve caregivers' knowledge, attitude and practice.

**Acknowledgements:** We wish to thank ICDDR, B for letting us conduct the study in the hospital. We are especially indebted to our respondents.

## Poster 9

### Perception of caregivers on feeding and nutrition during childhood diarrhea in Bangladesh

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**Introduction:** Diarrheal diseases are the fifth leading cause of death in the under-five population in Bangladesh, mostly affecting those from lower socio-economic levels. Caregivers' perception plays an important role in ensuring health and health care-seeking behavior.

**Objectives:** To explore caregivers' perception on nutrition and feeding patterns, and its impact during diarrheal episodes in young (<3 years of age) children, from lower socio-economic population.

**Methodology:** Qualitative data were collected through focus group discussions and in-depth interviews of family caregivers and health professionals. Information was obtained from a total of 104 caregivers (all female and mostly mothers of patients) and seven health professionals. The study took place at Dhaka Hospital, ICDDR,B, Dhaka.

**Results:** Practice of breastfeeding *exclusively* for six months is absent in most cases. We found that three basic causes of infant patients being deprived of breastmilk existed: disease-induced anorexia, reluctance of mothers to feed a fidgeting child, and, to a lesser extent, from the misconception that '*consumption of milk aggravates diarrhea*'. Caregivers we interviewed had adequate knowledge on basic nutrition. Yet, cultural practices and deep-rooted beliefs such as reliance on expensive foods (infant formula, meat, fish, costly fruits etc) and belief in '*supernatural spirits cause diarrhea*' were even stronger in many caregivers, which they could not overcome. Mother and child were sometimes forced by their relatives to avoid certain '*forbidden*' foods, often pushing them to semi-starvation. Generally fish and other high-protein foods for the mother, and

milk and all complimentary foods for the child were considered to aggravate diarrhea. Caregivers had mixed and confused idea on ideal consistency of patient's diet, and its importance in nutrition during illness. However, hospital counseling helped some caregivers overcome prejudices.

**Discussion and Conclusion:** Feeding practices during illness episodes do not necessarily conform to knowledge due to deep-rooted beliefs and cultural practices. Appropriate, comprehensive counseling would help improve caregivers' knowledge, attitude and practice.

**Acknowledgement:** We wish to thank ICDDR, B for letting us conduct the study in the hospital.

## Poster 10

### ***Shigella*: a disease of poverty and Aborigines in Western Australia between 1997 and 2007**

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**Background:** The epidemiology in Australia of *Shigella*, a virulent gram-negative organism responsible for severe dysenteric illness is poorly understood

**Objective:** To report prevalence, geographic, racial and social distribution of *Shigella* infections in Western Australia (population 1.96 million in 2006) between 1997 and 2007.

**Methodology:** Data obtained from the Western Australian Department of Health Communicable Diseases notification system was analysed for the period January 1, 1997 to December 31, 2007. Each notification includes postcode, age and race (Aboriginal, non-Aboriginal and unspecified). Postcode data was linked to the Australian Bureau of Statistics Socio-Economic Index of Financial Advantage (SEIFA) to generate an index of social disadvantage for each individual. Data was analysed using SPSS. A subgroup of patients identified at the Princess Margaret Hospital (PMH) had stool culture and antibiotic sensitivity results available. ANOVA was used to determine statistical significance of numeric differences.

**Results :** 1414 cases were notified. Annual notifications varied between 224 in 1997 and 79 in 2001. 47.9% (677) notifications were of Aboriginal Australians, 32.8 % (464) were non-Aboriginal and 19.3% (273) unspecified race 15% of notifications were in each of the first and the second years of life, and overall 54.3% of notifications were in the paediatric age range (0-19 years). The SEIFA index for Aboriginal notifications was 882.3±149.7, for non-Aboriginals 992.±90.1, unknown 929.9±138.0 (p <0.0001), both less than the Australian mean SEIFA of 1006 (2006).

100 patients were identified at PMH (70 Aboriginal). 53 of the stool cultures identified *S.flexneri* and 43 *S.sonnei*. 95% of isolates were sensitive to nalidixic acid, ciprofloxacin and cefotaxime. Resistance to amoxicillin, amoxicillin + clavulanic acid, trimethoprim, + sulfamethoxazole varied from 10-98%.

**Conclusions:** Shigellosis in Western Australia is a disease of young children, of Aboriginal Australians and of social disadvantage. Most isolates remain sensitive to nalidixic acid, ciprofloxacin and cefotaxime.

**Poster 11**

### **Prevalence of Over/Under-nutrition in Rural South African Children and Adolescents**

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**Background :** The World Health Organization estimates that 42 million children worldwide aged <5 years are overweight and highlights tackling childhood obesity as an urgent priority. Childhood obesity is rising to epidemic proportions in the developing world, adding a significant public health burden to countries where under-nutrition remains common. There is limited evidence on obesity prevalence in rural populations in low-middle income countries.

**Objective:** To determine the prevalence of underweight and overweight/obesity in children and adolescents (aged 7-15 years) in a rural African population with a high HIV prevalence and a background of under-nutrition.

**Methodology:** Cross-sectional study of 1,500 children (500 at 7, 11 and 15 years) conducted in local schools within the large Africa Centre Demographic Surveillance

Area, northern KwaZulu-Natal. Body Mass Index, Body Fat % (using Tanita) and Mid-Upper Arm Circumference were measured on each child.

Prevalence of under/overnutrition was defined by BMI-for-age (using both World Health Organization and International Obesity Task Force cut-offs), Weight-for-Age (Centers for Disease Control and Prevention) and % body fat, age/gender specific cut-offs (Jebb 2004).

Ethics Approval granted by University of KwaZulu-Natal, Biomedical Research Ethics Committee.

## Results:

### Anthropometry

Sex	Age 7 years		Age 11 years		Age 15 years	
	Male	Female	Male	Female	Male	Female
<b>Total (N)</b>	264	250	234	269	182	320
<b>BMI-for-Age (WHO) Z score <math>\geq +2</math> N (%)</b>	2 (0.8)	5 (2.0)	8 (3.4)	4 (1.5)	4 (2.3)	25 (8.0)
<b>BMI-for-Age (IOTF) Overweight/Obese N (%)</b>	9 (3.4)	23 (9.2)	12 (5.2)	26 (9.7)	11 (6.1)	72 (22.6)
<b>Body Fat Overfat/Obese N (%)</b>	44 (16.8)	50 (19.3)	13 (5.6)	23 (8.6)	8 (4.4)	74 (23.3)
<b>BMI-for-Age WHO Zscore <math>\leq -2</math> N (%)</b>	9 (3.4)	3 (1.2)	12 (5.2)	5 (1.9)	11 (6.2)	6 (1.9)
<b>BMI-for-Age (IOTF) Thinness N (%)</b>	42 (16.0)	38 (15.1)	30 (12.9)	33 (12.3)	29 (15.8)	26 (8.2)
<b>Body Fat Underfat N (%)</b>	23 (8.8)	44 (17.7)	114 (48.7)	53 (19.7)	109 (59.8)	29 (9.1)

Using BMI-for-age, prevalence of overweight/obesity was highest amongst females aged 15 years. Over-fatness was much more prevalent than overweight/obesity (using WHO reference). Body over-fatness appears to decrease with increasing age amongst males, whereas in females, highest levels were found in the oldest age group.

### Lifestyle

Sex	Age 7 years		Age 11 years		Age 15 years	
	Male	Female	Male	Female	Male	Female
<b>Total (n)</b>	264	250	234	269	182	320
<b>Water Collection N (%)</b>	231 (87.5)	225 (90)	199 (85)	235 (87.4)	124 (68.1)	254 (79.4)
<b>Walk to School N (%)</b>	196 (74.5)	181 (72.4)	226 (96.6)	247 (91.8)	161 (88.5)	256 (81)
<b>Electricity at Home N (%)</b>	209 (79.2)	203 (81.2)	164 (70.1)	194 (72.1)	140 (76.9)	243 (76.2)
<b>Watch TV N (%)</b>	204 (77.3)	204 (81.6)	178 (76.1)	193 (71.7)	137 (75.7)	245 (76.6)
<b>Sport Participation N (%)</b>	121 (45.8)	89 (35.6)	183 (78.2)	185 (68.8)	131 (72)	93 (29.1)

Most participants walk to school and to collect water. Despite the rural location 70-80% of children have electricity at home and similar numbers report watching TV regularly. Fewer than half of all children at aged 7 years and a third of females aged 15 years participate in sport.

**Discussion and Conclusion:** Prevalence of overweight/obesity was much higher in girls than boys, consistent with adult between-sex differences in obesity prevalence in the Demographic Surveillance Area. However BMI-for-age estimates of overweight and obesity (using WHO reference) appear to be conservative, since body composition data reveal a much higher prevalence of over-fatness, particularly in girls. Despite the emergence of overweight and obesity in this population, under-nutrition remains a problem, especially amongst older males.

### **Acknowledgements**

Yorkhill Children's Foundation, University of Glasgow, Wellcome Trust Core funding to Africa Centre for Health and Population Studies / University of KwaZulu-Natal, South Africa Department of Education

## **Poster 12**

### **Audit of special milk formulae prescriptions in primary care setting for feed intolerance in paediatric population.**

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### **Background**

Specialized milk formulae are commonly prescribed in infants and children for feed intolerance.

### **Objective**

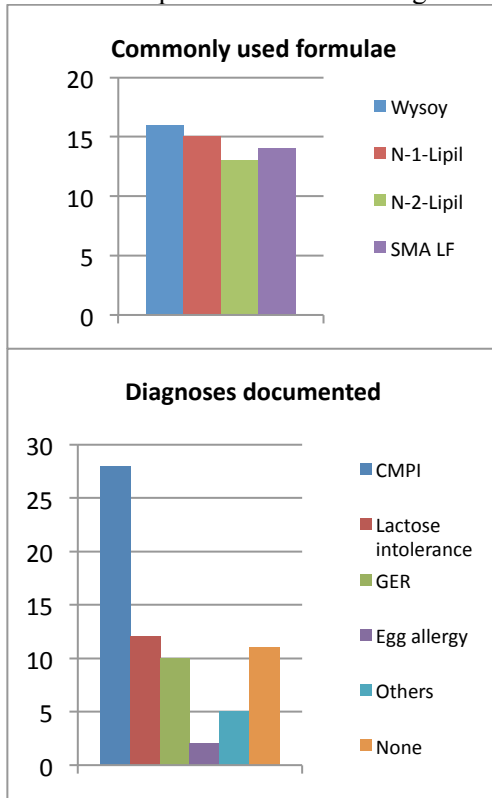
Our aim was to audit prescription of specialised milks for children in general practice population against the European Working Group guideline on management of cow's milk protein intolerance in infants.

### **Methods**

Prescription details were obtained from the community pharmacy information team. 4 GP practices were randomly selected. Patients were identified by the participating practices from prescription records. Clinical data was then collected from practice records.

## Results

Total no. Of patients – 58      Ages – 3 months to 5 years



- Additional results**
- 70% of children prescribed Wysoy were below 1 yr of age
  - 35% had at least 2 changes of formulae and 12% had more than 2 changes
  - Vomiting, eczema and diarrhoea were most common recorded symptoms
  - 35% went through various investigations including stool tests for cultures and reducing substances, RAST and rectal biopsy
  - 40% of these children were referred to a dietitian and a quarter were referred to a specialist
  - 17% were documented to have been offered a rechallenge.

**Abbreviations:**  
*N-1/2-Lipil – Nutramigen – 1/2 Lipil*  
*SMA LF – SMA Lactose Free*

*Others - (Milk allergy, dairy intolerance, secondary lactose intolerance, soya intolerance, milk free diet)*

**Discussion and Conclusion**  
Wysoy remains widely prescribed formula in infants. Many children were prescribed CMP free formula without the diagnosis of CMPI. Less than half were referred for a dietetic input. A structured re-challenge was either not offered or not documented in most children. Perceived feed intolerance in children proposes a clinical challenge in primary care but appropriate diagnosis and management in liaison with dietetic support should lead to an improved patient care and cost effectiveness.

**Acknowledgements**  
We are grateful to participating GP practices and their complete cooperation for this study.

## Development of children who were malnourished in early age and participated in a psychosocial stimulation program; a follow-up study

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**Background** Poor nutrition, high morbidity, poverty, and lack of home stimulation, all contribute to children's poor development.

**Objective** We previously conducted a cluster-randomized trial to assess the efficacy of a low-cost, feasible, and culturally appropriate program of child development attached to Community Nutrition Centers of Bangladesh Integrated Nutrition Program in 20 villages. The intervention significantly benefited mental development and behavior of malnourished children at the end of the trial. We aimed to assess whether benefits were sustained at school age.

**Methodology** Ten villages were assigned to a program of psychosocial stimulation for one year (IG) and 10 to control group (CG). Malnourished children (weight-for-age < -2SD) aged 6-24 months were selected from the intervened (n=104) and control (n=102) villages. Matching for age ( $\pm 6$  months), sex and village, 107 better-nourished children (BG) were also enrolled. We traced 90% of children at 9-11 years and assessed their full scale (FSIQ), verbal (VIQ) and performance (PIQ) intelligence quotient on Wechsler Intelligence Scale for Children-Revised edition and behaviour using the Strength and Difficulties Questionnaire given to the mothers.

**Results** Using t-test, IG children had slightly higher IQ scores and less behaviour problems than CG children but the differences were not significant. Multiple regression analyses controlling for age, sex and possible confounders showed no difference between the IG and CG. Using similar regression models, the BG had significantly higher FSIQ (B=4.6, 95%CI=2.5, 6.7, p<0.001), PIQ (B=4.0, 95%CI=1.9, 6.2, p=0.003) and VIQ (B=4.3, 95%CI=2.5, 6.2, p<0.001) than the combined malnourished groups.

**Discussion & Conclusion** The effects of intervention were no longer significant but may reappear after a lag period as has been shown elsewhere. Further follow-up of these children is warranted when school attainment should be examined. There is a need to develop models for promoting malnourished children's development that are effective, feasible and sustainable.

**Acknowledgements** World Bank, DFID, Improved Health for the Poor program at ICDDR,B

## Poster 14

### **The Use Of Brum1 Resequencing Microarray To Identify Mutations In Patients With Neonatal Cholestasis.**

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**Background:** Neonatal cholestasis is the presenting clinical feature of serious and potentially life limiting liver diseases such as progressive familial intrahepatic cholestasis (PFIC), arthrogyrosis-renal dysfunction-cholestasis (ARC) syndrome and Niemann Pick type C (NPC) disease. We have designed a resequencing microarray (BRUM1) capable of simultaneously sequencing multiple genes associated with neonatal cholestasis.

**Objective:** The objective of the study is to assess the utility of BRUM1 as a first-line molecular investigation for patients with neonatal cholestasis in whom an inherited cause is suspected.

**Methods:** DNA from 78 infants with suspected inherited conditions causing cholestasis in whom an inherited cause was suspected was amplified by PCR and hybridised to BRUM1 (validated against reference sequence with 98.9% agreement [CI 0.97 - >0.99]). Genes mutated in recessive forms of cholestasis were targeted, which included ATP8B1, ABCB11, ABCB4, VPS33B, VIPAR, NPC1 and NPC2 (patients were screened for other common causes such as alpha-1 antitrypsin deficiency by biochemical tests).

**Results:** 38 infants had pathogenic mutations which cause neonatal cholestasis. 22 of the mutations were novel.

Gene	Total number of different mutations	Novel mutations
PFIC1,2,3	18	11
VPS33B	5	4
VIPAR	2	2
NPC1,2	29	5

In this cohort of patients, 49% of infants with neonatal cholestasis had a genetic diagnosis identified by BRUM1. The time to diagnosis was 5-25 days.

Discussion: BRUM1 is a single molecular resequencing array which provides a specific and rapid diagnosis in infants with the phenotype of neonatal cholestasis. This reduces the delay from molecular genetic investigation at multiple diagnostic centres thus facilitating optimal clinical management and counselling.

**Conclusion:** In neonatal cholestasis a resequencing array can optimise clinical management and facilitate appropriate counselling of families.

Disclosure of Interest: None Declared

## Poster 15

### *Changes in Incidence ,pattern of disease and Management of Inflammatory Bowel Diseases (IBD) Over 10 years (1997 -2007) within SW region of England.*

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**Background** UK National prospective survey of childhood Inflammatory Bowel Disease (IBD) in 1997 documented incidence, symptoms, disease distribution, seasonality, ethnic differences and variations in diagnostic methodology (1). 33 of 739 children were from the South West (SW) region. Repeat UK national surveillance unit study was refused because numbers are too large so a regional study under taken in the SW where the single regional centre maintains a prospective database of all newly diagnosed paediatric IBD.

#### **Objectives:**

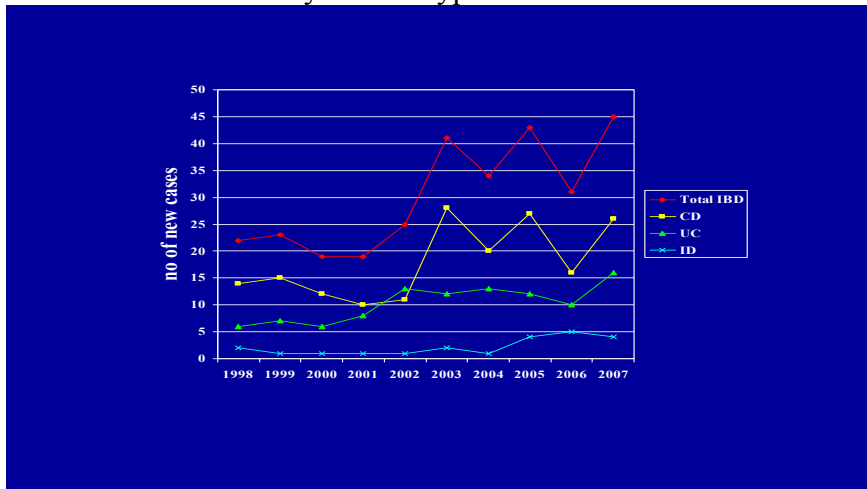
1. Document current incidence and note any change since 1997.

- Document whether children are being diagnosed in concordance with ESPGHAN Criterion ,and receiving optimal treatment (2).

**Methodology :**Data was collected from 13 paediatric centres within SW Region hospitals ,using international diagnosis codes (ICD10) to identify newly diagnosed cases of IBD (Crohns, Ulcerative Colitis and Indeterminate Colitis). Patient details were correlated with the database to obtain information on incidence and a clinical questionnaire was developed to obtain information on management.

**Results :** All 13 centres responded. There were a total of 47 newly diagnosed children with IBD during 2007 compared with 33 in 1997. 44/47 were diagnosed at the regional centre and were on prospective database. During 1997-2007 incidence of IBD/100,000 rose from 4 to 5.34 ( CD 2.4 to 3.0 ; UC 1.2 to 2.0 and IC 0.4 to 0.45 ). 27% of CD cases presented with classic triad .All had colonoscopy with ileal intubation in 83% .88% of CD and 57% of UC had upper gastrointestinal inflammation and 57% of CD had widespread colonic involvement.

**Table :** Cases of IBD by disease type :1997-2007



**Conclusions :** Incidence of IBD increased from 4/100,000 to 5.34/100,000 during 1997-2007. Most of the increase was in CD with a more recent increase in UC. Only 27% of CD presented with classic triad .Upper GI involvement is common .There was good concordance with ESPGHAN and BSPGHAN guidelines.

**Refs.** (1) Sawczenko A. Sandhu BK et. al.. Prospective survey of childhood inflammatory bowel disease in the British Isles. Lancet. 2001 357(9262):1093-4.  
 (2) Bhupinder K Sandhu, John M .E. Fell, R. Mark Beattie ,Sally G. Mitton, David C. Wilson, and Huw Jenkins on behalf of the IBD Working Group of BSPGHAN. Guidelines for management of Inflammatory Bowel Disease in Children in the UK. JPGN 2010;50 (S1):1-13.

### **Reduction in serum phosphate during refeeding with corn-soy blends, is prevented by addition of milk**

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Key words: Pig, malnutrition, maize, refeeding, corn-soy-blend

**Background:** Following a period of malnutrition corn-soy-blends (CSB+ or CSB++) are often used for refeeding purposes. CSB++ is enriched with milk powder and contains less anti-nutrients than CSB+.

**Objective:** Using an animal model of malnutrition, the objective was to study the effect of CSB+ and CSB++ as refeeding diets.

**Methodology:** Pigs (n=27) weaned at 4 weeks (wks) and nutritionally depleted for 7 wks using a pure maize flour diet, were allocated to either CSB+, CSB++ or maize flour for 3 wks. Body weight (BW), crown-rump-length (CRL) and blood sampling were done weekly and body composition (BC) was determined by DXA scan at 3 wks

**Results:** Relative to maize-fed pigs, CSB+ and CSB++ showed an equal increase in BW by 2.50 (95%CI:1.78;3.21) kg, CRL by 3.65 (1.74 ;5.56) cm and bone mineral density by 0.03 (0.01;0.05) g/cm<sup>2</sup>, whereas there were no differences in fat and lean body mass percentage. Compared with maize-fed controls, CSB+ resulted in a -0.44 (-0.76; -0.12) mmol/L drop in serum inorganic phosphate(s-P<sub>i</sub>) after 1 wk but returned to pre-refeeding levels after 2 wks. No drop was observed for pigs fed CSB++ and after 3 wks s-P<sub>i</sub> were 0.43mmol/L higher in CSB++ fed pigs relative to CSB+ (1.97 vs 1.53, p=0.04) and 0.72mmol/L higher compared to maize (1.97 vs 1.25,p=0.003).

**Discussion:** Whereas refeeding with CSB+ or ++ showed equal anthropometric effects, CSB++ prevented a transient decline in s-P<sub>i</sub> and resulted in higher levels after 3 wks, most likely due to the milk content . This may be particularly important for patients susceptible to hypophosphatemia during refeeding.

**Conclusion:** There is a need to assess the efficacy of current food aid products, and if needed to improve their quality.

**Predictor of convulsion in severe malnourished children.**

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**Background:** Childhood convulsion is one of the most important causes of attending medical centers, especially emergency departments and can be a cause of morbidity and disability in childhood. 4-10% of children suffer from at least one attack of convulsion in the first 16 years of life. Convulsion is also common in severely malnourished children although aetiology might be different. However data are delicate on the presenting features and associated factors of convulsion in children with severe malnutrition.

**Objectives:** The objective was to study the presenting feature and risk factor of convulsion among severely malnourished children compared to those without severe malnutrition.

**Methodology:** For this prospective study all under-five children presented with convulsion in ICU of Dhaka Hospital, ICDDR,B were included. In total 39 under-five children of either sex with convulsion were identified from September to December 2010. Comparison was made among children with (n=11) or without severe malnutrition (n=28).

**Results:** During the study period from 1682 admitted inpatient, 55 critically ill under-five children got admitted in the ICU of whom 39 (70%) had documented convulsion. Among them 11 (28%) and 28 (72%) presented with and without severe malnutrition (WHZ < -3SD) respectively. 9 (82%) of severely malnourished children were less than 12 months old with median age of 8 months. Severely malnourished children more often presented with lower serum calcium (p=0.05), longer duration of diarrhea prior to admission (p=0.04) compared to those without severe malnutrition. Moreover, these children were not immunized as per EPI schedule (64% vs 96%; p=0.02) and more often presented with severe pneumonia (82% vs 36%; p=0.03).

**Conclusion:** There thus, severely malnourished under-five children with severe pneumonia, partial immunization, longer duration of diarrhea, and lower serum calcium are prone to develop convulsion. Early recognition of these factors potentially help to prevent convulsion and their deadly consequences.

**Acknowledgements:** The financial support for the United States Agency for Development (USAID) and ICDDR,B fund is acknowledged.

## Coeliac Disease in Children presenting as Liver Disease

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Department of Paediatric Gastroenterology, Bristol Royal Hospital for Children, Upper Maudlin Street, Bristol BS2 8BJ, UK..

**Background:** Coeliac disease (CD) is a common condition. The incidence according to our prospective longitudinal study of 14000 children based on CD serology is 1% although by the age of 7 years 90% of them remain formally undiagnosed and possibly asymptomatic (ref.1). There is poor awareness that CD may present with symptoms and signs of liver disease.

**Objectives:** To document the clinical picture of children presenting to a regional paediatric gastroenterology unit with liver disease as the first manifestation of CD.

**Methodology:** Case notes of children presenting with liver disease to a regional paediatric gastroenterology unit who were subsequently diagnosed as having CD were analysed .

**Results:** Between 2004-20011 four children presented with significant liver dysfunction and were subsequently diagnosed with CD. One presented with ascites, transaminitis, hypoalbuminaemia and abnormal clotting which resolved on gluten free diet .Second presented with tiredness and had transaminitis, diagnosed as autoimmune hepatitis requiring prednisolone treatment. In the third, oesophageal varix was noted at the time of endoscopy and liver biopsy confirmed cirrhosis and portal hypertension. The fourth presented with liver failure leading to hepatic encephalopathy requiring her to be listed for an urgent liver transplant. She had no GI symptoms, negative coeliac serology but had a low IgA. CD was only diagnosed after she underwent upper GI endoscopy with biopsy as a part of routine liver transplant work up. She improved on gluten free diet without liver transplant.

**Discussions:** CD associated liver disease can produce transient transaminitis in up to 40% of cases. Rarely it may present with autoimmune hepatitis; acute liver failure and cirrhosis with portal hypertension. Gluten free diet normalises liver enzymes in most children but some may need additional treatments

**Conclusion:** CD should be considered early in differential diagnosis of children presenting with liver disease.

Reference. Ravikumara M, Nuttigattu YKT, Sandhu BK, Ninety percent of celiac disease is being missed. J. Ped. Gastroenterol Nutr. 2007; 45:497-99.

### ***Clostridium difficile* Mediated Effects on Intestinal Epithelia**

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#### **Abstract**

*Clostridium difficile* infection (CDI) is a major cause of hospital infection, morbidity and mortality however asymptomatic carriage has also been reported. *C. difficile* virulence is associated with production of toxins (A, B and binary). The role of toxins has been well studied but how the gastrointestinal mucosa responds to bacteria itself is unknown. In the present study we compared and contrasted the effect of *C. difficile* [R20291, 630 (A<sup>+</sup>B<sup>+</sup>) and M68, CF5 (A<sup>-</sup>B<sup>+</sup>)] strains on human intestinal epithelial cells (IECs) physiology with the aim to delineate bacterial-mediated effects on IEC. Inter strain variation in bacterial adherence to IEC was noted however adherence did not correlate with the magnitude of downstream cellular responses, as measured by transepithelial electrical resistance (TEER), antimicrobial immunity or the rate of apoptosis. R20291 was most potent, M68 (A<sup>-</sup>B<sup>+</sup>) strain was found to be as cytotoxic as (A<sup>+</sup>B<sup>+</sup>) strains. In contrast, CF5 (A<sup>-</sup>B<sup>+</sup>) strain had the least effect on barrier integrity, cell death and proinflammatory cytokine production. Similar findings were also observed in an ex-vivo model of infection in human colonic explants. The differences in host responses noted during infection may be indicative of their pathogenic potential.

### **Vitamin D supplementation: Midwives, Health Visitors and GP's have their say!**

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**Background** Cases of vitamin D deficient rickets in the UK are rising. Despite recent Department of Health and the National Institute of Clinical Excellence guidelines on vitamin D supplementation, and the Government initiative 'Healthy Start', supplementation rates remain poor.

**Objective** The aim of our study is to assess the awareness of vitamin D supplementation amongst different key groups of health care professionals.

**Methodology** Questionnaires were distributed to health visitors, general practitioners and midwives within a South London borough from June to July 2010.

**Results** A total of 77/116 health care professionals responded. Routine supplementation advice was given by 8/34 (24%) midwives and 2/21 (10%) GPs for all pregnant women, and by 10/22 (45%) health visitors and 3/21 (14%) GPs for all breastfeeding women and breast-fed babies. At least one high risk group for vitamin D deficiency was identified by 8/12 (67%) health visitors and 17/26 (65%) midwives, compared to 2/19 (11%) GPs. Formula-fed children needing supplementation were recognized by 13% of GPs and 68% of health visitors. No GPs, 65% of midwives and 95% of health visitors were aware of 'Healthy Start'. All groups requested further clarity on vitamin D supplementation (95% of GPs, 74% of midwives and 50% of health visitors).

**Discussion and conclusion** Our study highlights uncertainty amongst all three groups regarding vitamin D supplementation. Co-morbidities from vitamin D deficiency make this preventable condition unacceptable. We have devised a simplified version of the national guidelines and propose the addition of vitamin D advice to antenatal booking forms and potentially the national red book.

#### **Acknowledgements**

Bexley NHS Care Trust  
Queen Mary's Hospital, Sidcup

## **Poster 21**

### **A pig model of kwashiorkor shows rapid anthropometric, hematological and biochemical changes**

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**Background:** Little is known of the temporal changes during malnutrition. In infants progression to severe acute malnutrition ultimately leading to Kwashiorkor, is not well understood. This may partly be due to lack of prospective studies

**Objective:** Using repeated measurements in a prospective study our objective was to understand how nutritional depletion changes anthropometric, hematological and biochemical markers in a pig model.

**Methodology:** Four-week old pigs (mean bodyweight 6.9 kg) were weaned from their mothers and given ad libitum access to maize flour (maize, n=12) or a nutritionally optimized diet (control, n=12) for 7 weeks. Weekly measurements of body growth and hematology and plasma levels of albumin, alanine aminotransferase (ALAT), bilirubin and electrolytes were collected. Pigs were finally euthanized and organ dimensions were recorded.

**Results:** During seven weeks there was growth arrest in maize-fed pigs whereas control pigs displayed fast growth with final body weights of 8.3 kg (maize) vs. 32.4 kg (control) ( $P<0.001$ ). After 4 weeks hemoglobin, cell volume and hematocrit values were significantly reduced in maize-fed pigs (all  $P<0.05$ ) with increasing clinical signs of anemia throughout the study period. After 1 week albumin concentration was significantly decreased ( $P<0.04$ ) and continued to decrease in maize-fed pigs. Bilirubin concentration was increased in maize-fed pigs after 1 week ( $P<0.01$ , 0.9  $\mu\text{mol/L}$  vs. 0.2  $\mu\text{mol/L}$ ) and ALAT was increased in maize-fed pigs after 3 weeks ( $P<0.001$ , 118 U/L vs. 87 U/L). Finally, calcium, potassium, sodium and phosphorus were all significantly reduced in maize-fed pigs from week 4 onwards (all  $P<0.05$ ).

**Conclusion:** A uniform maize diet induces rapid changes in growth and blood profile values. Whereas the symptoms of malnutrition resembled that of marasmic children, generalized edema as seen in Kwashiorkor may require an additional precipitating event.

Poster 22

### **Mother's Knowledge and practices on Infant and Young child Feeding practices in Bangladesh**

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3. University of Western Sydney, Sydney, Australia

**Background:** Infant and young child feeding practice has been recognized as one of the greatest challenge to the reduction of child mortality. Breastfeeding performance has been a major concern in the present world.

**Objectives:** The study aimed at describing the breastfeeding practices and to examine the socio demographic and maternal knowledge and practice related factors associated with selected breastfeeding indicators.

**Methodology:** The study was a multi-stage-cluster sample survey of 35,098 households from 113 upazilas in 6 different divisions in Bangladesh. A total no of sample was 8819 children aged 0-23 months. Information on socio-demographic characteristics, infant and young child feeding (IYCF), maternal knowledge on breastfeeding were collected.

**Results:** The proportion of children, who were ever breastfed (99.5%) or currently breastfeeding (96.1%) was very high, but exclusive breastfeeding and timely suckling rate was only 13.6% and 30.2% respectively. The rate of exclusive breastfeeding and early initiation to breastfeeding was higher among the mothers who had appropriate knowledge and practice on breastfeeding and colostrum feeding compared to the mother's who had wrong knowledge and practice(exclusive breastfeeding: 33.4% Vs.11.8%,  $p<0.05$  ; Early initiation of Breastfeeding: 31.0% Vs. 18.5%, $p<0.01$ ) . Multivariate analysis revealed that infants in the wealthiest household were significantly more likely to exclusive breastfeed compared to the poor or poorest households (OR=0.49, 95%CI: 0.28-0.85,  $p=0.012$ ).

**Discussion and Conclusion:** In Bangladesh, breastfeeding performance is satisfactory, except exclusive breastfeeding. Socioeconomically privileged group demonstrated better breastfeeding performances compared to the disadvantaged group. Correct knowledge and practice on breastfeeding has positive effect on breastfeeding performances. Moreover, breastfeeding promotion programmes are needed nationwide to increase awareness of breastfeeding in Bangladesh.

**Acknowledgement:** I would like to acknowledge University of Sydney, International Centre for Diarrhoeal Disease Research Bangladesh (ICDDR,B) and National Nutrition Programme (NNP), Government of Bangladesh with gratitude for their support to conduct this study.

**To determine the exclusive breastfeeding rate and related factors in urban slums of Dhaka city.**

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**Background:** Breast feeding is the gold standard of infant and is unequal for survival, growth and development of children. Exclusive breastfeeding for six months, including giving colostrums is crucial for child survival, growth and development. Colostrums stimulate the newborn's immune system and rate is 99% of the mothers feed colostrums within three days of delivery. Breastfeeding for a child is all about which ensure nutrition security.

**Objectives:** To assess the rate and identify the factors which influence exclusive breastfeeding in selected urban slums of Dhaka city in Bangladesh.

**Methods:** This cross sectional descriptive study was conducted in selected six slums of Dhaka City. Information was collected from 183 lactating mothers having infants aged 0-6 months using a pre-tested questionnaire. Data on age of the mothers, educational status of the parents, monthly household income, breastfeeding initiation time, pre-lacteal feeding status and breastfeeding status of the infants were collected.

**Results:** Early initiation of breastfeeding (EIB) rate was 32.2%. Colostrum giving rate was 42.6% infants. The rate of pre-lacteal feed was as high as 57.4 %. About 50% mothers gave inappropriate early feeds to the infants. Exclusive breastfeeding (EBF) rate was 54%. The children who did not have any disease in last 15 days were better associated with EBF (68.4%). Breastfeeding counseling was received by 57.4% mothers. Mothers received advice from doctors, nurses and health care centers were 47% whereas 53 % received it from family members, relatives or media. The EBF rate was higher (55.4%) in group having income less than Taka 6000/-(US\$88) per month compared to higher income group (46.2%).

**Discussion and conclusion:** Breastfeeding practice of urban slum mothers shows an alarming picture, which needs immediate action for improvement. EBF rate was encouraging for the slum compared to earlier studies and reinforced that EBF protected children from illness

**Acknowledgement:** The authors gratefully acknowledge the Nutrition Foundation of Bangladesh, Dhaka and Food and Nutrition Department of Home Economics College, Azimpur, Dhaka and ICDDR, B.

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## Poster 24

### **Specially formulated foods for treating children with MAM: preliminary results of a Cochrane review**

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**Background:** Moderate acute malnutrition (MAM), affects around 10% of children U5 in low- and middle-income countries and has a major impact on child mortality. Food interventions aim to reverse inadequate food intake, which is one of the immediate causes of malnutrition.

**Objective:** To systematically review the evidence of efficacy and safety of different types of foods to rehabilitate children with MAM.

**Methodology:** We will searched CENTRAL, MEDLINE, EMBASE, LILACS, CINAHL, BIBLIOMAP, POPLINE, ZETOC, and Field Exchange, for published studies. For ongoing studies we will search the WHO Platform (ICTRP), MetaRegister of Controlled Trials (mRCT), Current Controlled Trials (CCT), SCN-MAM e-platform. We will also contact a list researchers working in international NGOs and GOs, technical bodies and academic institutions.

Randomised controlled trials (RCTs), non-randomised controlled clinical trials (CCTs), controlled before-and-after studies (CBAs) and interrupted time series (ITS) studies will be included. Any type of food will be considered: 1) Improved adequacy of local diet; 2) Lipid based supplements; 3) Blended food supplements; 4) Complementary foods supplements. Two authors will assess study eligibility and methodological quality and extract and analysed data. Primary outcomes will be: 1) Progression to severe acute malnutrition; 2) Weight gain; 3) Weight/Height; 4) MUAC (studies in individuals); 1) Recovery rate; 2) Death rate; 3) Defaulting rate (studies in populations). We will summarize dichotomous outcomes using risk ratios (RR) and continuous outcomes using mean differences (MD) with 95% confidence intervals (CI). Where appropriate, we will combined data in meta-analyses (fixed or random-effects model) and assess

heterogeneity. Heterogeneity will be explored by subgroup analysis, and if appropriate, by meta-regression.

**Results:** The preliminary results of the systematic review will be presented at the meeting.

**Discussion and Conclusion:** Implication for practice and, if possible, a statement of the policy implications will be presented at the meeting. Implication for research will also be discussed.

**Acknowledgements:** the systematic review is funded by WHO- HQ Geneva.

## Poster 25

### Long term follow up of children receiving Tacrolimus (Tac) or Cyclosporin A-Microemulsion (CyA) post liver transplantation

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**PURPOSE:** To compare 10 year safety and efficacy of Tac and CyA in children post liver transplantation (OLT)

**METHOD:** 181 children enrolled in a 10 centre, European study. 91 received dual therapy (Tac+steroids, initial dose 0.3mg/kg/day, trough 10-20 ng/mL), 90 received triple therapy (CyA, Azathioprine+steroids, initial dose 10mg/kg/day, trough 100-350 ng/mL). 13 died in the first year and 168 children are under follow up. All results expressed as median (range) on an intent to treat basis.

**RESULTS:** 68/168 children at 3/10 centres (34 Tac) reviewed to date. 16/68 excluded from analysis: 10 lost to follow up (3.8yrs) (4 Tac); 6 died (1.4yrs) (3 Tac). 52 (26 Tac) reviewed at median follow up 10.9 yr post OLT. Histologically proven rejection: 8 (30%) patients (14 episodes) of acute rejection (AR); 2 (8%) chronic rejection (CR) recorded at 2-5 years post OLT all on CyA: Late rejection: AR in 3 patients: 2 (6%) Tac; 1 (6%) CyA; CR developed in 3; 2 (6%) Tac; 1 (6%) CyA (median 8.1 yrs) 3 PTLD cases reported in first 2 yrs post OLT with none since; no insulin dependent diabetes reported. Median renal function (cGFR ml/min/1.73m<sup>2</sup>): 115 (Tac) and 125 (CyA) 10 yrs post OLT (p=ns): 22 had baseline immunosuppression changed due to adverse events: CyA (n=16): AR (10): Renal Dysfunction (4); others (2); Tac (n=6): AR (3); PTLD (1); others (2).

There was no significant difference in patient or graft survival at any time post OLT between groups.

**CONCLUSION:** Of 68 children reviewed in this long term follow up study, 6 died and 10 are lost to follow up. 20/26 (77%) in Tac group and 10/26 (38%) in CyA group remain on original i/s. There is no difference in the incidence of late rejection or in renal function, however there were more episodes of early rejection and adverse effects in those on CyA and hence fewer children remained on this drug. There was no overall difference in survival in those receiving either Tac or CyA up to 10 yrs post OLT

**Poster 26**

### **SINGLE CENTRE EXPERIENCE ON LIVING DONOR LIVER TRANSPLANTATION IN CHILDREN IN INDIA**

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**AIM:** To assess the outcome of pediatric patients with living donor liver transplantation (LDLT) .

**Methods:** Retrospective analysis of prospectively collected data of 58 pediatric patients who underwent LDLT in last 6 and half years.

**Results:** Out of the 58 cases, 36 were males (62%) with mean age of 6.08 years (5 mths-16 yrs) and mean weight of 21Kg(5.8-60). Indications were cholestasis in 27( biliary atresia 21) and metabolic in 15 ( Wilson's disease10, tyrosinemia1,primary hyperoxaluria 2 ,maple syrup urine disease 1 and factor VII deficiency 1 ). 18 patients presented with acute liver failure out of which 8 were Wilsons disease. Other indications were giant cavernous hemangioma 1 , autoimmune hepatitis 2 and cryptogenic cirrhosis in 3 . Parents were the donors in 39 , close relatives in 17. There was 1 swap donor and 1 domino graft. The grafts included left lateral 25(43%) of which 8 were reduced ,left lobe 27(46.5%) , right lobe 5(8.6%) and whole liver in 1 case(domino). Hypertension(34%),acute rejection (35.7%), hyperglycemia(32%), sepsis(34%), pleural effusion/collapse(26.7%),CMV hepatitis(42.8%), biliary leak(3) and chylous ascites (3)were the immediate post-transplant complications. Portal vein thrombosis was seen in 5 (3 early – successfully managed at re-laparotomy and 2 late - managed conservatively) and Hepatic artery thrombosis (HAT) in 1 case (died). 4 patients had chronic rejection. Enzymes normalization and steroid withdrawal(30.35%) occurred over a mean period of

16.25 days and 14 months (6-36) respectively . There were two early deaths – an operative mortality of 3.5%, and 4 late deaths. Overall, 52 of the 58 patients (89.2%) are alive and well at mean follow up of 27.4 months (4-75 ). 18(32%) patients were < 10 Kg , out of which 4(22%) died. Mean hospital stay was 29 days (15 - 63).

**Conclusion:** Pediatric LDLT is well established in India with results comparable to best centres internationally. Overall survival was inferior in <10 Kg babies. Immediate complications, although frequent, are manageable. Long term complications are uncommon.

## Poster 27

### “Willingness to pay for nutrient supplements to prevent early childhood under-nutrition: preliminary results from a RCT”

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**Background:** Nutritionists and policy makers are aware of potential private returns to investments in early childhood nutrition; however, household resource allocation decisions within resource-poor households may not always coincide with their expectations or advice. For this reason, assessments of willingness-to-pay (WTP) estimates are needed that consider cash and other constraints faced by these households vis-à-vis the expected benefits of improved early childhood nutrition.

**Objective** This paper reports the preliminary results of an evaluation of households’ stated WTP for Lipid-Based Nutrient Supplements (LNS) and for a traditional nutrient supplement in the context of a randomized controlled trial in south-central Malawi. Primary data on participant, caregiver, household and village characteristics are use to

explore differences in WTP across households. The implications of these preliminary results for policy are discussed.

**Methodology** The iLiNS Project is administering a randomized controlled trial in rural Malawi aimed, specifically, at the prevention of early childhood under-nutrition. Contingent valuation methods are used to elicit hypothetical WTP for LNS and a readily-available traditional alternative to LNS from a randomly selected subsample of households (sample size > 300) in the iLiNS trial population. Using multiple regression analysis, WTP for LNS will be modelled as a function of participant characteristics (e.g., gender), caregiver characteristics (e.g., age), and household characteristics (e.g., income).

**Results** Results currently in hand for a small sub-sample suggest that the households' decision makers state that they are willing to pay approximately USD 0.80 for a week's supply of LNS. The paper will present and discuss the distribution of mean WTP for the entire sample, for both a week's supply of LNS and a week's supply of a traditional substitute consumed in early childhood. Household-level and other factors associated with stated WTP for LNS will also be presented and discussed.

**Discussion & Conclusion** The ultimate effectiveness of interventions for preventing early childhood under-nutrition, on a large scale, may hinge on their acceptance and regular consumption by target populations, under real-world conditions. This study will add important information regarding the stated WTP for LNS products and the socio-economic factors that influence this, all of which may be useful in designing policies.

**Acknowledgements** This study is funded in part by the Bill and Melinda Gates Foundation.

**Poster 28**

### **Multi-dimensional associations of under nutrition-and scope for optimum child feeding practice**

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**Background:** Despite impressive progress, the prevalence of child under nutrition in Bangladesh remains high. Infant feeding practice in rural communities is inappropriate and complementary foods are poor in energy and micronutrient content.

**Objective:** To assess baseline nutritional status and current feeding practice of young children for a proposed intervention aimed at improving nutritional status by promoting optimum child feeding practices.

**Methodology:** A cross sectional survey was conducted in two North Eastern sub-districts- Karimganj (intervention) and Katiadi (control). 5,200 children aged under-two and 1,180 mothers were enrolled for anthropometry and assessing child feeding practices. Hemoglobin estimation was done in 500 children. Wooden length board and digital weighing scale was used for anthropometry. Hemoglobin was assessed by Hemocue.

**Results:** There was no significant difference in prevalence of child stunting - 43.2 % (intervention) vs. 42.5% (control). No significant difference was observed in prevalence of anemia (82.7% vs. 82.5%). Mothers of the intervention area had higher mean BMI (19.66 vs. 19.26;  $p=0.012$ ; 95% CI for mean difference: 0.08, 0.7). Household monthly income and expenses on food was more in the control area (USD 107 vs. 96;  $p=0.000$ ; 95% CI for difference: -16, -6) and (USD 71 vs. 65;  $p=0.000$ , 95% CI for difference: -7.3, -3.3) respectively. Infant feeding practice was better in the intervention area on most of the indicators, e.g. timely breastfeeding (55% vs. 34%), exclusive breastfeeding (45% vs. 36%), minimum acceptable diet (17% vs. 9%), and, less use of bottle feeding (10% vs. 16%).

**Discussion:** Control area has advantage, as higher income and expenses on food, while more mothers of the intervention area comply with good child feeding practice, culminating in similar prevalence of under nutrition.

**Conclusion:** The study shows that the nutritional status of children is the outcome of structural and behavioral factors. Promotion of optimum feeding practice may be a potential intervention.

**Acknowledgement:** CARE International

## **Subtypes and intestinal-related and extraintestinal symptoms of irritable bowel syndrome in children**

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**Background:** Irritable bowel syndrome (IBS) is a common paediatrics functional bowel disorder affecting 6-13% of children and adolescents. Its subtypes has not been characterised in children.

**Objectives:** The main objectives of this study were to assess IBS subtypes in 10-16 years old children, their symptomatology and gender difference.

**Methodology:** Hundred and seven children with IBS and 1610 healthy controls aged 10-16 years were recruited, from in 8 randomly selected schools, in 4 randomly selected provinces (out of 9 provinces) in Sri Lanka. Data was collected using a previously validated, self administered questionnaire based on Rome III criteria. It was distributed in examination setting to ensure privacy and confidentiality and was filled under the guidance of research assistants. IBS was defined using Rome III criteria.

**Results:** Constipation predominant IBS (IBS-C), diarrhoea predominant IBS (IBS-D) and mixed IBS (IBS-M) were present in 27-28%. Untypable IBS (IBS-U) was seen in 17.8%. IBS was more common in girls (59.8% vs. 40.2% in boys,  $p=0.001$ ). Straining, urgency and feeling of incomplete evacuation were seen in 74-78% with IBS. Intestinal-related symptoms such as bloating, flatulence, nausea, vomiting and burping, and extraintestinal symptoms such as headache, sleeping difficulty, limb pain and photophobia were significantly higher in affected children ( $p<0.05$ ). Burping was more commonly seen in boys with IBS ( $p<0.05$ ).

**Discussion and Conclusions:** This study shows the distribution of IBS subtypes in 10-16years olds, their symptom characteristics, and bowel habits. IBS-C, IBS-D and IBS-M have almost equal distribution while IBS-U has a relatively lower prevalence. Girls are more commonly affected than boys. Intestinal-related and extra-intestinal symptoms are seen in a significantly higher in children with IBS, indicating the higher occurrence of somatisation among them.

**Acknowledgements:** We acknowledge University of Kelaniya, Sri Lanka for funding this research.

**Micronutrient status and enteropathogens between breastfeeding and other feeding patterns in Bangladeshi children with acute diarrhea**

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**Background:** Recovery from diarrhoea is mainly related to nutritional status, diarrhoeal pathogens, feeding practices or micronutrient status of an individual. There is inadequate information on the relationship of dietary pattern, nutritional status, serum micronutrient levels and diarrhoeal pathogens in young children hospitalized with acute diarrhoea.

**Objective:** To assess the relationships of dietary pattern with nutritional status, micronutrient status and bacterial pathogens in young children with acute diarrhoea.

**Methodology:** A total of 209 children aged between 4 and 24 months with less than 3 days of diarrhoea were randomly selected from Dhaka Hospital of the ICDDR,B on their admission day. Caretakers were interviewed for the subject's feeding practice. Nutritional status was assessed with standard anthropometric measurement. Diarrhoeal pathogens were isolated by microbiological assay and serum zinc and vitamin A were assayed using biochemical analysis.

**Results:** Twelve percent of the children were exclusively breast-fed. Sixteen percent of the illiterate mothers exclusively breast fed their infants compared to 7% of mothers above primary education ( $p=0.01$ ) and 15% of the poor mothers exclusively breast fed their infants compared to 7% of the middle class mothers ( $p=0.01$ ). Stool pathogens were isolated from two thirds (67%) of the subjects. Exclusively breastfed infants had higher serum zinc, retinol binding protein (RBP) and fewer bacterial pathogens than non-breastfed subjects (12 Vs 25%); on the other hand, rotavirus was more frequently isolated from the breastfed subjects. Fifty three per cent of the study children were moderately malnourished ( $\leq 75\%$  of wt/age of NCHS median).

**Discussion and conclusion:** Age of the children, mother's education and socioeconomic status had negative relationship with breast-feeding and nutritional status. Exclusive breast-feeding was associated with less bacterial pathogens and higher serum zinc and RBP among young infants presented with diarrhoea.

**Acknowledgement:** This study was conducted with the support of The Wellcome Trust, UK. ICDDR,B acknowledges with gratitude the commitment of The Wellcome Trust to the Centre's research efforts.

**Relative Risk of Non-accidental Deaths among Children by Their Nutritional Status in Rural Areas of Bangladesh**

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**Background:** The mortality risk of children by nutritional status in Bangladesh was studied 25 years ago and earlier, which showed lack of recent information on the risk by levels of malnutrition. The present study evaluated the relative risk of mortality of under-2 children by their degree of malnutrition and updated information.

**Objective:** Determine the relative risk of non-accidental deaths in 2007 among under-2 children surveyed in 2004 by their nutritional status.

**Methodology:** The Baseline Survey of the National Nutrition Project (NNP), conducted in 2004, covered 44 NNP intervention, 53 BINP (Bangladesh Integrated Nutrition Programme), and 16 NNP comparison upazilas, with households having under-2 children from 6 divisions in Bangladesh. The study was conducted in 105 upazilas of the NNP Baseline Survey. The survey compared risk of deaths of children surveyed in 2004 by their nutritional status. Verbal autopsy was used for identifying the possible underlying cause of childhood death. A combination of structured and open-ended questionnaire was used for collecting information on the causes of death.

**Results:** Of 9,217 index children in 2004, 49 died due to non-accidental causes. Severely-underweight children had 4 times higher mortality risk than normally-nourished children. There were 3.41 and 1.68 times higher risk of mortality of severely- and moderately-wasted children compared to well-nourished children. Severely-stunted children had 2.83 times higher and moderately-stunted children had 1.26 times higher mortality risk compared to non-wasted children. The main causes of death were septicaemia, shock, pneumonia, diarrhoea, gastroenteritis, and tetanus. According to weight-for-age z-score, 35% of deaths occurred in 12% of severely-malnourished children.

**Discussion and conclusion:** Higher mortality rates proved to be strongly associated with the nutritional status of under 2 children. There was a impressive decline in mortality rate among under 2 children. Programmmes to reduce child mortality should target severely underweight children than wasted children for saving more lives.

**Determinants of inappropriate complementary feeding practices in infant and young children in Bangladesh: Secondary data analysis of Demographic Health Survey 2007**

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**Background:**

Suboptimal and inappropriate complementary feeding practices are one of the major causes of child undernutrition in the first two years of life in South Asian countries including Bangladesh.

**Objectives:**

The aim of this study was to use the newly developed WHO infant feeding indicators to identify the potential risk factors associated with inappropriate complementary feeding practices.

**Methodology:**

We used data for 1,728 children aged 6-23 months obtained from nationally representative data from the 2007 Bangladesh Demographic and Health Survey (BDHS) to assess the association between complementary feeding and other characteristics using multivariate models.

**Results:**

Only 71% of infants were consuming soft, semi solid and solid food by 6-8 months of age. In the multivariate analysis, mothers who had no education had a higher risk for not introducing timely complementary feeds (AOR = 2.31, 95% CI: 1.07 to 4.96, p=0.033), not meeting the minimum dietary diversity (AOR = 1.69; 95% CI, 1.14 to 2.54, p=0.01), minimum acceptable diet (AOR=1.70, 95% CI: 1.09 to 2.67, p=0.02) and minimum meal frequency (AOR=1.73, 95% CI: 1.20 to 2.49, p=0.003) than the mothers who had secondary or higher education. Infants born in Sylhet, Chittagong and Barisal division had higher risks for not meeting minimum dietary diversity, meal frequency, and acceptable diet (p<0.001).

**Discussion and conclusion:**

The poorest two quintiles had poor levels of minimum meal frequency but dietary quality improved with age. Poor complementary feeding practices were associated with lower parental education, father's occupation, geographical region and age of the child. Parental education is an important protective factor, which might be linked to dietary knowledge, dietary diversity, quality of food, and feeding frequency. In Bangladesh addressing the 4<sup>th</sup> MDG target will require substantial improvement in complementary feeding practices and development of the health system to deliver the required IYCF programs.

### Poster 33

#### **Ethnic diversity of Childhood Inflammatory Bowel Disease in Europe**

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 Bristol Royal Children's Hospital, Bristol, UK

**Background:** Epidemiological studies of childhood IBD may provide valuable information on risk factors and pathogenesis. There are documented differences in incidence, prevalence and disease characteristics within countries and in various ethnic groups.

**Objective:** Within a prospective multicentre European Study, to compare the variations in pattern of presentation of IBD in children from various ethnic groups.

**Methodology:** The EUROKIDS registry is a prospective, web-based registry of newly diagnosed Paediatric IBD patients set up by the IBD working Group of ESPGHAN. 34 centers in 18 countries provide cross-sectional data on every newly diagnosed IBD(0-18yrs) in accordance with the Porto criteria within 3 months of the diagnosis. All patient data was accessed from its inception May 2004 to Feb 2011(81 months). The registry is maintained according to the instructions of the ethics committees.

**Results:** The table below depicts the number of cases of IBD and the distribution in the major ethnic groups.

Ethnicity	IBD(Percentage)	CD(Percentage)	UC(Percentage)	IC(Percentage)
White- European	2576(88.5)	1593(62)	773(30)	210(8)
Afro-Caribbean	33(1.1)	20(60.6)	11(33)	2(6)
Asian	94(3.2)	56(59.6)	31(32.9)	7(7.5)
Arab	89(3)	58(65)	25(28)	6(6.7)
Mixed	42(1.4)	30(71)	8(19)	4(9.5)
Other	75(2.6)	45	29	1
Total	2909	1802(62)	877(30)	230(8)

**Discussion and Conclusions:** The majority of cases belong to the White-European group and reflects population compositions. In the pattern of IBD, percentages of CD, UC and IC were 62, 30 and 8 which are similar to 61, 26 and 13 respectively, found in our large national prospective study in the UK(1).

In this large cohort, there is no significant difference in the pattern of IBD within major ethnic groups. However, in the mixed group, CD appears to be relatively preponderant. Variations in disease characteristics require further analysis.

**Acknowledgements:** To all the members of the EUROKIDS registry for meticulously providing the data.

**Reference:** 1. Author(s): Sawczenko A, Sandhu BK, Logan RFA, Jenkins H, Taylor CJ, Mian S, Lynn R, Title: Prospective survey of childhood inflammatory bowel disease in the British Isles, Journal: Lancet, Volume: 357, Year: 2001, PageNo: 1093-4

**Poster 34**

### **‘Vanishing Bowel’ – a case of closed Gastroschisis**

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**Dr Sanka**, Specialist Registrar in Paediatrics, Addenbrookes Hospital.

**Background:** Gut absorption and subsequent atresia with proximal bowel dilatation (‘Vanishing gastroschisis’) is an extremely rare in- utero complication of gastroschisis with only few cases being reported in the literature. This condition is associated with significant morbidity and mortality due to short gut syndrome and intestinal failure associated liver disease<sup>1,3</sup>.

#### **Case history: (four figures to include)**

A male infant was born prematurely at 32 weeks gestation with significant abdominal distension. In the para umbilical region was a fibrosed tissue remnant measuring 2 cm connected by an avascular stalk. The anomaly scan at 20 weeks gestation had revealed gastroschisis with subsequent scans showing bowel dilatation and polyhydramnios. Laparotomy on day 1 of life revealed a dilated, blind ending bowel loop of 20 cms (15 cms duodenum, 5 cm jejunum) with rest of the jejunum and ileum absorbed and a micro-colon present. A jejunostomy was fashioned and a central line inserted for parenteral nutrition (PN). He thrived but remained fully dependant on PN. He developed progressive intestinal failure associated liver disease and at the age of 18 months and received a combined small bowel and liver transplant. He is now 27 months old, receives

full enteral nutrition and has normal liver function. He receives maintenance immunosuppressive treatment and anti-viral therapy for EBV viraemia.

**Discussion:** Babies born with closed gastroschisis often lack large portions of their mid- and hind-gut. There is usually a blind-ending dilated loop of proximal small bowel and a micro-colon with or without a fibrous band connecting them.

Gut absorption occurs due to strangulation and subsequent necrosis of the eviscerated bowel likely secondary to the spontaneous closure of the abdominal wall defect<sup>1</sup>. It may also be due to a lack of normal mesenteric attachment, which would allow the bowel to twist and undergo strangulation secondary to volvulus of the mid-gut blood supply<sup>2</sup>. This condition is associated with significant morbidity and mortality due to intestinal failure induced cholestatic liver disease<sup>1,3</sup>.

Such infants should be managed in intestinal rehabilitation units with multidisciplinary teams experienced in the management of short gut. Bowel lengthening procedures (Bianchi or serial transverse enteroplasty techniques –STEP) may lead to improved absorption of enteral nutrition; however children who develop severe liver disease will require referral for bowel and liver transplantation.

Fig.1 Necrotic intestinal remnant to right of normal umbilical cord

Fig 2: Significantly dilated loop of small bowel

Fig.3 Dilated redundant loop of duodenum. Micro-colon

Fig 4: Patient with abdominal expanders, preparation for intestinal transplant.

## Poster 35

### **‘Constipation is not always functional’ – A case of caudal regression syndrome.**

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**Background:** We report an unusual case of a toddler who presented to our Gastroenterology clinic with chronic Constipation not getting better on high dose laxative treatment. He has an underlying congenital spinal malformation known as the caudal regression syndrome.

#### **Case history: (3 images to include)**

An 18 month old Caucasian girl was referred to our tertiary Gastroenterology clinic for an assessment of difficult to manage ‘functional’ constipation. She was born at term with no peri-natal complications and passed meconium within the first 24 hours of life. Pregnancy and ante natal scans were unremarkable. She suffered with constipation since

very early weeks of life and did not respond to conventional laxative treatment. She also had frequent episodes of proven urinary tract infections.

Physical examination revealed small, flattened buttocks with loss of gluteal cleft and a patulous anus (figure). Her gross motor development was delayed. Spinal cord abnormality was suspected and a lumbo sacral spinal MRI was arranged. This showed partial agenesis of the sacrum with a truncated conus medullaris at the level of T12/L1 consistent with CRS (figures)

CRS is a congenital condition characterised by premature termination of the caudal spine which is associated with urologic, orthopaedic, gastrointestinal and neurological manifestations<sup>1,3</sup>. Early detection is essential to offer effective multidisciplinary input and reduce morbidity, in particular preservation of renal function<sup>1</sup>. Gestational diabetes is a recognised risk factor for this condition<sup>1</sup>.

**Conclusion:** Children presenting with severe constipation from early on in life ('red flag sign')<sup>2</sup> are likely to have an underlying organic pathology such as Hirschsprung's disease or a spinal cord abnormality and should be referred to a specialist<sup>2</sup>. This case clearly illustrates the importance of taking a careful clinical history and thorough physical examination before a diagnosis of idiopathic constipation is made.

**Fig 1:** Abnormal small, flat buttocks. Clinical appearance in sacral agenesis. Note sacral defect.

**Fig 2:** T2 Sagittal image showing truncated cord at the level of T12/L1 and partial sacral agenesis. Patulous anus and mega rectum are also evident.

**Fig 3:** Supporting axial image.

## Poster 36

### **Boerhaave's Syndrome- a differential diagnosis of acute chest pain following vomiting illness.**

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**Background:** Spontaneous oesophageal rupture (Boerhaave syndrome) is extremely rare in children. Presentation is usually in middle aged men as a result of vomiting following heavy food or alcohol consumption. We describe an unusual case of a 12 year old boy without significant past medical history presenting with acute chest pain following gastroenteritis.

#### **Case History: (2 images to include)**

12 year old boy presented with a five day history of vomiting and diarrhoeal illness. He also had shortness of breath, sore throat, jaw pain and chest pain for 48 hours. He had two

minor episodes of haematemesis in this 48 hour period. He was unable to open his mouth to communicate or take food due to severe discomfort. There was no significant past medical history. On initial assessment he was very tachycardic, tachypnoeic and dehydrated needing fluid resuscitation. An urgent chest radiograph performed showed pneumo-pericardium and pneumo-mediastinum. There was also surgical emphysema in the cervical prevertebral soft tissues which has extended superiorly from the pneumomediastinum

Boerhaave's syndrome (BS) was diagnosed based on the clinical history and radiographic findings. He was managed conservatively with prophylactic intravenous antibiotics, nasogastric tube for 'drip and suck' and was kept nil by mouth. The patient made a full recovery and was discharged a week later with no complications. He had an oral GI contrast study before discharge from the ward and three weeks later which showed no leak of the contrast into the mediastinum. However this will not exclude the diagnosis given his clinical history at presentation and chest radiographic appearance.

**Discussion:** BS is a non iatrogenic transmural rupture of oesophagus that is commonly preceded by forceful vomiting. The most common site of rupture is in the distal oesophagus along the left posterior-lateral wall (anatomical point of weakness)<sup>2</sup>. This condition is more common in adult male patients and is rarely reported in children. The condition carries a 20-40% mortality rate if not identified and treated early<sup>1</sup>. Diagnostic modalities used are plain chest radiograph, upper GI contrast study and CT scan with oral contrast<sup>1</sup>.

Multiple treatment modalities have been described in adult case series which include exclusive conservative measures, endoscopic treatment (using self expandable metal stents +/- additional surgical intervention) or extensive surgery<sup>1</sup>. The choice of treatment depends on timing of presentation, associated complications identified and clinical state of the patient<sup>1,5</sup>.

**Conclusion:** Boerhaave syndrome should be included in the broad differential diagnosis in patients presenting with acute chest or epigastric pain, dyspnoea, sub cutaneous emphysema or haematemesis following a vomiting illness<sup>3,4</sup>.

**Determinants of 1st hour initiation of breastfeeding in infants attending the paediatric outpatient department of a semi-urban hospital in Bangladesh.**

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**Background:** Universal initiation of breastfeeding within an hour of birth will save 37,000 newborns lives and 52,000 under 5-lives every year which will reduce under-5 mortality rate by over 20%. The 1st hour initiation of breastfeeding was 43% in Bangladesh in 2007. It is important to study the determinants of this life saving behaviour so that interventions can be designed to increase its prevalence to 100%.

**Objective:** To describe the determinants of breastfeeding initiation within one hour of age in infants attending the paediatric outpatient department of a semi-urban health centre in Bangladesh.

**Methodology:** In this cross-sectional study, randomly selected 150 mothers of infants from the outpatient department of the Centre for Woman and Child Health (CWCH) during October 2008 were interviewed to collect information on socio-demographic factors, breastfeeding practices and factors affecting breastfeeding practices by a structured questionnaire.  $\chi^2$ -test was done to compare the initiation of breastfeeding within 1 hour and more than 1 hour. Prior to the interview, permission was taken from mother. Codes were used to maintain confidentiality and anonymity.

**Results:** Seven percent fathers were illiterate and 69% were garments worker when 7% mothers were illiterate and 89% were housewives. Most of the families (75%) were nuclear, average family size was 5 and 73% families were living in rented houses. Mothers' mean age was 23 years, age at marriage was 17.5 years and age at first child birth was 20 years. Mean age of the children was 3.7 months (SD 2.7), 56% babies were male and 44% were female, mean birth order was 1.45. Initiation of breastfeeding within 1st hour was 43% and it is significantly associated with normal delivery (88% vs. 67%,  $p < 0.005$ ), delivery conducted by nurse or trained birth attendants (48% vs. 25%,  $p < 0.005$ ) and 1st feed was breast milk (72% vs. 42%,  $p < 0.00$ ). Major cause for delayed breastfeeding initiation within 1st hour mentioned by the mother was mothers' sickness (65%).

**Discussion and Conclusion:** This study finding indicates the urgent need to promote breastfeeding counselling and training which will ensure the 1st hour breastfeeding.

**Acknowledgements:** Centre for Woman and Child Health (CWCH)

**A Global e-Health system.**

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The Swinfen Charitable Trust (SCT) has operated a low-cost email telemedicine system to support doctors in developing countries since mid 1999.

SCT uses simple web based system to connect remote hospitals and doctors with expert medical opinion and advice. Many of these hospitals are understaffed and have no highly qualified doctors, some operating with lone general practitioners in charge, and could be a day's travel or more away from other hospitals with better facilities.

The network has now been operational for 12 years , making it one of the longest-running such telemedicine systems, i.e.operated for charitable purposes and dealing mainly with clinical work. Around 42 gastroenterology referrals have been managed during this time, and 25 in hepatology. For the first three years, email messages were handled manually; subsequent operations have benefited from an automatic message-handling system. This unique system was developed for SCT by Professor Richard Wootton working firstly at the Centre for Online Health at the University of Queensland, Australia and secondly at the University of Northern Norway. It archives all messages and ensures that a request for advice and the subsequent response pass between the remote hospital and the relevant specialist. The systems operators situated in UK and Norway provide an (almost) 24 hour service.

Some of the countries utilizing these links, such as Iraq, and Afghanistan are passing through conflict and post-conflict situations. Amongst other countries using SCT Telemedicine links, are Pakistan (recent floods) Bangladesh, Cambodia, Sri Lanka, Uzbekistan, Ethiopia, Sudan, and most recently, China and Tibet. SCT can obtain specialist advice in all specialties and sub-specialties.

**Lord and Lady Swinfen. Founders and Directors.**

## **Newborn breastfeeding behaviour immediately after delivery in a semi-urban hospital in Bangladesh**

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**Background:** Breastfeeding initiation in the 1<sup>st</sup> hour of life reduces neonatal mortality by 30%. In addition, 1<sup>st</sup> hour initiation promote uterine contraction, milk ejection, and mother-infant interaction. Labour Delivery Room (LDR) and caesarean operation theatre (OT) personnel at the Centre for Woman and Child Health (CWCH) in Savar, Dhaka routinely attempt to help the delivered newborn to initiate breastfeeding within one hour of birth. We wanted to systematically describe pre-breastfeeding behaviour in these hospital delivered newborns.

**Objectives:** To describe breastfeeding behaviour in 100 newborns delivered at CWCH between 22<sup>nd</sup> October 2008 and 5<sup>th</sup> February 2009.

**Methodology:** Trained Paediatric department doctors filled out a structured questionnaire immediately after delivery at the CWCH LDR or caesarean OT. Information collected, apart from newborn breastfeeding behaviour, included maternal OBGYN factors, newborn resuscitation details and newborn physical examination findings. Family socio-demographic information was also collected. Prior to conducting the interview informed verbal consent was taken from mothers after explaining the study.

**Results:** Over 3½ months period 100 mothers delivered at the CWCH, 99 of them and 93 of their husbands had at least primary education. Over 40% of husbands had a regular job, almost 30% were traders and 15% were farmers. The mean family size was 4.3. The mean age of mothers was 23.5 years, over 97% of the 85 mothers with anthropometry data had a BMI >18.5 and over 74% had a BMI>22.9. Sixty percent of mothers were primiparous and 79% of them had a caesarean delivery (CD) – 22% due to failure to progress in labour, over 20% due to foetal compromise, 10% due to obstructed labour and close to 8% had a previous CD. Almost 95% of newborns had an Apgar score of 7 or more. Newborns mean gestational age was 37.2 weeks and mean birth weight was 2790 g. Babies were first placed skin-to-skin with their mothers at a mean age of 8 minutes and first suckling took place at about 13 minutes.

**Discussion and conclusions:** It is possible to start breastfeeding with 15 minutes in all hospital deliveries in a resource poor setting even when the delivery is by caesarean section.

**Acknowledgements:** <sup>1</sup> MOSICT, Bangladesh. <sup>2</sup>GK, Dhaka, Bangladesh.

**The impact of nutrition education on exclusive breastfeeding for positive nutritional outcome of low birth weight babies**

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**Introduction:** About 40% of neonates are born with Low Birth Weight ( $\leq 2500$ gm) in Bangladesh. Globally, more than 30 million infants, about 23.8% of all infants, are born with low birth weight. The objective was to see the effect of exclusive breastfeeding on weight gain of LBW babies compared to non education group.

**Methodology:** Total 184 pairs of LBW babies and their mothers were randomly selected from two hospitals in Dhaka city. Nutrition education was given 2 weekly for 2 months on food habit, early initiation and exclusive breastfeeding to the education group. The nutritional status of LBW babies were assessed for 2 weeks for growth.

**Result:** The mean initial birth weight and length were comparable ( $2270 \pm 182$ g vs.  $2236 \pm 262$ g,  $p=0.316$  and  $43.0 \pm 1.3$ cm vs.  $43.0 \pm 1.7$  cm,  $p=0.77$ ). The weight and length of LBW babies increased significantly in both groups ( $4366 \pm 296$ g vs.  $3563 \pm 346$ g,  $p<0.001$  and  $50.2 \pm 1.3$  cm vs.  $48.7 \pm 1.6$  cm,  $p<0.001$ ). The rate of early initiation and exclusive breastfeeding were higher in education group compare to non education group ( $59.8\%$  vs.  $37.2\%$ ,  $p<0.001$  vs.  $48.9\%$  vs.  $43.5\%$ ,  $p=0.459$ ). Infants of education group suffer less from respiratory illness compared to non education group ( $39\%$  vs.  $66\%$ ,  $p<0.001$ ).

**Conclusion:** Exclusive breastfeeding has a dynamic effect to increase weight and length of LBW babies of education group compared to the control group.

**Acknowledgement:**

We gratefully acknowledge the participation of the study.

**Randomized controlled trial to assess the effect of psychosocial-stimulation on development of iron deficient anaemic and non-anaemic young children**

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\*Dr John Beard (1947- 2009), was our collaborator in this work but his untimely death did not allow him to see the conclusion of the study. We respectfully acknowledge his contribution.

**Background:** Iron deficiency anemia (IDA) is associated with poor infant development Iron-supplementation mainly benefits motor function and children with IDA generally do not catch up to non-anemic (NA) children. The addition of psychosocial stimulation may facilitate catch up.

**Objective:** To compare the effects of psychosocial-stimulation, on cognitive and motor development, of IDA and NA children.

**Methodology:** This cluster-randomised controlled trial was conducted in 30-villages (15 stimulation and 15 control villages) in Bangladesh. All available 1237 children, aged 6-24 months, were screened for IDA. Total 223 children from stimulation-villages (117 IDA and 106 NA) and 211 children from control-villages (108 IDA and 103 NA) –were enrolled. All IDA children received daily iron-treatment for 6 months. Stimulation comprised 9 months of weekly play sessions at home. We assessed children's development at baseline and after 9 months using Bayley Scales of Infant Development-II and stimulation in the home with the Family Care Indicators (FCI).

**Results:** Iron treatment benefitted anemia and iron status. After receiving iron-treatment non-stimulated IDA and NA groups had similar MDI scores but the IDA group had lower PDI scores. Stimulation significantly improved children's mental development index (MDI) (multiple regression analyses;  $B \pm se$  5.9 $\pm$ 1.9; 95% CI 2.0, 9.6,  $p=0.003$ ). The interaction between iron status and stimulation on change in MDI approached significance. NA children significantly benefitted from stimulation (5.3 $\pm$ 1.9; 95% CI 1.5, 9.1;  $p=0.007$ ) whereas IDA group did not (1.3 $\pm$ 1.8; 95% CI -2.3, 5.0;  $p=0.47$ ). Stimulation improved the FCI in both groups (1.5 $\pm$ 0.3; 95% CI 0.5, 1.8;  $p=0.001$ ).

**Discussion and Conclusion:** With iron treatment alone, the IDA group caught up to the non-stimulated NA group in MDI but not PDI. There was an overall benefit from

stimulation on children's mental development but the IDA group tended to improve less than the NA group in spite of similar improvements in home stimulation.

**Acknowledgements:** Nestle Foundation

**Poster 42**

**A randomized controlled trial of three different supplemental foods in the treatment of moderate acute malnutrition**

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**Background:** Optimal cost-effective therapy for moderate acute malnutrition (MAM), which accounts for 10% of under-five mortality, remains to be determined.

**Objective:** To test a new fortified flour (CSB++), a locally-produced soy ready-to-use supplemental food (RUSF), and a commercially produced soy/whey RUSF in the treatment of MAM.

**Methodology:** This prospective, randomized, investigator-blinded trial in Malawi enrolled children 6-59 months old with MAM, defined as weight-for-height Z-score (WHZ) < -2 and  $\geq$  -3 without oedema. Children received 75 kcal/kg/d of one of three supplementary food products in two week rations as outpatients. CSB++ contains corn flour, soya flour, 3% soya oil, 8% dried skimmed milk, 9% sugar, and concentrated minerals and vitamins. The primary outcome was recovery from MAM or failure (death, development of severe acute malnutrition, transfer to inpatient care, continued MAM after 12 weeks, default). Secondary outcomes included growth rates and time to graduation. Chi-square and ANOVA compared outcomes between different food groups. Ethical approval was obtained from Washington University and the University of Malawi.

**Results:** Among the 2712 participants, there were no reports of adverse reactions. Rates of recovery were similar for all three foods: CSB++, 763/888 (86%); soya RUSF, 795/906 (88%); soya/whey RUSF, 807/918 (88%). Mean duration until recovery was 23 days. Children on CSB++ took two days longer to recover compared to either RUSF. Children on soya/whey RUSF had a greater rate of weight gain compared to CSB++ (3.6 v. 3.1 g/kg/d), and a greater rate of MUAC gain compared to the other foods (0.21 v. 0.13 mm/d).

**Discussion and Conclusion:** Children receiving any of these three supplementary foods had similar rates of recovery, which for CSB++ was remarkably higher than for other blended flours used previously. Given its lower cost, strong consideration should be given to CSB++ as the preferred therapy for children with MAM.

**Acknowledgements:** The study is made possible by the generous support of the American people, through the Office of Health, Infectious Disease, Nutrition, Bureau of Global Health, and Office of Foreign Disaster Assistance (OFDA), United States Agency for International Development (USAID), under the terms of Cooperative Agreement No. GHN-A-00-08-00001-00 through the FANTA-2 project operated by AED. CSB++ was donated by the World Food Programme, Rome, Italy; soya RUSF was donated by Project Peanut Butter, Blantyre, Malawi; soya/whey RUSF was donated by Nutriset, Malaunay, France. Dr. Trehan is supported by the NIH under Ruth L. Kirschstein National Research Service Award T32 HD049338.

**Poster 43**

**Management of term jaundiced babies –a comparative review of two epochs in a tertiary neonatal unit in a DGH**

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**Background**

**EPOCH 1 ( June-August 2007 ) :** Prior to September 2007, a formula was used to assess the level of jaundice needed phototherapy (**Gestational age x 10 –100**),

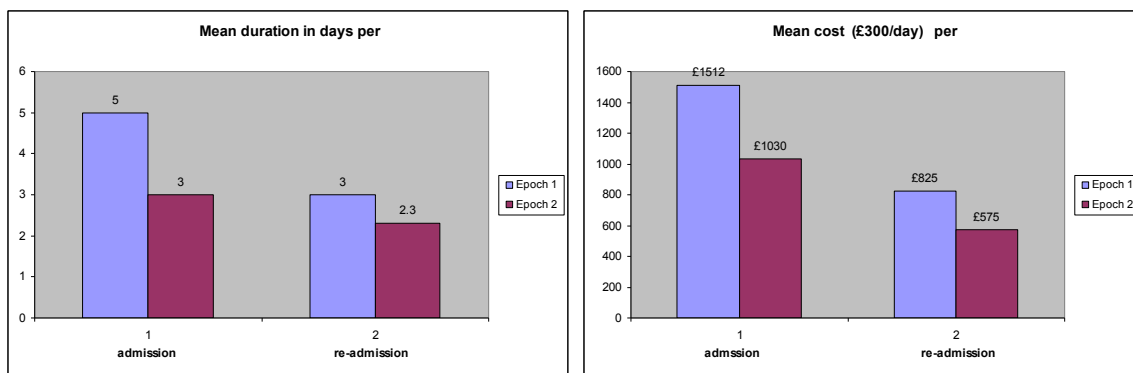
**EPOCH 2 ( June-August 2008) :** In September 2007, the new bilirubin charts were introduced



- originally 34 babies were identified
- For 6 babies, notes not found or were preterm
- 12 re-admissions , of which 4 NICU admissions
- 2 cases had no phototherapy
- in 3 cases, SBR ( serum bilirubin ) charts were used and as a result in one case phototherapy was avoided

## EPOCH 2

- Originally 39 babies were identified
- For 15 babies , the notes were not found or were preterm
- 12 re-admissions, of which 3 were NICU admissions
- 5 cases had no phototherapy



## Conclusions

### EPOCH 1

- Some babies were having 5-10 further SBR tests below the line before SBR testing ceased
- Babies being treated with phototherapy were well below even these treatment levels
- At least 13 cases (40%) could have avoided phototherapy if the bilirubin chart had been used
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### EPOCH 2

- Reduced duration of admission and phototherapy (45% less )
- 27% less SBR measurements
- Resulted in less occupied beds in transitional care (around 40% less cost)
- Reduced the workload of postnatal wards staff.

**We clearly demonstrated a significant cost saving by the use of our bilirubin charts.**

## **Ileal intubation Audit**

**Manjula Velayudhan, Arun Urs, Mike Thomson.**

### **Sheffield Children's Hospital**

**Introduction :** Sheffield Children's Hospital is a supra-regional centre for gastroenterology and therefore undertakes ileo-colonoscopy as standard. As the recognised UK and European Training Centre for Paediatric Endoscopy it is expected that there is a high success rate of ileal intubation. Audit of this practice therefore occurred with an end point of ileal intubation, and if not achieved what the reasons were, in order to improve service provision. Although it is well recognised that ileal intubation allows differentiation between ulcerative colitis (UC) and Crohn's disease (CD) in 8-15% of cases we felt it important to look again at this aspect of care.

#### **Aims:**

1. Retrospective audit of ileal intubation success;
2. Audit of any technical difficulties associated;
3. Assess if ileal intubation offered any advantages over routine colonoscopy in detecting ileal changes in Inflammatory bowel disease thus offering diagnostic differentiation between UD and CD.
- 4.

**Methods :** Retrospective analysis of 74 case notes selected randomly of colonoscopy and ileal intubation performed by 3 experienced colonoscopists between 2008 and 2010. Ileal intubation was confirmed by histology.

#### **Results :**

1. Ileal intubation occurred in 89% of colonoscopies(65/74).
2. Technical difficulties were encountered in 9 (12%), out of which 6 were due to poor bowel preparation ,whereas 3 were due to severe colitis when it was deemed unsafe to continue due to bleeding.
3. Ileal ulceration/ileitis was found in 6/74 (8%) patients, of which 4/74 (5%) also had findings on colonoscopy. Hence only two patients (3%) had ileal findings which were not found on colonoscopy alone, however histological differentiation occurred in 2 other patients( 3 %) due to ileal intubation .

#### **Conclusion**

There remains an imperative for ileal intubation and biopsy in the initial assessment of IBD in order to allow IBD sub-type differentiation. Only strictures or severe colonic faecal overload should now be preclusions to full ileo-colonoscopy in children.