12 scores were analysed using an analysis of covariance model. The IBS-QOL response rates (ie, patients with ≥10-point and ≥14-point increase) for the treatment groups were compared using Cochran-Mantel-Haenszel stratified by geographical region.

Results The changes from baseline in the IBS-QOL "overall" score and seven of the eight subscale scores (Dysphoria, Body Image, Health Worry, Food Avoidance, Social Reaction, Sexual and Relationships) were statistically significant for linaclotide-treated patients vs placebo-treated patients ($p<0.0001$ for each comparison). The percentage of responders for the IBS-QOL "overall" score was statistically significantly greater for linaclotide-treated patients vs placebo-treated patients at week 12 (64.3% linaclotide-treated patients vs 52.6% placebo-treated patients for ≥10-point change; 53.8% linaclotide-treated patients vs 39.1% placebo-treated patients for ≥14-point change). The most common adverse event among linaclotide-treated patients was diarrhoea.

Conclusion Compared with placebo, once-daily linaclotide treatment for 12 weeks significantly improved "overall" QOL scores and seven out of eight important QOL domains, as measured by the IBS-QOL, in adults with IBS-C.

Competing interests R T Carson Employee of: Forest Research Institute, S Tourkodimitris Employee of: Forest Research Institute, B E Lewis Employee of: Ironwood Pharmaceuticals, J M Johnston Employee of: Ironwood Pharmaceuticals.

PWE-128 REVIEW OF SEHCAT USE AT ST. GEORGE'S 2005–2010: AN UNDERUTILISED INVESTIGATION?

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Introduction Bile acid malabsorption (BAM) is a frequently overlooked but easily treatable cause of chronic diarrhoea. The SeHCAT study is a simple non-invasive technique for diagnosing this condition. Three types of BAM are described. Type 1 is seen in patients with terminal ileal disease/resection or bypass. Type 2, known as primary or idiopathic BAM, is characterised by lack of discernable change in ileal histology or obvious clinical history or pathology to account for the malabsorption. Type 3 comprises all other causes of BAM including gastric surgery, pancreatitis, cholecystectomy or associated with microscopic colitis, coeliac disease, diabetes and small bowel bacterial overgrowth.

Methods Retrospective review of all SeHCAT studies performed between 2005 and 2010 at St George's Hospital.

Results Between 1 January 2005 and 31 December 2010 55 SeHCAT studies were performed. Basic details were available on all 55, however only 44 sets of notes were available. 36 (65%) patients were female and 19 were male. Age ranged from 19 to 77 years old. 62% of studies were abnormal showing <15% retention at 7 days. Of these 11 (32%) demonstrated mild BAM, 8 (24%) moderate BAM and 15 (44%) severe BAM. Of the 34 patients with BAM 28 sets of notes were available. 10 (36%) had Type 1, 8 (29%) had Type 2 and 10 (36%) had Type 3 BAM. In those with proven BAM 46% underwent a trial of bile acid sequestrant (BAS). 88% of patients with follow-up details had good resolution of their symptoms. Response rates to treatment ranged between 60 and 100%. Six of the 10 type 1 BAM subjects had a trial of BAS; follow-up details are only available on 3, 2 of whom had noticed an improvement in symptoms (66%). Six of the 8 type 2 BAM subjects had a BAS, follow-up details are available on 5, 3 of whom had improvement of their symptoms (60%). Four of the 10 type 3 BAM subjects had a BAS, at follow-up details are only available on three all of whom had a good response (100%).

Conclusion As chronic diarrhoea is a common reason for GI referral, the small number of studies performed over a 5-year period suggests that SeHCAT is probably underused and bile acid malabsorption under diagnosed. As bile acid sequestrants provide good symptomatic relief, bile acid malabsorption is a useful diagnosis to make.

Competing interests None declared.

PWE-129 SHOULD SEHCAT BE EARLIER IN THE ALGORITHM FOR INVESTIGATING CHRONIC DIARRHOEA?

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Introduction Bile acid malabsorption (BAM) is a potentially underrecognised cause of chronic diarrhoea. An accurate diagnostic technology exists in the form of the SeHCAT (^{75}Se—homotaurocholate) test. The British Society of Gastroenterology investigation algorithm places SeHCAT as a very late stage investigation, but if BAM is common or SeHCAT unavailable it may easily be overlooked. This is a treatable condition: the response to bile sequestrants as an empirical "investigation" is not an adequate approach. This study aimed to characterise the results of SeHCAT in a large cohort of patients, and also to determine how well adhered to were the British Society of Gastroenterology guidelines for the investigation of chronic diarrhoea.

Methods The electronic records of 276 patients who underwent SeHCAT scanning between 2005 and 2011 were retrospectively analysed as a medical student project.

Results Bile acid malabsorption (BAM) was very common in patients who underwent SeHCAT testing, found in 110 (40%) of the 276 patients. In the overall cohort, 136 patients had no prior underlying disease or surgery recorded that might cause diarrhoea, and 86 of these displayed no abnormalities on full screening including endoscopies and coeliac tests. Of the 110 with BAM, 28 had undergone neither endoscopy nor coeliac screening. Predictably, 22 of the 26 (85%) Crohn's patients with a history of ileal resection had positive results, as did 15 of the 21 (71%) ileally resected patients who did not have Crohn's disease. Sixteen patients (55%) with post-cholecystectomy diarrhoea showed evidence of BAM.

Conclusion BAM is common in subjects undergoing SeHCAT. The current guidelines should be revised to take into account BAM as an important and common cause of diarrhoea, with SeHCAT earlier in the process. It is apparent that clinicians are not widely using the BSG algorithm, presumably using clinical judgement in patients in whom BAM seems likely, and, for example, opting not to undertake colonoscopy in many cases. In the absence of a terminal ileum, the BAM diagnosis is almost universal and the test is probably superfluous. A broader and contemporary health technology assessment including all patients currently investigated for chronic diarrhoea is now required in order to define a new algorithm.

Competing interests None declared.

PWE-130 THE HUMAN GUT MUCOSAL COGNATE CELLULAR RESPONSE TO LIVE ORAL TYPHOID VACCINATION

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Introduction The human gut mucosal cellular response to oral vaccination has never been directly assessed. We studied the cognate cellular immune response to the live oral typhoid Ty21a vaccine in the gut mucosa of human volunteers, and compared it with that seen in peripheral blood.

Methods 27 healthy volunteers were randomly assigned to a vaccinated (n=14) or a control (n=13) group for Ty21a typhoid vaccine. Peripheral blood was collected from all volunteers prior to vaccination and 18 days following immunisation or recruitment. Mucosal samples (15 jumbo biopsies from duodenum (n=25) ± colon (n=18)) were collected from all volunteers at gastroscopy +/− sigmoidoscopy on day 18. Mononuclear cells were isolated from mucosal tissue by disruption and collagenase digestion, and from blood by differential centrifugation. Cells were stimulated with Ty21a or control antigens, and stained for surface phenotype and intracellular cytokine production. Antigen-specific IFN-γ, TNF-α, and IL-2 production was determined by flow cytometric analysis for $CD3^+/CD8^+$ and $CD3^+/CD8^-$ ($CD4^+$) lymphocytes. Humoural IgA, IgM and IgG responses in blood were examined in relation to mucosal and peripheral cellular responses.

Results Oral immunisation with Ty21a significantly increased the proportion of antigen-specific cytokine-producing CD8-positive ($p<0.05$) and CD8-negative ($p<0.05$) lymphocytes within the duodenal mucosa, but no specific response was seen in colon. CD8-negative lymphocytes within the duodenal mucosa adopted a significantly more poly-functional phenotype following vaccination, expressing 2 or 3 cytokines simultaneously, while in contrast antigen-specific cytokine-producing CD8-positive lymphocytes in the duodenal mucosa were mono-functional expressing a single cytokine. In blood, the proportion of antigen-specific cytokine-producing CD8-positive lymphocytes was increased ($p<0.05$) following oral vaccination, but there was no significant increase in cytokine-producing CD4-positive lymphocytes. Differences in functionality of antigen-specific cytokine responses were less marked in peripheral blood lymphocytes following vaccination.

Conclusion These data show an antigen-specific response in human gut mucosal lymphocytes following oral vaccination, and directly demonstrate different immune functionality of CD8-positive compared to CD8-negative mucosal lymphocytes. These responses were more informative than surrogate measurements in peripheral blood lymphocytes. The absence of a detectable cognate response from the colon may indicate compartmentalisation of the gut mucosal response to the embryological mid-gut, where typhoid antigen is likely presented at immune inductive sites.

Competing interests None declared.

PWE-131 PROPOFOL DEEP SEDATION FOR SMALL BOWEL ENTEROSCOPY IN ELDERLY PATIENTS IN A WORLD GASTROENTEROLOGY ORGANISING ENDOSCOPY TRAINING CENTER IN THAILAND

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Introduction The aim of the study is to compare and evaluate the clinical efficacy of propofol deep sedation (PDS) for small bowel enteroscopy (SBE) procedure in elderly patients in a teaching hospital in Thailand.

Methods This study was a retrospective study. All SBE patients were classified into two groups by using age: group 1 (Age <65 years) and group GA (Age ≥65 years). The primary outcome variable of the study was the successful completion of the procedure. Failed procedure is defined as the procedure can not be completed by using PDS technique or sedation-related serious adverse events such as severe hypoxaemia, severe cardiorespiratory instability, are occurred. The secondary outcome variables were sedation-related complications, haemodynamic parameters and mortality rate.

Results 116 patients underwent SBE procedures by using PDS technique. Premedications were none before the procedure. After matching gender, weight, ASA physical status and indications of procedures, there were 45 patients in group 1 and 28 patients in group 2. There were no significant differences in gender, weight, height, ASA physical status and indications of procedures among the two groups. All procedures were successful completion but one in group 1. Mean dose of propofol, fentanyl and midazolam in both groups was comparable. There were no significant differences in the complication rate, mortality rate and haemodynamic parameters between the two groups.

Conclusion In the setting of developing country, PDS for SBE procedure in elderly patients by experienced anaesthesiologist with appropriate monitoring were relatively safe and effective. Sedation-related complications in elderly patients are relatively higher than in the younger patients, but not significantly different.

Competing interests None declared.

PWE-132 ENHANCED EXPRESSION OF SECRETORY PHOSPHOLIPASE A2 AND CRYPTDINS IN SMALL INTESTINAL PANETH CELLS FOLLOWING *TRICHINELLA SPIRALIS* INFECTION

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Introduction *T spiralis* infection leads to a T cell-dependent enteropathy characterised by villus atrophy, crypt hyperplasia and an increase in Paneth and goblet cells. Paneth cells express a number of antimicrobial peptides and proteins. Our aim was to investigate changes in the expression of cationic antimicrobial peptides and proteins that are normally expressed by Paneth cells.

Methods Small intestinal epithelial cells were isolated from control mice and those infected with *T spiralis*. Concentrated cell extracts (in acetic acid) were studied by acid urea-polyacrylamide gel electrophoresis (AU-PAGE) and Western blot analysis. Samples with similar protein concentrations were used to assess antimicrobial activity against *Escherichia coli*, after 5 h of incubation at 37°C, using the following equation: antimicrobial activity = [(OD620 of control solution−OD620 of sample)/OD620 of control solution] ×100.

Results The establishment of infection with the nematode was confirmed by the presence of worms in the small intestinal lumen, changes in mucosal architecture and increase in Paneth and goblet cell numbers. In contrast to controls, AU-PAGE analysis of Paneth cell-containing small intestinal epithelial cell extracts from *T spiralis*-infected mice showed two prominent bands. AU-PAGE-Western blot and amino acid sequence analyses identified one of these bands to be secretory phospholipase A2. Sequences for cryptdins were detected in the second prominent band. Acid extracts of epithelial cells isolated from *T spiralis*-infected mice showed significantly greater antimicrobial activity, compared to those from control mice [mean 54.7 (SEM 8.7)% vs 7.3 (3.5)%; p=0.001].

Conclusion Following *T spiralis* infection, there was an increase in small intestinal epithelial expression of secretory phospholipase A2 and cryptdins. Enhanced production of these Paneth cell-derived peptides is likely to mediate greater antimicrobial activity against luminal bacteria in *T spiralis*-infected small intestine.

Competing interests None declared.

Hepatobiliary II

PWE-133 INCREASED LEVELS OF NEUTROPHIL GELATINASE ASSOCIATED LIPOCALIN (NGAL) IN THE PLASMA OF CHOLANGIOCARCINOMA PATIENTS

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