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Tuesday 25th April 2022

Plenary Abstract Session 1
Gastroenterology

Paediatric IBD patients do not always require switching of monoclonal treatment in presence of TNF antibodies

Chris Roberts, Claire Barnes, James Ashton, Erfrem Eren, Mark Beattie and Nadeem Afzal.
University Hospital of Southampton

Introduction

The PANTS study highlights that secondary loss of response to anti-TNF treatment can be related to low drug levels[1] caused by development of anti-drug antibodies (ADA)[2]. Early therapeutic drug monitoring (TDM) of anti-TNFs with dose optimisation is recommended[3].

Aims

The aim of this study is to have a real-life use of TDM, to understand the role of interventions on ADA and drug levels in a cohort of paediatric IBD patients that have developed ADA.

Subjects and Methods

Paediatric IBD patients on Infliximab, who had TDM were identified from a prospectively held database. All tests that had presence of ADA were included. All TDM was done at the same lab (Exeter) using the same assay. Testing took place between July 2018 and March 2021. The response to TDM was assessed by using the electronic health record at Southampton Children's Hospital.

We assessed the clinical response to the presence of ADA and the effectiveness of the changes on repeat TDM. The therapeutic interventions included were switching to Adalimumab, increased Infliximab dose, reduction in time between doses, increased immunomodulator (Azathioprine or 6-Mercaptopurine) dose or no change at all. The effectiveness of the intervention was assessed by median reduction in ADA and median increase in drug levels. Wilcoxon signed-rank test was performed looking for significant increase in drug level.

Results

20 patients had ADAs. Some of the patients required multiple interventions meaning that some patients were included in multiple analyses. Overall, 39 TDM tests were included over 20 patients. Patient characteristics at diagnosis according to Paris Classification are summarised in table 1. Median time between starting Infliximab after diagnosis was 6 months (IQR 2.75-8.5) and median time between first 1st TDM and starting Infliximab was 12.5 months (IQR 7-20.75).

Table 1 - Characteristics of patients according to Paris Classification

Ulcerative Colitis				Crohn's Disease							
Extent		**Severity**		**Age at Diagnosis**		**Location**		**Behaviour**		**Growth**	
Ulcerative Proctitis E1	0	At least one severe episode S1	2	0-<10 A1a	5	Distal 1/3 ileal ± limited caecal disease L1	2	Non-stricturing and Non-penetrating B1	14	No evidence of growth delay G0	11
Left Sided (to Splenic Flexure) E2	2	Never severe S0	0	10-<17 A1b	15	Colonic L2	4	Stricturing B2	0	Growth Delay G1	7
Extensive (to Hepatic Flexure) E3	0			>17 A2	0	Ileocolonic L3	6	Penetrating B3	3		
Pancolitis E4						Small Bowel Disease L4b	6	Both stricturing and Penetrating B2B3	1		
								Perianal disease modifier p	4		

Summary of interventions below and in table 2:

Patients with ADAs with normal Infliximab level did not require intervention in 9 cases and this did not significantly alter drug levels(p=ns).

Increased Infliximab dose in 9 cases led to a greater increase in median drug levels (4.1 p=0.01) than reduced time between doses in 4 cases (2.9 p=0.07). Both had a similar reduction in ADA. Complete resolution of ADA was seen in 3 cases after escalating anti-TNF dose.

Switching to Adalimumab was performed in response to 6 cases where ADAs were present, all had a very low drug level.

Increased immunomodulator dose done in 5 cases led to a reduction in ADA but no significant change in drug level(p=ns).

Table 2 - Summary of interventions in response to TDM

Therapeutic Intervention	**PATIENTS WITH POSITIVE ANTIBODIES AND LEVELS (n = 20 patients with 39 tests)**			**POST INTERVENTION REPEAT TDM (n=14 patients with 23 tests)**			
	Score	**Median drug level**	**Median antibody level**	**Score**	**Median increase in drug level**	**Median reduction in Ab levels**	**P Value (Wilcoxon Signed-Rank)**
Switch to Adalimumab	6	1.1	44	4	N/A	44	N/A
Increased Infliximab dose	11	3.5	30	9	4.1	11	0.012
Reduced time between Infliximab doses	7	4.0	30	4	2.9	11	0.068
Increase immunomodulator dose (Azathioprine or 6-Mercaptopurine)	9	3.6	37	5	1.1	8	0.225
No change	9	6.9	54	6	0.9	6	0.108
Reduced Infliximab or increased time between doses	3	13.8	53	N/A			

Conclusion

The presence of ADA should always be assessed in the context of levels and interventions maybe considered if levels are low. In our small study, increasing Infliximab dose was more effective than reducing time between doses. Increasing immunomodulator dosage can be used as well. Switching to Adalimumab is an option and works well if drug level is very low, consideration should be given if there is a continued need for anti-TNF.

[1]. Kennedy NA, Heap GA, Green HD, et al. Predictors of anti-TNF treatment failure in anti-TNF-naive patients with active luminal Crohn's disease: a prospective, multicentre, cohort study. *Lancet Gastroenterol Hepatol*. May 2019;4(5):341-353. doi:10.1016/s2468-1253(19)30012-3

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[3]. van Rheenen PF, Aloi M, Assa A, et al. The Medical Management of Paediatric Crohn's Disease: an ECCO-ESPGHAN Guideline Update. *J Crohns Colitis*. Oct 7 2020;doi:10.1093/ecco-jcc/jjaa161

Representation of Inflammatory Bowel Disease on UK television

Andrew Willard[1], Sam Addelman[1], Chris Willmott[2] and Anne Willmott[3]
[1]Leicester Medical School; [2]University of Leicester; [3] University Hospitals Leicester NHS trust
.
Introduction/background:
Children and young people with Inflammatory Bowel Disease (IBD) can be concerned about the life-changing implications of their diagnosis. Previous literature reviews have identified that media representations of living with chronic disease can influence an individual's perception of their own situation. Media content may therefore be a potential tool in helping a young person come to terms with their diagnosis. To our knowledge, however, there is no published literature specifically examining the quantity and quality of broadcast media representations of IBD.

Aim:
To identify UK television programmes referencing IBD, using BoB (an archive of over 2 million recordings) and to review portrayal of IBD, including accuracy of description, and to characterise common themes.

Subjects and methods:

The terms 'Crohns', 'Colitis', 'Inflammatory Bowel Disease', 'Ileostomy' and 'Stoma' were selected, and BoB was searched for TV coverage between January 1st 2019 to December 31st 2020, inclusive.

Each programme was scored from 1 (low) to 10 (high) for (i) relevance to the project, and (ii) accuracy. Those scoring 6 or more for relevance were re-evaluated by a second person, blinded to the first reviewer's exact scores. Emerging themes were identified. Qualitative analysis of the clips was conducted during a subsequent viewing.

Results:

Quantitative analysis:

Table 1 shows the number of programmes identified during the initial search. Emerging themes are presented in Table 2.

Qualitative analysis:

Explanations of IBD: often brief, but mostly accurate. However, programmes often frame living with IBD in extreme terms, either positively and/or negatively.
Positively: benefits of talking openly about living with a chronic condition; strength and resilience of featured participants; focussing on a goal (e.g. in sport, music or dance) can be beneficial to the general wellbeing of individuals with IBD.
Negatively: feelings of fear and helplessness, especially before and around diagnosis; continued uncertainty and daily unpredictability of living with IBD; living with IBD framed as an ongoing "battle".

Summary and conclusions:

IBD is underrepresented on television compared to other chronic conditions. Notwithstanding different search terms may lead to the same programme, there were fewer than 396 IBD-related clips identified in a two-year period. This is significantly lower than other conditions such as diabetes (3,138), asthma (2,236) and epilepsy (959).
Only 58 of the IBD-related clips were assessed as relevant for this project.

Depictions of IBD mainly featured in news, factual medical or documentary programmes with few fictional portrayals in drama or comedy.

Despite focus on the fear and uncertainty of living with IBD, there were also positive messages concerning the value of open communication with family and friends, and having goals to focus on.

Framing living with IBD using more extreme language may be due to television's desire for compelling narratives, rather than an accurate reflection of people's lived experience. However, children and young people with IBD may still benefit from seeing well-known role models discussing their condition and achieving their ambitions despite the challenges. Further research into use of and benefit of TV and social media in support and education should be considered.

Table 1: Number of television programmes matching each search term (original search)
Table includes all matches to given term, and is not adjusted for overlap where more than one search led to the same programme.

Search term	Total programmes in two-year period	"Relevant" clips (score >6)
Crohns	189	43
Colitis	92	18
"Inflammatory bowel disease"	32	6
Stoma	71	4
Ileostomy	12	6

Table 2: Themes identified within "relevant" programmes
Classifications relate to the final non-overlapping list (n=58), but a given programme may feature in more than one category.

Term	Description	Number of programmes
REAL	Someone on a reality TV programme mentions their IBD	12
MED	A factual / reality medical programme shows IBD	13
FAM	A "famous" person is interviewed and discusses their IBD	11
MAG	A TV magazine programme has a section about an IBD-related issue	7
DOC	A documentary with main focus of IBD or related issue	10
NEWS	A news programme	13
HOLB	A medical drama mentioning IBD	6
COVID	A person with IBD is featured in the context of the impact of the pandemic on people with chronic conditions	7
AMY	Documentary, interviews etc with *Strictly Come Dancing* performer Amy Dowden	4
CIRCLE	Episodes of The Circle and subsequent interviews featuring contestant Georgina Elliott, with IBD and previously a stoma	2
DRAMA	NON medical drama or comedy with IBD mention	1

Pneumatosis intestinalis in children: Risk factors and prognosis

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Introduction:
Pneumatosis intestinalis (PI) is a rare condition in childhood and the aetiology is poorly understood. Whilst the majority of children makes a full recovery, the outcome is poor in some. Consensus how to manage these patients is lacking[1].

Aim:
Review of associated risk factors, clinical presentations, and outcome of PI in the paediatric age group.

Subjects and methods:

All patients (> 1 month of age) with radiological evidence of PI identified from the radiology database (1991 to 2021) at tertiary children's hospital were included. Patient records were reviewed retrospectively: Diagnosis, clinical presentation, feeding history, radiological & laboratory findings, management, and outcome were identified. Poor outcome was defined as loss of enteral autonomy, or death within one month of diagnosis of PI.

Results:
Thirty-one patients (21 male, 67.7%) were included, with median age of five years (3 months -15 years). The underlying diagnosis was heterogenous. Cerebral palsy and acute lymphocytic leukaemia (ALL) were most common (5/31 for each, 16.13%). Twelve patients (38.7%) developed PI 2-15 months post BMT. Most patients (n= 15, 48.4%) had no pre-existing gastroenterological disorder; 7/31 had gut GVHD (22.6%), 3/31 (9.7%) were receiving ECMO. In the majority of patients (11/31, 35%) PI was an incidental finding. Abdominal pain was the most common presentation in symptomatic patients (7/31, 22.6%). Mode of feeding was variable: 11/31 (35.5%) oral diet, tube feeding 11/31 (35.5%), combination of oral/tube feeding 7/31 (22.4%) and no enteral intake 2/21 (6.4%). PI was diagnosed radiologically in all patients, 3/31 (9.7%) had additional portal venous gas, 2/31 (6.5%) pneumoperitoneum, and 2/31 (6.5%) pneumopericardium. Eighteen patients (58.1%) received steroids at time of diagnosis. All children (31/31, 100%) were managed conservatively with gut rest (median duration 9 days, range 3-21 days); 19/31 (61.3%) required parenteral nutrition. Twenty-five patients (80.6%) made a full recovery. Six (19.4%) patients (3/6 post BMT) had a poor outcome (1/31 permanent feeding intolerance, 5/31 died). When comparing patients who did well (group 1) to those with a poor outcome (group 2) worse prognosis was associated with a lower platelet count (median group 1: 237, group 2: 84.5 ;P value: 0.016), raised CRP (median group 1: 4.5, group 2: 53 ; P value: 0.008), higher creatinine (median group 1: 24, group 2:32; P value: 0.006) and urea (median group 1: 3.2 , group 2: 5.4 ; P value: 0.013).

Summary and Conclusion:

The overall prognosis of PI in childhood is good, but associated with significant morbidity and mortality in a small number of patients. Our data suggest that lower platelet count, higher urea, creatinine, and CRP levels might risk factors. Unlike previous reports the incidence amongst children undergoing BMT was low.

References:
[1]Nellihela L et al. Management of pneumatosis intestinalis in children over the age of 6 months: a conservative approach. Arch Dis Child 2018; 103(4): 352-355

HLA-typing as a cost effective screening test for Coeliac Disease in children with Down Syndrome.

Timothy Lewis[1], Jill Yates,[2] Rod Mitchell[3], David Turner[3], Hattie Chambers[4], Claire Sumner[1], Sarah Clegg[1] and Peter Gillett[1].
[1]Royal Hospital for Children and Young People, NHS Lothian; [2]St John's Hospital,Livingston, NHS Lothian; [3]Queen Margaret Research Institute, University of Edinburgh; [4]SNBTS Histocompatability and Immunogenetics Laboratory, RIE, Edinburgh; [#]

Background: Children with Down Syndrome (DS) are at increased risk of coeliac disease (CD). Current screening practice in DS includes tissue transglutaminase IgA (TGA-IgA) serology. There is no standard UK guidance on frequency of serology testing or inclusion of HLA-typing for CD predisposing antigens, DQ2 and DQ8. HLA testing can be performed before gluten exposure and to coincide with other routine investigations. A negative DQ2/DQ8 type means patients do not require further coeliac screening. A positive DQ2/DQ8 type allows risk stratification of patients. We explored the cost-effectiveness and family acceptance of a screening strategy which involved both serology and HLA-typing of children with DS.

Methods: Children in Lothian with DS were screened for coeliac disease using HLA-DQ2/DQ8 typing and IgA-TGA serology as part of an established programme following publication of 2012 / 2013 guidelines from ESPGHAN/ BSPGHAN, seen as 'standard of care'. Data collected included the frequency of HLA DQ2/DQ8, assessed with serology testing. Existing patients with CD were identified as part of analysis of the Lothian DS cohort. The cost of HLA haplotyping in NHS Lothian is £31.16, TGA-IgA £15.92 and Total IgA £3.66.

Results: 127 of 176 children with DS (73%) were screened using DQ typing. One family did not consent to DQ typing or serology. Overall, DQ2/DQ8 antigens were identified in 75 (59%) and 52 (41%) were negative . Patients with known CD who were tested (9 out of 12) were all DQ2/DQ8 positive. TGA-IgA serology was performed in 143 of 176 (82%) with a median number of tests per patient of 1. Compared to only TGA-IgA screening, there was an estimated saving of £3.37 per patient.

Conclusions: A significant minority (41%) of DS children are negative for CD-predisposing HLA genotypes and are therefore excluded from further screening. DQ typing is a cost-effective CD screening strategy and was generally well received. In addition to the modest saving in laboratory costs, there will be further benefits from reduction in frequency of serology screening: reduced hidden costs within phlebotomy, diminished pressure on health services, and savings to families of both expense and time. A negative DQ type also excludes a significant condition for families dealing with other complex health issues, the benefit of which cannot be underestimated. The Down Syndrome Medical Interest Group in the UK are considering the adoption of such a strategy.

Distribution of eosinophils in the gastrointestinal tract in children without an organic disease

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Introduction/Background:
Clinical symptoms of children with organic, functional, and eosinophilic disease overlap. It is therefore imperative to establish guidance on reference values which numbers of mucosal eosinophils (eos) in the gastrointestinal (GI) tract of children without an organic disease are considered normal. In contrast to eosinophilic oesophagitis, other eosinophilic gastrointestinal diseases (EGIDs) are currently not well defined and evidence-based treatment requires definition of which eosinophil numbers are considered pathological.

Aim:
To assess the peak number of eosinophils in each segment of the GI tract in ''healthy'' children who have not been diagnosed with an organic disease within at least one year post endoscopy and had either spontaneous resolution of symptoms or were diagnosed with functional GI disorders (FGIDs) as per Rome criteria.

Methods:
Retrospective study of a tertiary UK paediatric centre, as part of European collaborative project. Patients with macroscopically normal endoscopy and no underlying diagnosis of inflammatory bowel disease, coeliac disease, parasitic infection, or other defined disorders were included. All biopsies were reviewed by a single pathologist and critically reviewed by a second pathologist. The formula: eos/mm^2= (eos/HPF) x(1/area of microscope HPF in mm^2) was used to standardise the results.

Results:
We identified 65 patients (males: n=36, 55%) with median age 13.3 (range 1.5 – 16.5) years who underwent endoscopy between January 2017 and December 2018. The commonest reasons for endoscopy were abdominal pain (89%), followed by diarrhoea (58%) and faltering growth (20%), upon referral; a history of atopy was reported for n=6 patients (9%). Majority of patients (n=42, 65%) were diagnosed with a FGID at the last follow up, whereas spontaneous resolution of symptoms was reported in 23 patients (35%). No histological features of eosinophil activation were noted in this cohort, and age was not a discriminatory factor.

Peak eosinophilic concentrations (IQR, eos/hpf, Table 1) were: oesophagus 0-0, stomach 0-1, duodenal bulb 8-14, second part of duodenum 3-9, terminal ileum 6-13, caecum 11-23, ascending colon 9-21, transverse colon 5-17, descending colon 5-14, sigmoid 4-12, rectum 1-7; however, numbers were higher in outliers. The peak density of eosinophils, as shown on Figure 1, increased progressively from oesophagus to caecum, and then steadily decreased towards the rectum. Importantly, there were no significant differences in eosinophil density between patients with and without FGIDs.

Summary/Conclusions:
We conducted the first cohort study from the UK illustrating median and peak concentration of eosinophils in each segment of the GI tract in healthy children since Behjati et al described paediatric eosinophilic colitis in 2009. In accordance with our European partners, we recommend a standardised way of reporting eosinophil density (eos/mm^2) for use in histological analysis; this allows for objective comparisons to be made and benchmarking between different centres.

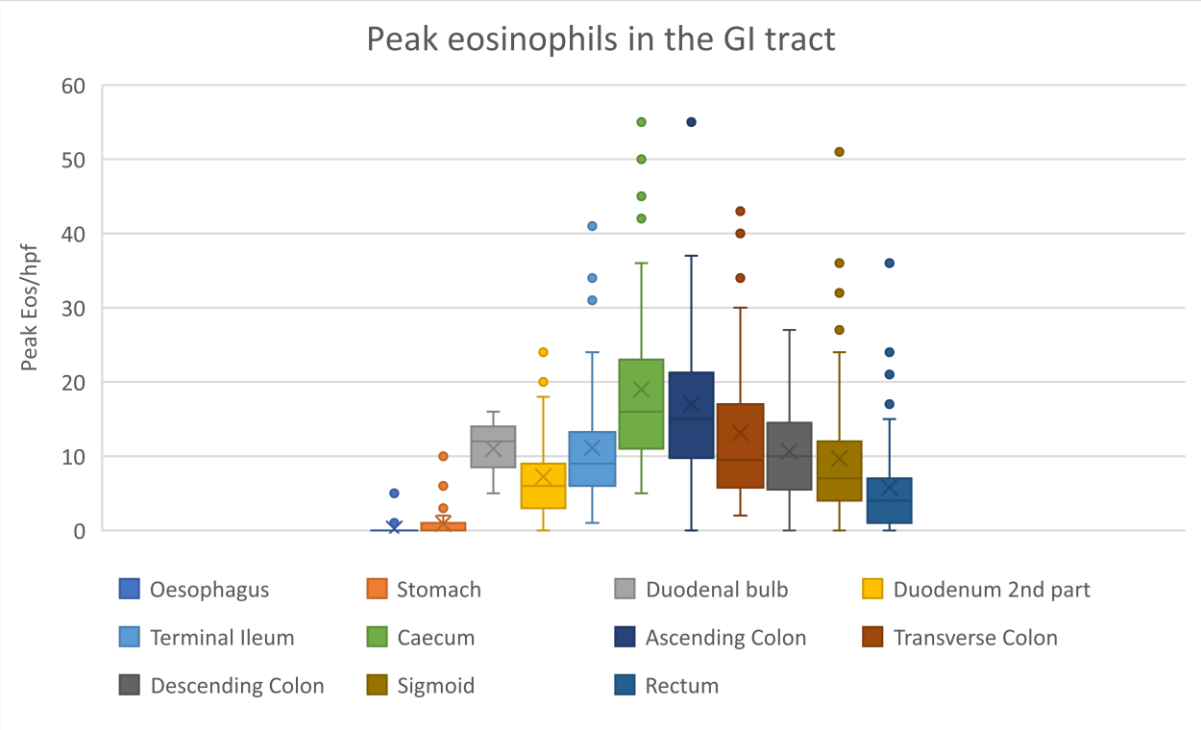
The prevalence of EGID for different sections of the GI tract ranges from 3.8-8.5/100,000 and exerts a substantial burden to patients and families. Evidence-based quantitative assessment

of eosinophils in the intestine provides a pivotal tool to guide clinicians for rational decision making in differential diagnosis and management of mucosal, functional, and organic diseases of the GI tract.

Table 1: Peak number of eosinophils in the GI tract

GI segment	n	Eos/HPF Median (IGQ) Range	Eos/mm² Median (IGQ) Range
Oesophagus	64	0 (0-0) 0-6	0 (0-0) 0-25
Stomach	65	0 (0-1) 0-10	0 (0-4) 0-42
Duodenal bulb	3	12 (8-14) 5-16	50 (33-59) 21-67
Duodenum 2nd part	65	6 (3-9) 0-25	25 (12-38) 0-105
Terminal Ileum	48	9 (6-13) 1-41	40 (25-54) 4-172
Caecum	57	16 (11-23) 5-55	67 (46-97) 21-232
Ascending Colon	60	15 (9-21) 0-56	63 (40-88) 0-236
Transverse Colon	60	9 (5-17) 2-43	40 (21-71) 8-181
Descending Colon	59	10 (5-14) 0-27	42 (21-59) 0-113
Sigmoid	61	7 (4-12) 0-51	29 (16-50) 0-215
Rectum	61	4 (1-7) 0-36	16 (4-29) 0-151

HPF: high per field



Patient Experience of Attend Anywhere virtual consultations in a Tertiary Paediatric Gastroenterology Centre

Lina Bourhan Tashtoush, Eleni Volonaki, Christine Spray, Dharamveer Basude and Kwang Yang Lee.
University Hospital of Bristol

Introduction
Video consultations using the Attend Anywhere web platform were introduced into clinical practice in our tertiary paediatric gastroenterology centre during the COVID-19 pandemic as an alternative to face-to-face consultations. We analysed online feedback received from these consultations to understand our patients' experience of virtual consultations and to identify areas of improvement.

Methods
All patients scheduled for a paediatric gastroenterology video consultation were invited by the hospital Patient Experience Team to complete an online Survey monkey questionnaire at the end of the consultation. We retrospectively analysed feedback received from 01 February 2021 to 30 September 2021.

Results
Over an eight-month period, 83 responses were received. In terms of accessibility, most patients (n=82, 99%) were able to access the virtual consultation without additional help. Most patients (n=81, 98%) saved at least 30 minutes in travel time and of these, 20 patients (24%) saved more than 3 hours of travel. 81 parents (98%) reported financial savings from not travelling to hospital, with 25 patients (30%) saving over £21.

29 patients (35%) found the virtual consultation experience to be significantly better or better than a previous face-to-face consultation. 51 patients (61%) reported it to be about the same, and only three (4%) reported it to be worse or significantly worse.

46 patients (56.1%) found video consultations less stressful compared to face-to-face consultations, while 29 (35%) reported no difference, and 5 (6%) found it more stressful.

77 patients (93%) were happy to have further follow-up appointments virtually, one patient was unhappy for further virtual appointments, and five (6%) did not know.

There was an opportunity for parents to enter free-text comments on their experience. In this, parents commented on how video consultations were convenient, timesaving and less disruptive to family life compared to face-to-face consultations. In addition, they saved the trouble of worrying about traffic, being late, parking delays and navigating in an unfamiliar city. Three parents also commented that having virtual consultations reduced the risk of contracting Covid-19.

Several suggestions were made to improve the experience. This included providing an option for a face-to-face appointment at the point the appointment was made, an indicator to inform patients of expected waiting times in the virtual waiting room and making it clearer who to contact for help if no health professional joined the call.

Compared to telephone consultations, parents/patients found video consultations more interactive especially for the child, as they could see the clinician and participate throughout the consultation instead of just listening in.

Conclusion
Our study highlights the benefits of virtual consultations, including significant time and financial

savings to families. Most families found virtual consultations a satisfactory alternative to face-to-face consultations. Inherent limitations to video consultations- the inability to physically examine patients, and challenges in building rapport with families through video- mean that not all patients will be suitable for video consultation. Overall, video consultations are a useful tool to deliver outpatient services during the pandemic and beyond. The option should be given to families and potential improvements to the service should be investigated.

Tuesday 25th April 2022

Plenary Abstract Session 2

Hepatology

Acute on chronic liver failure, an infrequent paediatric entity: A 20-year retrospective review of a tertiary liver center

Harveen Singh, Chayarani Kelgeri, Charlotte Passingham, Lauren Johansen, Indra van Mourik, Evelyn Ong, Thamara Perera, Darius Mirza, Khalid Sharif, Jane Hartley and Girish Gupte.
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Objectives and Study

Acute on Chronic Liver Failure (ACLF) is defined as an acute deterioration of pre-existing chronic liver disease usually related to a precipitating event and associated with increased mortality at 3 months due to multisystem organ failure. Within paediatrics, ACLF is infrequently described, with most existing cohorts utilising Asian Pacific Association for Study of Liver (APASL) definitions. We aimed to characterise paediatric ACLF at Birmingham Children's Hospital (BCH) utilising European Foundation for Study of Chronic Liver Failure (EASL CLIF) criteria: including prevalence, triggers, outcomes and listing patterns.

Methods

All BCH patients from 2000-2020 with chronic liver disease (CLD) who underwent initial liver transplant or died either on the transplant waiting list or whilst too unwell to be listed were reviewed. Those with IFALD were included, whilst all other significant extrahepatic disease was excluded. Descriptive statistics was presented as median (range) and CLIF C ACLF score calculated to predict 28-day mortality. Fishers exact test was used for categorical data and unpaired t test (mean, standard deviation) for continuous data (Graph Pad).

Results

From 2000-2020 24 (4.2%) children with ACLF were identified out of 576 children meeting review criteria. Age at ACLF onset was 1.75 years (0.25-17) with 9 (38%) males. Death occurred in 18 (75%) children. Aetiology of liver disease, transplant status and CLIF C ACLF scores are outlined in Table 1. All deaths in those with IFALD occurred within the years 2000-2012. ACLF triggers were sepsis organism negative 11(46%), sepsis organism positive 8(33%), GI bleed 4(17%) and liver biopsy bleed 1(4%). All with sepsis organism positive died.

Bilirubin at time of transplant/death in those with ACLF who lived compared to those who died was 529 umol/L(381) vs. 665(210) (p=0.27), Creatinine 138 umol/L(147) vs. 63(44) (p=0.06), Prothrombin time 33(13) vs. 32(14) (p=0.95), use of vasopressor 1(17%) vs. 17(94%) (p=0.008), Grade 3,4 hepatic encephalopathy 1(17%) vs. 9 (50%) (p=0.34) and ventilation 3(50%) vs.17(94%) (p=0.04) respectively.

Of those who were listed pre ACLF, 2 (33%) lived compared with 9 (50%) who died. Median time (days) from ACLF onset to listing was 7 (1-13) in those who lived compared with 15 (1-24) in those who died. Median time (days) from ACLF onset to transplant in those that lived compared with time from ACLF onset to death was 19 (2-32) vs. 17.5 (5-60).

Conclusion

ACLF whilst infrequent in our cohort when utilising EASL criteria has high rates of mortality

with sepsis being a frequent trigger. Those with IFALD are vulnerable, particularly from line sepsis, although death from ACLF in this cohort has become less common in the last decade. Use of vasopressors and ventilation is more frequent in those who die from ACLF despite similar median times to both successful transplant and death from ACLF onset. Larger studies are needed to determine protective factors in children with ACLF who are transplanted and live.

Table 1: Comparison of disease aetiology, transplant and CLIF C ACLF scores at ACLF admission and death/transplant

	Dead (n=18)	**Alive (n=6)**	**P value**
IFALD	6	0	
Metabolic	6	0	
Biliary Atresia	2	1	
PFIC	1	3	
MVID (post SB Tx)	1	0	
Other	2	2	
Transplant	3 (17%)	6 (100%)	
CLIF C ACLF (at admission)	33 (4.5)	33 (6.2)	0.81
CLIF C ACLF (at death/transplant)	37 (5.6)	43 (7.5)	0.12

Characterisation of the pathobiology acute liver failure secondary to NBAS deficiency

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Introduction:
Following its first description in 2015, NBAS deficiency has become an established, monogenic cause of recurrent acute liver failure (ALF). Acute liver failure is characteristically triggered by fever and its pathobiology has been linked to a disruption in retrograde transport between the Golgi and endoplasmic reticulum. Previous in vitro experiments demonstrated that application of stress by heat caused reduced protein expression and function. A second mechanism proposed is a disruption in nonsense-mediated mRNA decay (NMD), a highly conserved post-transcriptional regulatory mechanism of gene expression in eukaryotes. The purpose of this work was to further characterise the pathobiology of NBAS deficiency and evaluate whether NMD is disrupted using the endogenous NMD targets, GADD45A and GADD45B.

Methods:
Skin fibroblasts from patients affected by ALF secondary to NBAS deficiency were obtained. Fibroblasts were cultured for 24 hours before stress was applied by increasing their incubation temperature to 40 °C for 24 hours or switching to a low glucose medium. To investigate for NMD disruption, RNA was extracted from fibroblasts and reverse transcription-quantitative polymerase chain reaction (RT-qPCR) was performed for GADD45A and GADD45B, the expressions of which increase when NMD is disrupted.

Results:
The variants observed in the 4 patients affected by NBAS deficiency is represented in Table 1. As expected, cell viability increased in all cell lines incubated at 37 °C with a glucose concentration of 4.5g/L in the culture medium. When the incubation temperature was increased to 40 °C, patient cells demonstrated a lower cell viability in comparison to controls at 500 cells/well. Under glucose deprivation, cell growth was hampered for NBAS3 but was maintained in all other cells at 48 and 72 hours.

For the evaluation of NMD, the expression of GADD45A and GADD45B were higher in control cells in comparison to affected patients.

Conclusion:
This work expands on the currently limited understanding of the pathobiology of NBAS deficiency. The application of stress on cultured fibroblasts from affected patients demonstrated some impairment in viability in comparison to healthy controls but this finding was not entirely consistent. The expression of endogenous NMD targets, GADD45A and GADD45B, were lower in patient cells suggesting that NMD was maintained.

Patient	**NBAS variants (NM_015909.4, NP_056993.2)**
NBAS1	c.4731_4733dup, p.Tyr1578dup,
NBAS2	c.exons 17-19 dup, p.?/c.exons 17-19 dup, p.?
NBAS3	c.1702G>A, p.Val568Ile/c.191G>A, p.Val568Ile
NBAS4	c.2191A>C, p.Thr731Pro/c.2191A>C, p.Thr731Pro

Treating children with HCV close to home through a virtual national multidisciplinary network

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Background and Aims: Hepatitis C virus (HCV) infection is a major global health problem in adults & children. The recent efficacy of Direct Acting Anti-viral therapy (DAA) has cure rates of 99% in adults and adolescents. These drugs were licensed for children 3–12 yrs during the recent coronavirus pandemic. To ensure equitable access, safe & convenient supply during lockdown, we established a virtual national treatment pathway for children with HCV in England & evaluated its feasibility, efficacy & treatment outcomes.

Method: A paediatric Multidisciplinary Team Operational Delivery Network (pMDT ODN), supported by NHS England (NHSE), was established with relevant paediatric specialists to provide a single point of contact for referrals & information. Referral & treatment protocols were agreed for HCV therapy approved by MHRA & EMA. On referral the pMDT ODN agreed the most appropriate DAA therapy based on clinical presentation & patient preferences, including ability to swallow tablets. Treatment was prescribed in association with the local paediatrician & pharmacist, without the need for children & families to travel to national centres. All children were eligible for NHS funded therapy; referral centres were approved by the pMDT ODN to dispense medication; funding was reimbursed via a national NHSE agreement. Demographic & clinical data, treatment outcomes & SVR 12 were collected. Feedback on feasibility & satisfaction on the pathway was sought from referrers.

Results: In the first 6 months, 34 children were referred; 30- England; 4 - Wales; median (range) age 10 (3.9 – 14.5) yrs; 15M; 19F: Most were genotype type 1 (17) & 3 (12); 2 (1); 4(4). Co-morbidities included: obesity (2); cardiac anomaly (1); Cystic Fibrosis (1); Juvenile Arthritis (1). No child had cirrhosis. DAA therapy prescribed: Harvoni (21); Epclusa (11); Maviret (2) .27/34 could swallow tablets; 3/7 received training to swallow tablets; 4/7 are awaiting release of granules.11/27 have completed treatment and cleared virus; of these 7/11 to date achieved SVR 12. 30 children requiring DAA granule formulation are awaiting referral and treatment.

Referrers found the virtual process easy to access, valuing opportunity to discuss their patient's therapy with the MDT & many found it educational. There were difficulties in providing the medication through the local pharmacy. However there are manufacturing delays in providing granule formulations because suppliers focused on treatments for COVID, leading to delays in referring and treating children unable to swallow tablets.

Conclusion: The National HCV pMDT ODN delivers high quality treatment & equity of access for children & young people, 3– 18 yrs with HCV in England, ensuring they receive care close to home with 100% cure rates.

Preservation of fat mass at the expense of lean mass in children with end stage chronic liver disease.

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Introduction/ Background: Sarcopenia predicts morbidity and mortality in patients with end-stage chronic liver disease (ESCLD).

Aim: To describe changes in body composition in children with ESCLD before and after liver transplantation (LT) and correlate with clinical parameters.

Subjects/Methods: Retrospective analysis of whole body DXA scans performed before and after LT of children with ESCLD (5 years old and above) who were assessed for LT during 2014-2019 at the Children's Liver Unit in Leeds. Fat mass and lean mass was recorded for arm, leg, trunk and whole body and was expressed as fat mass index (FMI) and lean mass index (LMI) and converted to z-scores using UK WHO reference data in ImsGrowth program©. Sarcopenia was defined as leg LMI z-score < -1.96.

Results: We studied 25 DXA scans of children before LT, 26 children at 1 year after LT (19 children were the same at baseline), 15 at 2 years after LT (10 were the same at baseline), 10 at 3 years post LT (7 of which at baseline) and 7 at 4 years post LT (5 of which at baseline). Figure-1 shows Leg LMI before and after LT.

Overall leg LMI z-score had a significant correlation (Spearman's rho) with Weight (0.8)**, Height (0.48)* and BMI z-score (0.77)**, arm LMI (0.75)*, trunk LMI (0.53)** and total LMI z-score (0.86)**PLTs (-0.57**), Neu (-0.50)*, WCC (-0.44)* and days to discharge (-0.46)*. Days to discharge also correlated with BMI z-score (-0.51)** and Hb (0.43)*.

At baseline: Age median 11.7 years (SD 2.98), weight z-score median -0.35 (SD 1.41), height z-score median -0.61 (SD 1.62) and BMI z-score median -0.3 (SD 0.87). 13/25 children were sarcopenic. They had significantly lower weight, BMI, arm LMI, leg FMI, trunk LMI and total LMI z-scores in comparison to the other 12 children and stayed in hospital after liver transplant for longer.

Eight children were stunted. They had a significantly lower weight z-score and higher white cell count (WCC) and Ne/Ly ratio in comparison to the other 17 children. All children had FM indices within the normal range.

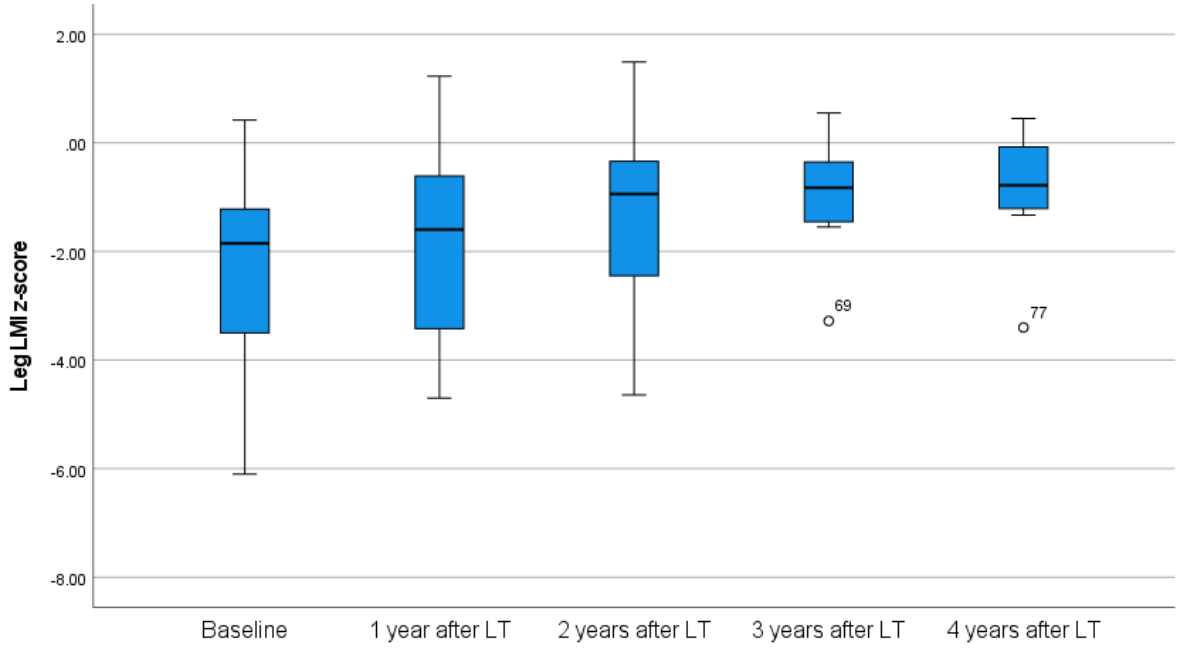
One year after LT, 12/26 children remained sarcopenic. Seven were stunted and all had normal FM indices. Two years after LT, 5/15 were sarcopenic, all had normal FM indices and 5 were stunted. Three years after LT, 1 of the 10 children was sarcopenic and 2 were stunted. By 4 years after LT, 1/7 was sarcopenic and the same one was stunted.

**p<0.01 *p<0.05

Summary/Conclusion: 52% of patients were sarcopenic at baseline. Indices of lean mass improved after LT and were mostly within the normal range by 4 years after LT. 32% of children were stunted and surrogate markers of inflammation (Ne/Ly) correlated with stunting. Sarcopenia correlated negatively with indirect markers of hypersplenism.

Body composition in children with ESCLD shows preserved fat mass at the cost of lean mass. Systemic inflammation and portal hypertension are associated with these perturbations.

Figure 1: Leg LMI z-score at baseline and after LT



Outcome of Children on the UK National Prioritised Paediatric Registration Tier

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Introduction: In April 2020 weekly teleconferences were established involving adult and paediatric representation from all 7 UK liver transplant (LT) centres and NHS England to discuss and maintain a national LT service during the COVID19 pandemic. Objective criteria to prioritise adult patients of high clinical urgency for prioritised access to LT were established. In lieu of such criteria for paediatric patients all three paediatric centres agreed to prioritise individual paediatric patients with chronic liver disease who were clinically deteriorating by consensus. A process to formally nationally prioritise clinically deteriorating paediatric patients was successfully introduced in October 2020. We report on the utilisation of the tier and outcome of these patients at a national level.

Methods: Patients from all 3 paediatric LT centres registered on the newly established national prioritised paediatric registration tier from October 2020-October 2021 were included. Demographic, clinical and laboratory data were collected and analysed.

Results: Since the introduction of the prioritization tier for children there were eight UK elective applications and all approved registrations. Mean age of patients registered was 5 years (range, 0-15). All patients were listed for LT prior to prioritisation except patient 5 who was listed for liver-small bowel transplant before being prioritised for isolated LT. Indications for prioritization were hepatocellular carcinoma (1), acute decompensation due to portal hypertension (2), encephalopathy (3), sepsis (1), acute kidney injury (1). At time of prioritisation median values and range of alanine aminotransferase, albumin, total bilirubin, INR and platelets were 95 IU/L (23-453), 25 g/L (16-39), 196 micromol/L (10-553), 1.6 (0.97-2.27) and 75 x109 (41-188), respectively. Median waiting time to transplant after prioritisation was 10 days (range, 3-37). All patients received a graft from a DBD donor and are all well at home. Median length of post-transplant ICU stay was 9 days (3-62) and total length of hospital stay was 56 days (27-85). Data on demographics and LT are listed on Table 1. Conclusion: The national paediatric prioritisation tier, introduced during the COVID19 pandemic, has been a pivotal initiative for the UK paediatric LT program, showcasing national collaboration. All patients underwent a LT successfully within a short time from prioritisation with 100% patient and graft survival. The intention is to maintain this prioritised paediatric tier following the pandemic.

Table 1: Demographic and transplant data for all 8 prioritised patients. PFIC3; Progressive Familial Intrahepatic Cholestasis type 3, LT; Liver transplantation, NSC; Neonatal Sclerosing Cholangitis, CDG; Congenital Disorder of Glycosylation, AILD; Autoimmune Liver Disease, IFALD; Intestinal Failure Associated Liver Disease.

Patient/Sex	**Centre**	**Age at registration (yrs)**	**Primary liver disease**	**Registered prior to Prioritisation**	**LT**	**Waiting time on prioritised tier/ Time on list prior to prioritisation**
1/	1	0	CDG	Yes	Yes/LLS	5/27
2/M	2	1	Cryptogenic Cirrhosis	Yes	Yes/LLS	16/48
3/F	1	15	AILD	Yes	Yes/whole liver	3/4
4/M	2	0	Biliary Atresia	Yes	Yes/LLS	14/71
5/F	2	4	IFALD	No	Yes/LLS	15/820
6/F	2	0	NSC	Yes	Yes/LLS	37/405
7/M	2	10	Biliary Atresia	Yes	Yes/reduced R lobe	4/7
8 /M	3	9	PFIC3	Yes	Yes/LLS	6/51

Hepatic Parameters, Growth, and Sleep With Responders and Nonresponders to Odevixibat Treatment: Pooled Data From the PEDFIC 1 and PEDFIC 2 Studies in Children With Progressive Familial Intrahepatic Cholestasis

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Introduction/background: Progressive familial intrahepatic cholestasis (PFIC) is a group of inherited paediatric cholestatic liver diseases. In the phase 3 PEDFIC 1 and PEDFIC 2 studies, odevixibat, an ileal bile acid transporter inhibitor, reduced serum bile acids (sBAs) and improved pruritus in patients with PFIC.

Aim: Using pooled data from PEDFIC 1 and PEDFIC 2, we analysed hepatic biochemical parameters, growth, and sleep changes in patients who responded to odevixibat (Rs) versus nonresponders (NRs) after up to 72 weeks of treatment.

Subjects and methods: PEDFIC 1 was a 24-week, randomised, placebo-controlled study in children with PFIC1 or PFIC2. PEDFIC 2 is an ongoing 72 week, open-label extension study in patients with any type of PFIC. This pooled analysis spans from patients' first dose of odevixibat to a cut-off date of 4 December 2020. Treatment Rs met either sBA response criteria (defined per the PEDFIC 1 study protocol) or sBA and/or pruritus response criteria (Table). Assessments included change from baseline in transaminases, total bilirubin, growth, and sleep parameters.

Results: In total, 84 patients (mean age, 5.0 years) received odevixibat (median [range] exposure, 53 [3−128] weeks). Overall, 30/81 (37%) patients were sBA Rs and 49/84 (58%) were sBA and/or pruritus Rs during weeks 0−72. From baseline to week 72, Rs had mean improvements in transaminases and total bilirubin levels (Table). Patients who were NRs had more pronounced growth deficits at baseline; however, with treatment, mean height and weight Z scores increased in both Rs and NRs (Table). Rs and NRs had similar sleep characteristics at baseline. After 72 weeks of treatment, sBA Rs had large decreases in caregiver-reported percentage of days patients had scratching associated with bleeding, needed soothing, and needed help falling asleep (–47%, –76%, –75%, respectively); increases or smaller changes were observed in sBA NRs (3%, –24%, −35%, respectively). Comparable results were observed in sBA and/or pruritus Rs. Drug-related treatment-emergent adverse events (TEAEs) were reported in 47% and 39% of sBA Rs and NRs, respectively, and in 49% and 31% of sBA and/or pruritus Rs and NRs; no drug-related serious TEAEs were reported.

Summary and conclusion: Odevixibat treatment for up to 72 weeks in patients with PFIC was

associated with improvement in hepatic health, quality of sleep, and growth, with greater improvement observed in Rs compared with NRs. Odevixibat was generally well tolerated in Rs and NRs.

Table: Changes in Secondary Endpoints Over Time in Treatment Responders and Nonresponders

	sBA Response[a]				sBA and/or Pruritus Response[b]			
	Yes		No		Yes		No	
	n[c]	Mean (SE)	n[c]	Mean (SE)	n[c]	Mean (SE)	n[c]	Mean (SE)
ALT, U/L								
Baseline	30	113 (27)	51	81 (10)	49	105 (18)	35	75 (10)
CFB to week 72	12	–141 (63)	9	37 (29)	16	–99 (51)	5	44 (49)
AST, U/L								
Baseline	30	91 (10)	51	102 (10)	49	100 (9)	35	94 (11)
CFB to week 72	12	–59 (14)	9	35 (30)	16	–35 (18)	5	33 (46)
Total bilirubin, µmol/L								
Baseline	30	28 (6)	51	65 (10)	49	38 (5)	35	68 (14)
CFB to week 72	12	–13 (5)	9	5 (10)	16	–13 (5)	5	20 (10)
Height Z score								
Baseline	29	–0.9 (0.2)	48	–2.3 (0.2)	48	–1.5 (0.2)	32	–2.3 (0.3)
CFB to week 72	12	1.0 (0.2)	10	0.6 (0.2)	16	0.9 (0.2)	6	0.6 (0.3)
Weight Z score								
Baseline	30	–0.3 (0.2)	48	–1.5 (0.2)	49	–0.7 (0.2)	32	–1.5 (0.3)
CFB to week 72	12	0.8 (0.2)	10	0.2 (0.2)	16	0.6 (0.2)	6	0.3 (0.3)

[a]Patients with ≥70% reduction in sBAs or sBAs ≤70 µmol/L (baseline level had to be >70 µmol/L for this analysis); [b]Patients with sBA response and/or pruritus score reduction of ≥1 point from baseline; [c]Patients with available data at time point for secondary endpoint parameter listed in each row. ALT, alanine aminotransferase; AST, aspartate aminotransferase; CFB, change from baseline; sBA, serum bile acid; SE, standard error.

Conflict of Interest Declaration
P. McKiernan: Sobi AB, Albireo – Consultant
E. Sturm: Albireo, Mirum, and Astellas – Consultant and/or received travel support
B.M. Kamath: Albireo, Mirum, and Audentes – Consultant; Albireo and Mirum – Unrestricted educational grant
R.J. Thompson: Albireo, Alnylam, Evox Therapeutics, Generation Bio, Mirum Pharma, Rectify Therapeutics, Retrophin, Qing Therapeutics, and Sana Biotechnology – Consultant
E. Gonzalès: Laboratoires CTRS, Mirum, and Albireo – Consultant
A. Lachaux: GMP-Orphan, CSL Behring – Consultant
U. Baumann: Albireo, Mirum, Alnylam, Vivet, and Nestlé – Consultant
T. Grammatikopoulos: Albireo – Consultant
S.J. Karpen: Albireo, Intercept, LogicBio, and Mirum– Consultant
E. Shteyer, P. Czubkowski, R. Artan, B. Dalgic, H. Özen, and G. Gupte: Nothing to disclose
Q. Ni, L. Kjems, P. Horn: Albireo – Current or former employment

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Wednesday 26th April 2022

Plenary Abstract Session 3
Nutrition

Working definition of gastrointestinal dystonia of severe neuro-disability; Outcome of the BSPGHAN/BAPM/BAPS/APPM/BPNA appropriateness panel.

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Background and Aims: Children and young people with severe neurosdisabling conditions (CYPWSND) experience an array of serious gastrointestinal symptoms beyond gastro-oesophageal reflux, constipation or dependence on artificial nutrition. When enteral feeds leads to disabling dystonia the term 'gastrointestinal dystonia of severe neurodisability' (GID) has been applied by clinicians. However a clear definition with criteria for entry point is lacking in the literature. We describe the methods for formal establishment of an agreed definition of GID.

Methods: After commissioning by BSPGHAN, systematic review (1) and consultation with public bodies it was agreed, due to paucity of evidence that an appropriateness panel should be the forum for formulation of output on GID. A writers group structured the questions for the survey definition, based on the limited written evidence and added professional experience. A panel of 27 experts in their field were assembled from 5 stakeholder groups including: Gastroenterology, Neurology/Neurodisability, Surgery, Palliative Care and Allied Health Professionals. Geographic representation was from 13 UK specialist centres (including all 4 nations) and 1 centre from Republic of Ireland. The panel rated the appropriateness of definition, investigations and management of GID. A scale of 1-9 enabled scoring of 1-3 to indicate inappropriate, 4-6 uncertain, 7-9 appropriate as criteria for recommendation. Panel agreement index was calculated using a continuous likelihood ratio, with <1 indicated 'general agreement' and >1 'no agreement'. Results were discussed at a moderated.

Results: All of the panel completed all questions on 'common' (Table 1) and 'uncommon' features of GID. The panel had strong concurrence that GID definition required patients have GMFCS 4-5 cerebral palsy or equivalent and that a temporal relationship between symptoms and enteral feeding had to be present (although this relationship may lessen or cease during progressive disease). Pain, distress, retching, autonomic activation and hypertonicity were seen as common features. Temporal relationship with bowel habit, involuntary movements were considered less common. The diagnosis should be a positive clinical diagnosis (not of exclusion) made by a specialist multi-disciplinary team with experience of feeding disorders in severe neuro-disability. Features suggesting patients feed intolerance has reached the threshold for GID would include malnutrition primarily due to feed cessation and GI symptoms being the greatest burden on QOL for patient/family on appropriate survey.

Conclusions: We present a coherent first definition for GID by consensus of a panel of identified experts drawn from 5 invested stakeholder groups. Clear entry point for diagnosing GID will allow for important epidemiological work to report investigations, interventions and outcomes for this complex group of patients. Identifying significant morbidity care burden and mortality in this patient group will help advocate for appropriate health resources, support to carers and families. The ongoing development of a management framework through completion of the RAND (2) process in 2022 should assist navigation of the complex medical and ethical challenges of management of distressing and debilitating symptoms for patients with this condition.

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Acknowledgement: BSPGHAN BiG funding 2020

Table 1: Results of panel appropriateness survey on 'Common features' for definition of GID

Statement	**Median score**	**Disagreement index**	**Appropriateness category**
Severity of Neurological deficit (GMFCS 4-5 or non-ambulant)	7	0.16	**Appropriate**
Clear temporal relationship with feeding at some point in disease course	8	0.28	**Appropriate**
Clear temporal relationship with bowel habit	6	0.52	**Uncertain**
Hypertonicity	6	0.52	**Uncertain**
Involuntary movements	6	0.52	**Uncertain**
Distress	8	0.13	**Appropriate**
Retching	6.5	0.52	**Appropriate**
Hyper-salivation	5	0.32	**Uncertain**
Other manifestations of nausea	5	0.78	**Uncertain**
Autonomic activation (flushing, sweating, pallor, tachycardia, bradycardia)	7	0.37	**Appropriate**
Abdominal distension	5	0.96	**Uncertain**
Absence of evidence of relationship with Gastro-oesophageal reflux	6	0.97	**Uncertain**
Symptoms resulting in significant malnutrition due to feed cessation	6.5	0.97	**Appropriate**
Symptoms being the most significant factor in reducing current QOL	7	0.16	**Appropriate**
Assessment by a paediatrician with specialist training in movement disorders	7	0.62	**Appropriate**
Assessment by a paediatrician with specialist training in movement disorders Assessment by a paediatric gastroenterologist	8	0.16	**Appropriate**
Assessment by a specialist paediatric nutrition support team	7	0.29	**Appropriate**

Diagnosis and treatment of Helicobacter pylori gastritis in East London. Aiming for further integrated care with general practice to improve treatment outcomes

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Introduction/Background: Joint ESPGHAN-NASPGHAN guidelines1 for the management of Helicobacter pylori (h. pylori) in children and adolescents were last updated in 2016, in view of the rising prevalence of antibiotic-resistant strains. More recent NICE guidelines2 published in 2021 only focus on adult patients.

Aim: We performed an internal audit at our tertiary level unit in East London, an area with ethnic diversity and a high prevalence of H. pylori infection, to benchmark our practice against national and international recommendations.

Subjects and Methods: Between January 2015 and December 2017, 40 children had a confirmed diagnosis of H.pylori gastritis based on histological examination of gastric biopsies. Retrospective clinical data were collected independently by 2 reviewers using information from the electronic patient records. Baseline characteristics (age at time of diagnosis, gender, co-morbidities) and relevant details (H. pylori faecal antigen result, symptoms at diagnosis, endoscopic and histological findings, treatments and follow-up) were recorded in an anonymised Excel spreadsheet and evaluated.

Results: Within the study period, H. pylori antigen test was undertaken on faecal samples from 702 children in our catchment area, of which 638 (91%) were positive. Forty children (24 males, mean age 11.7 years, median 13 +/- SD 3.94, range 3-16) were referred to our tertiary level centre for a diagnostic confirmation based on histological examination of gastric biopsies. The most common symptom at referral was abdominal pain in 30/40 (75%) patients, with a specific epigastric location in 19 (47.5%). Eighteen (45%) patients presented with nausea, reflux or vomiting, 4 with chest pain and 5 (12.5%) with anaemia (4 of these required pre-endoscopy blood transfusion). Three patients had gastric ulcers and 5 had duodenal ulcers. Rapid urease test (CLO) was positive in 77% of the patients tested (24/31). Gastritis on histology was severe in 21%, moderate in 37%, and mild in 42%. The majority of patients (69%) responded to 1st (amoxicillin/clarithromycin/PPI) or 2nd line (clarithromycin/metronidazole/PPI) treatments. Twenty-six (65%) were re-tested with H. pylori faecal antigen to confirm eradication and this was successfully achieved in 69% of this group. From the records available to us only 30% of the time were family members tested in the community and successfully treated if positive.

Conclusions: Significant testing appears to be happening in the community without patients being referred to tertiary services for endoscopy. Patients who do have endoscopy are more likely to have had long standing H. pylori which in our cohort generally responded well to therapy. However, a significant proportion of our cohort was not assessed for eradication and it was difficult to tell if testing of family members had occurred and actioned upon. We suggest that this should be a future emphasis for future guidelines. It also highlights the ongoing requirement for more integrated and joined up care for paediatric services especially between general practice and specialist paediatric care.

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2 http://pathways.nice.org.uk/pathways/dyspepsia-and-gastro-oesophageal-reflux-disease

Prognostic factors associated with the length of parental nutrition and the development of nutritional deficiencies after reaching enteral autonomy for children with short bowel syndrome

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Background:

Short bowel syndrome (SBS) is the leading cause of paediatric intestinal failure (IF). Long-term parenteral nutrition (PN) is required for maintaining biochemical stability and growth during the time bridge for achieving enteral autonomy (EA). Factors as the primary cause of intestinal resection and the length and part of the remaining bowel segment influence the time required for reversing intestinal failure but can also indicate those children at risk of nutritional deficiencies after reaching EA.

Methods:
Review of the medical notes of 40 patients with EA (24M, 16F, mean age 8.7 (2-16.2) yrs) and 14 patients dependent on PN (7M, 7F, mean age 9.5 (4.4-16) yrs), who had intestinal resection and required PN for more than 60 days.

The children with antenatal intestinal diagnosis were compared with those with postnatal diagnosis. They have been further divided according to the remaining segment of the small bowel (SB) to two groups: Group A: 10-25%% of remaining SB and full of the colon or ≥25% of SB with full or part of colon, Group B<10% with full or part or no colon, 10-25% with part or no colon (table I).

The groups were compared for the time of PN requirement, the need for supplementation after reaching EA and the development of small intestine bacterial overgrowth (SIBO) using appropriate statistical methods.

Results:
♣ Necrotizing enterocolitis was the leading cause for intestinal resection (38.9%) followed by gastroschisis (22.2%), malrotation with volvulus (20.4%), segmental volvulus (9.3%) and long segment Hirschsprung disease (1.9%). There was no difference in the prevalence of antenatal and postnatal causes between the groups of EA and PN.
♣ Children with shorter intestinal length (group B) were more likely to remain on PN compared to those with longer segments (group A) (RR 2.38, 95%CI 1.34-4.2, p=0.008) (figure I).

♣ Patients with an antenatal diagnosis remained longer on PN compared to those with a postnatal diagnosis (655.9±268d vs250.9±115d respectively, t2.68, p=0.005), which was confirmed after stratified analysis of the children with longer intestine (group A in the EA vs group A in the PN group) (558.9±307d vs 185.2±63.6d, t=2.57, p=0.008).

♣ SIBO was more common in the group with antenatal vs postnatal diagnosis (RR1.77 95%CI 0.85-3.72, p=0.09), despite that the two groups didn't differ in the presence of ICV (OR 0.77, 95%CI 0.21-2.79, p=0.47).

♣ B12 supplementation was required significantly more frequently in the group with antenatal diagnosis vs with postnatal (RR 9.71, 95%CI 1.34-67.4, p<0.001)

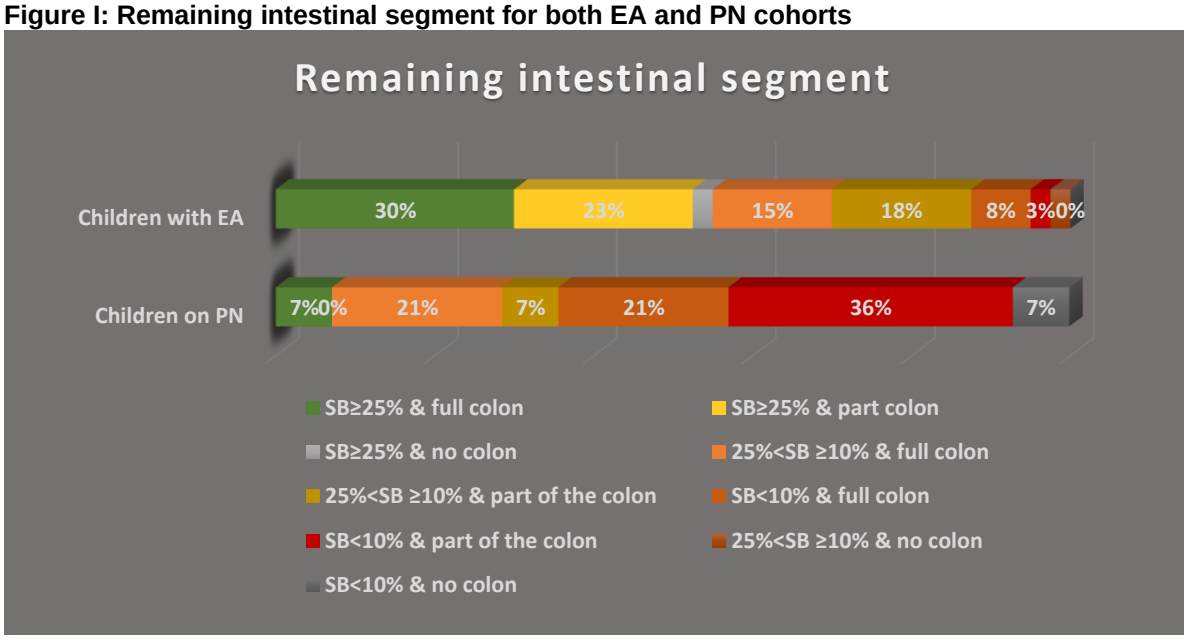
♣ Vitamin D supplementation was required more frequently in the group with antenatal diagnosis vs with postnatal (RR1.64, 95%0.95-2.85, p=0.05). Supplementation of vitamin A and E and iron didn't differ among the groups.

Conclusion:
Intestinal length was the predictor for enteral autonomy in our cohort. The children with an antenatal diagnosis required PN for longer and were at risk for developing vitamin D and B12 deficiency and SIBO, despite bowel lengthening procedures. This patient group, therefore, needs closer monitoring and supplementation by the IF multidisciplinary teams.

Table I: SBS patients with enteral autonomy

	Total	Antenatal causes			Postnatal causes		
	(n=40)	Total N=22	Group A (n=14)	Group B (n=8)	Total N=18	Group A (n=14)	Group B (n=4)
Bowel Lengthening	8/40 (20%)	6/21 (28.6%)	3/14 (21.4%)	3/8 (37.5%)	1/18 (51.7.5%)	1/14 (7.1%)	0
ICV present	17/38 (44.7%)	9/22 (40.9%)	6/13 (46.2%)	3/8 (37.5%)	8/17 (47%)	7/13 (53.8%)	1/4 (25%)
Ostomy	2/40 (5%)	1/22 (4.5%)	1/14 (7.1%)	0	1/18 (5.5%)	0	1/4 (25%)
Mean time on PN (d)	473.7 ±163.4	655.9 ±268	558.9 ±307.3	825.6 ±600	250.9 ±115.2	185.2 ±63.6	480.7 ±637.6
SIBO	19/40 (47.5%)	13/22 (59.1%)	10/14 (71.4%)	3/8 (37.5%)	6/18 (33.3%)	5/14 (35.7%)	1/4 (25%)
Nocturnal Stooling	3/42 (7%)	3/20 (15%)	3/12 (25%)	0	0	0	0
Micro-nut/ents supp/tion							
Vit B12	13/38 (34.2%)	12/21 (57.1%)	8/13 (61.5%)	4/8 (50%)	1/17 (5.9%)	1/14 (7.1%)	0
Iron	19/39 (48.7%)	11/21 (52.4%)	6/13 (46.2%)	5/8 (62.5%)	8/18 (44.4%)	6/14 (42.9%)	2/4 (50%)
Vit A	7/33 (21.2%)	4/16 (25%)	0	4/8 (50%)	3/17 (17.6%)	2/13 (15.4%)	1/4 (25%)
Vit D	25/39 (64.1%)	17/22 (77.3%)	12/14 (85.7%)	5/8 (62.5%)	8/17 (47.1%)	7/14 (50%)	1/3 (33.3%)
Vit E	10/35 (28.6%)	7/18 (28.9%)	4/10 (40%)	3/8 (37.5%)	3/17 (17.6%)	2/13 (15.4%)	1/4 (25%)

Figure I: Remaining intestinal segment for both EA and PN cohorts



Enteral autonomy and central line sepsis in Home Parenteral Nutrition (HPN) patients discharged since 2015; single centre experience

Emma Bache[1], Lizzie Hutchison[2], Ali Dinning[2], Amy Phipps[2], Sam Broad[3], Matt Thorpe[4], Richard Tozer[5], Hazel Greene[6], Christopher Knight[7] and Tony Wiskin[2].
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BACKGROUND
For a patient and their family, preparing to be discharged home with parenteral nutrition (PN) can be a daunting experience. Considerable time is spent educating parents over care of the central venous catheter in order to prevent infection as this is an important factor in HPN outcomes. Unfortunately, there are very few modern cohorts detailing outcome of HPN to enable adequate counselling and support for families.
The aim of the study was to collate and analyse outcomes of paediatric patients discharged on home PN, most notably rates of line sepsis and enteral autonomy (no longer requiring PN).

METHODS
Patients discharged on Home PN by our centre from 1/1/2015 to 31/12/2020 were included. Data were censored at 30/09/2021. Children on home PN prior to 2015 were excluded. Medical records and laboratory results were reviewed in Bristol and in the local hospital of each patient. Data collected included indication for home PN, numbers of days of home PN per year, episodes of line sepsis per year (blood culture positive infection or line associated infection that necessitated line removal) and line sepsis rate defined as the number of episodes of line sepsis per 1000 days of home PN.

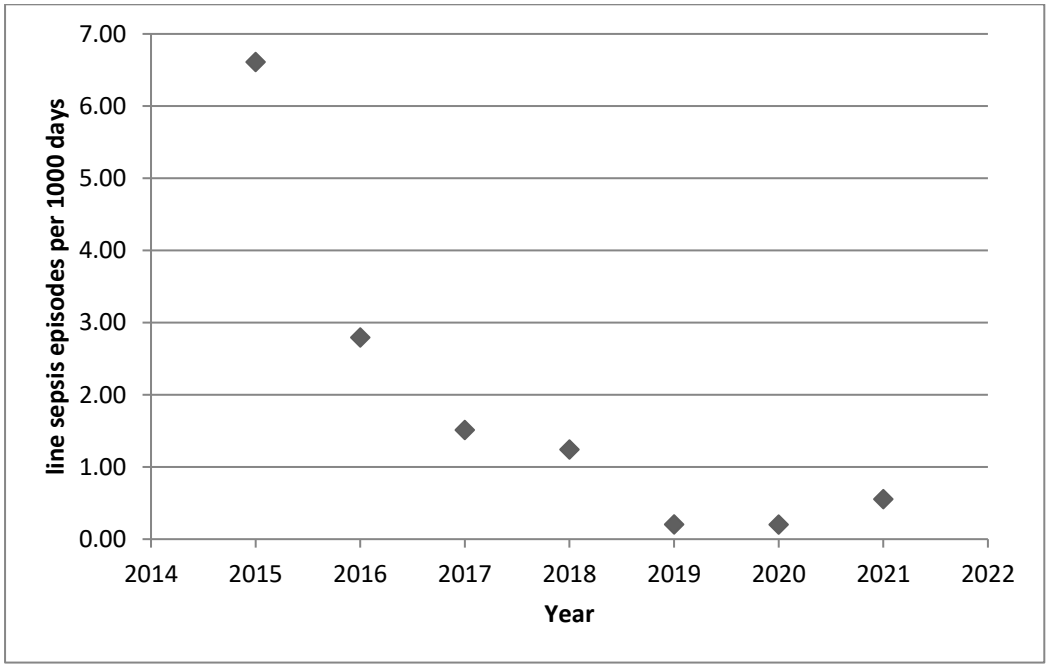
RESULTS
Overall 30 patients met the inclusion criteria and were included in the study. Indications for home PN were short bowel syndrome (19), dysmotility (4), functional gastrointestinal disorders (1), fabricated/induced illness (1), enteropathy (2) and other (3).
Of the 19 children with Short Bowel Syndrome, 11 achieved enteral autonomy receiving a median of 448 days HPN (range 23 – 1379 days); 3 of these patients were over 3 years of age before they achieved enteral autonomy. Three other children achieved enteral autonomy including 1 child with FII and 2 children defined as “other”: 1 of these had frozen abdomen post-surgery, 1 was a child born with gastroschisis.

Two children transferred to other services still requiring HPN; 1 teenager transitioned to adult services having received 1750 days of PN; 1 child with short bowel syndrome was transferred to another unit following family relocation. 14 of the 30 children continue to receive HPN in our service, these include the 2 children with enteropathy, 4 children with dysmotility, and 7 children with short bowel syndrome. For these 7 children with short bowel syndrome; median PN duration was 1666 days, (range 121 – 2157 days); four children are school age and all four attend mainstream school.

From 2015 a nutrition support team was established with dedicated consultant, nurse specialist and dietetic time. The team introduced a wide range of interventions to reduce line sepsis including education of hospital staff and carers, line care devices and sepsis plans. Overall there were 1.11 line sepsis episodes per 1000 line days. Line sepsis rate per year is shown in the figure.

CONCLUSIONS
Enteral autonomy for children with short bowel syndrome in our centre is comparable to data

from larger cohorts. The intervention of a dedicated nutrition support team has had a dramatic impact on reducing rates of central line infection.



Clinical utility and complications of diagnostic flexible gastro-intestinal endoscopy in patients post Allogeneic Haematopoetic Stem Cell Transplant: 11 year experience from a single centre.

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Background
Diagnostic flexible gastro-intestinal endoscopy can be used post Allogeneic Haematopoetic Stem Cell Transplant (Allo-HSTC) to guide clinical management. It is increasingly used to try and differentiate Gastro-intestinal Graft versus Host Disease (GI-GvHD), which requires escalation of immunosuppressive treatment (IST), from viral infection in particular which requires reduction of IST.

Aims
This service evaluation, in our centre, aimed to establish: i) complication rate of diagnostic gastro-intestinal flexible endoscopy in children post Allo-HSTC ii) clinical utility of endoscopy post Allo-HSTC.

Methods
Patients were identified from endoscopy records and Paediatric HSTC database between January 2010 and December 2020. Medical records and results were reviewed and data collected directly into an excel spreadsheet by the authors working in pairs. Authors made a decision on whether the endoscopy had been of clinical benefit if either; resulted in a change of management; or confirmed clinical decision, for example confirming GI-GvHD more likely than infection.

Results
A total of 339 allo-HSCT occurred in (320 children). 51/320 children had gastro-intestinal (GI) flexible endoscopy at a median of 74 (range 20-726) days post-transplant. In total there were 66 theatre bookings for endoscopy. 109 procedures were performed; 64 oesophagogastroduodenoscopy (OGD); 45 colonoscopy (8/45 complete to caecum). On 43 events, OGD and colon' were performed concurrently. There were significant complications on 3/66 events: 1 patient developed septic shock requiring intensive care; 1 patient developed a duodenal haematoma; 1 patient had gastro-intestinal bleeding that required therapeutic endoscopy. Within 4 weeks of endoscopy, two patients died from multi-organ failure after sequelae of disease and its treatment.
Theatre bookings were primarily to investigate for GI-GvHD; 37/61 had skin GvHD at the time of endoscopy. At 43 of the endoscopy episodes children were not receiving systemic steroids; 25 did not have GI-GvHD on histology, 18 did. At 23 of the endoscopy episodes children were already receiving systemic steroids; 8 did not have GI-GvHD on histology, 15 did.

Conclusion
Endoscopy induced a change in direction of IST on 22 episodes: 18/43 patients were not receiving systemic steroids and had increased IST after detection of GI-GvHD; 4/23 patients already receiving steroids had IST reduced following the absence of GI-GvHD on histology. Overall, clinicians felt the procedure made a difference to patient management in over 70% of events.

Diagnostic flexible gastro-intestinal endoscopy in children post Allo-HSCT is associated with a high risk of complications compared to other patient groups, this should be reflected in the consent process.

Schwachman-Diamond syndrome: 30 years' experience of a tertiary referral clinic

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Background:

Schwachman-Diamond syndrome (SDS) is an autosomal recessive multisystem disorder. Exocrine pancreatic insufficiency, skeletal abnormalities and bone marrow dysfunction are characteristic. Whilst neurodevelopmental problems are common and most carry SBDS mutations, the phenotypic presentation is variable. Unique clinical features are described in some patients.

Objectives:
To determine presentation, clinical course, and genetic characteristics of children with SDS reviewed in the last 30 years.

Methods:
All patients who attended our SDS clinic between 1991 and 2021 were identified from the hospital database. Information about clinical history and symptoms, gene mutation, relevant imaging, blood, and stool parameters was obtained from our records.

Results:
Forty patients were included (21/40 female 52.5%). Diagnosis was genetically confirmed in 35/40 children (87.5 %). Most children showed symptoms in the neonatal period (16/40, 40%). The median age at diagnosis was 3.5 years (range: 6 months-13 years). The most common presenting complaint was failure to thrive (21/40, 52.5%).
Mild transaminitis was seen in 5/40 (12.5%), 2/40 (5%) presented with acute liver. Liver functions recovered spontaneously.

neutropenia (80%), 7/40 thrombocytopenia (17.5 %), and 16/40 anaemia (40%). 3/40 (7.5%) patients developed aplastic anaemia, 1/40 (2.5%) developed myelodysplastic syndrome. 4/40 (10%) patients required granulocyte colony stimulating factor (G-CSF). 5/40 (12.5%) patients underwent bone marrow transplantation, three of them died.
28/40 (70%) had skeletal anomalies: 15/40 (37.5%) metaphyseal dysostosis 15/40 (37.5%), 9/40 (22.5%) rib cage abnormalities, 2/40 (5%) thoracic dysplasia initially felt to be due to Jeune syndrome; 1/40 (2.5%) radial aplasia.
Retinal problems were reported in 2/40 (5%) patients; hearing difficulties in 4/40 (10%). 1/40 (2.5%) child had severe tracheomalacia requiring aortopexy and thymectomy.
2/40 (5%) had urinary problems: 1/40 nephrotic syndrome;1/40 hydroureter with hyperoxaluria.

Abnormal abdominal imaging was reported in 17/40 (42.5%): 15/40 (37.5 %) Pancreatic lipomatosis,1/40 (2.5%) atrophic pancreas,1/40 (2.5%) coarse liver.
Low faecal elastase was found in 33/40 (82.5%) patients. 3/40 (7.5%) showed gradual recovery of exocrine pancreatic function with normalisation of faecal elastase.
20/40 (50%) of patients had dental abnormalities. Learning difficulties and behavioural problems were reported in 20/40 (50%).

Assessment of height and weight revealed 11/40 (27.5%) patients had a weight below 2nd centile, 16/40 (40%) patients' height was below 2nd centile. Micronutrient deficiency were documented in 24/40 (60%) patients. 16/40 patients (40%) required enteral tube support in early childhood. One child required inpatient PN in the neonatal period (2.5%).

9/40 (22.5%) suffered from atopy: 15/40 (37.5%) atopic dermatitis, 4/40 (10%) asthma in 4/40, 4/40 (10%) food allergy, 2/40 (5%) allergic rhinitis. 5/40 (12.5%) children had a high IgE.

Conclusion:
SDS is a heterogenous condition with a variable phenotype. Whilst most of our patients presented with the classical triad of haematological problems, skeletal abnormalities and exocrine pancreatic insufficiency, some features reported in our cohort were not previously described.

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Wednesday 26th April 2022

Plenary Abstract

CAPGAN Session

Are Asian children more likely to develop Paediatric Inflammatory Bowel Disease? A study of Incidence rates in West Yorkshire

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Introduction and Aims

The incidence of Paediatric Inflammatory Bowel Disease (PIBD) including Ulcerative Colitis, Crohn's and Inflammatory Bowel Disease – Unclassified has been increasing globally and in the United Kingdom. A group of diseases with multifactorial etiology, diet, genetics and environmental factors have all been implicated in the development of PIBD. Traditionally thought of as a Caucasian illness, rates of incidence are stable in North America and Europe, however have been increasing in South East Asia and Africa. Few ethnicity studies have previously investigated the paediatric IBD population. This project aimed to analyse ethnic variations in the incidence of PIBD in West Yorkshire.

Methods
This is a retrospective study where data from all new colonoscopies between December 2017 and December 2019 at Leeds Children's Hospital (tertiary centre for Paediatric Gastroenterology in West Yorkshire) were analysed for patients with new diagnosis of PIBD (single user only). Ethnicities were divided into three categories: White British, Asian (including Indian, Pakistani, Bangladeshi and Middle Eastern) and Other (Black Caribbean and Mixed). ONS school pupils' data and ONS West Yorkshire ethnicity population estimates from January 2020 were utilised to calculate incidence rate per ethnic category. Statistical significance was calculated through the Pearson chi-squared test.

Results
Out of 157 patients, 75 had newly diagnosed PIBD, 39 patients with Crohn's, 23 with IBD-U and 13 with UC. 21 patients were Asian, 34 were White British and 3 were of Other ethnicities (17 patients did not have their ethnicity documented). Incidence of PIBD in Asian children was 10/100,000 children per year, White British 7/100,000 per year and Other 4/100,000 per year. Asian children have a significantly higher incidence rate of PIBD, taking into account their populations in the West Yorkshire as compared to White British and children from Other ethnicities ($p<0.001$).

Summary
While this a small study group, statistically significant results were found showing ethnic variation in the incidence of PIBD, with Asians having higher incidence rates. This has implications for services; additional investment into community support is required for these patients and their families as these groups are associated with lower socioeconomic backgrounds and possible language barriers. This is consistent with adult studies which have found higher incidences in Indian populations however admittedly, some UK based studies show lower rates of incidence in the Asian population.

Conclusion
Our study shows Asians to have a significantly higher incidence of PIBD, however further multi-centre studies are required to explore this and to identity factors that are responsible for the rising incidence of disease.

POSTERS

GASTROENTEROLOGY AND GENERAL

G1

Persistent hypo-albuminemia in Intestinal Lymphangiectasia: A multi-therapy approach in a rare condition. A case Report.

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Summary
A 7-month-old boy was referred to the Paediatric Gastroenterology Department with protracted diarrhoea, persistent hypo-albuminemia, electrolyte disbalance and failure to thrive. He had presented 2.5 months earlier with abdominal distention, pedal oedema, and generalized pallor. A mature cystic teratoma was found after a CT of the abdomen, followed by surgical resection. The histology was compatible with the above and the ascitic fluid had elements of a transudate. The initial oncologic investigations identified a low IgG serum level, with normal IgA and IgM, as well as low lymphocytes. Urine protein loss was out ruled. An oesophagus-gastro-duodenoscopy showed whitish mucosa in duodenum. Colonoscopy up to transverse colon was normal. The histology showed normal oesophagus. The stomach had vascular ectasia, mild oedema and congestions within the lamina propria. D1 normal. D2 small areas of the lamina propria appeared to be oedematous within the villous structures and a focal area of haemorrhage was noted. There was no obvious evidence of generalised dilated lacteals. The colonic biopsies were normal. He had a mildly raised faecal alfa-1-antitrypsin with normal faecal elastase. The initial management included Total Parental Nutrition and albumin infusions, followed by subcutaneous octreotide and tranexamic acid to reduce the albumin loss. After the patient's albumin stabilized and gained weight, a low-fat diet with a MCT high-containing formula were started. At discharged the patient still required SC octreotide to keep normal level of serum albumin, which continued to receive for 12 months. After 1 year of treatment, the SC Octreotide was weaned off gradually until discontinued. The patient kept an adequate level of Albumin, his lymphopenia and hypogammaglobulinemia was resolved, and he thrived accordingly. He has been kept on low fat diet with high MCT formula to date. Accidentally, the patient ingested food with LCT (cross contamination) and developed profuse, auto-limited diarrhoea for 5 days without changes in his biochemistry. It was decided that the patient should remain on low fat diet for the foreseeable future.

Background
Protein loosing enteropathy in children is a rare condition with major repercussions in nutrition and development. In early stages of life, congenital diarrhoea and cow's milk allergy are the main causes. Coeliac disease and Cystic Fibrosis could also debut with such features. Intestinal lymphangiectasia, primary or secondary, is a rare condition without an established epidemiology to date. There is no predominance of gender or race. The cases reported have been of sporadic origin {1} without an identified genetic aetiology.
The mean age of diagnosis is 12 years of age [1]. Primary causes include vascular malformations of childhood [2} and secondary causes follow a long list of pathologies that could result in lymphatic drainage blockage. The resulting ectasia causes dilatation of the lymphatics with loss of lymph leakage into the bowel leading to hypoproteinaemia, oedema, lymphocytopenia, hypogammaglobinaemia – accompanied with immunological abnormalities – as well as micronutrients deficiency including calcium, iron and fat-soluble vitamins, among others {4}

The symptoms of Intestinal Lymphangiectasia may include chronic diarrhoea, limb oedema, ascites and pleural effusions. Chylothorax could be a rare presentation {2}.

Diagnosis is made through endoscopy and histological findings that confirmed the dilated lymphatics.

The management includes dietary modification with high doses of medium-chain triglycerides, total parenteral nutrition, albumin infusions and, in some series, octreotide, tranexamic acid, corticosteroids and surgery have been reported {3}.
We report a case of intestinal lymphangiectasia clinically presenting as persistent hypoalbuminemia, protracted diarrhoea and failure to thrive. The endoscopic findings were in keeping with the disease and the management of this case involved the participation of gastroenterologist, immunologist and dietitians.

Case report
A 7-month-old boy who was diagnosed with a mature cystic teratoma after presenting acutely ill to his local hospital. His initial complaints were swollen abdomen and feet, pallor and vomiting. Term born via caesarean, he had a hyper-sensitive gag reflex and frequent episodes of vomiting. During his recovery from surgery he developed diarrhoea, up to 10 a day, with persistent hypoalbuminemia that did not improve to albumin infusions and diuretics, as well as electrolyte disturbances that required often supplementation. At admission his weight was static but progressively he started to emaciate.

Investigations
Table 1: Biochemistry and Imaging investigations from Diagnosis, discharge, and outpatient follow-up. (NB: empty cells are investigations not performed at the time)

Parameter	**At diagnosis**	**On TPN**	**+ High MCT formula + low fat diet**					
			Octreotide BD	+Tranexamic Acid	OFF Octreotide	Octreotide OD	OFF Octreotide	LCT accidental ingestion
WCC (x10'9/L)	6.0	6.4	3.8	4.7	3.8	4.2	5.6	8.4
Lymphocytes (x10'9/L)	0.75	0.96	0.69	0.98	1.06	1.78	1.84	1.45
Albumin (g/L)	11	17	27	20	13	29	40	42
ALT (IU/L)	68	42	21	23	21	37	35	33
Ionized Calcium (mmol/L)	1.11	1.86	2.31	2.13	2.35	2.35	2.01	2.1
Total IgG	<0.40							
F. Elastase (ug/g)	248						>500	
Alpha-1-Antrypsin (0.00-0.49 mg/g)	0.69							
CT Abdome	Large predominantly cystic mass lesion in the left abdomen with a prominent fatty component and							

n (before surgery)	calcifications within the adjacent mass-effect. Displacement of the surrounding structures namely the spleen superiorly, left kidney posteroinferiorly, stomach and pancreas anteromedially and the bowel loops in the right abdomen. Aorta and its major abdominal branches are also displaced by the lesion. The infrahepatic IVC is stretched and mildly thinned out along the inner aspect of the lesion. Normal liver, gall bladder, and portal flow. No bowel wall thickening seen.		
CT Abdomen (1 month after surgery)	Small bowel and colon appear similar than previous study. There is the suggestion of subtle diffuse bowel wall thickening and the impression of diffuse increased density in the bowel wall. Unremarkable appearance of the mesentery. No lymphadenopathy. The liver demonstrates diffuse lower attenuation than expected. This could reflex oedema, without enlargement. Findings of the bowel are non-specific and could reflect intestinal lymphangiectasia.		

Treatment

Initially the patient received albumin infusions and diuretics. He remained on breastfeeds and age-appropriate purees. Additionally, he was started on enteral feeds via NG with an extensively hydrolysed formula with MCT that he failed to tolerate (vomiting). After referral to Gastroenterology he was started on total parental nutrition. Initially the lipids were restricted due to the severity of the liver derangement and progressively introduced later when the latter was resolved. However, despite adequate levels of nutrients and resolution of diarrhoea and vomiting his albumin levels remained low requiring albumin infusions. After a multidisciplinary discussion with the Immunology department and Dietitians the patient was started on subcutaneous octreotide looking to lower the lymph flow and losses in the bowel. He was started at a 100µg/kg dose, twice a day. During the initial 3 weeks of treatment the patient still required weekly albumin infusions. Tranexamic acid was later started without satisfactory results 1 week after treatment and therefore it was stopped.

Outcome and follow-up

At discharge the patient was reviewed weekly in the Day-case unit with albumin measurements that remained as of discharge between 17 and 20 for 4 weeks. These static changes led to the decision to stop the octreotide. Within 7 days the patient gained 2 kg in average and required an intravenous infusion of albumin as it dropped to 13 with clinically evident oedema. He was also re-commenced on octreotide SC OD only. The following 4 weeks showed progressive normalization of albumin levels building up to 40 when titration of octreotide by 20 mcg/weekly was started. The results of the titration were favourable and the patient kept normal albumin levels, without diarrhoea until complete withdrawal of Octreotide. The patient achieved full growth (weight and height) for his age, adequate neurological development and normalization of all his serological values (immunoglobulins and lymphocytes).

Accidentally, the patient ingested food with LCT (cross contamination) and developed profuse, auto-limited diarrhoea for 5 days without changes in his biochemistry. It was decided that the patient should remain on low fat diet for the foreseeable future.

Discussion

Intestinal lymphangiectasia still possess a challenging physiopathology to diagnose and treat. Multiple case reports and cohort studies have summarized the diagnostic features of primary and secondary IL reflected in serology and endoscopy {1, 5, 6}.

The limitation on large series makes the different treatment modalities more of anecdotical than factual experience. However, adequate response in both the short and long term have

been achieved with the use of octreotide. Table 2 summarizes the different studies and doses used (when available).

Table 2: Octreotide management in Intestinal Lymphangiectasia (*modified from Alshikho, 2016*).

Author	Year	Age	Gender	Indication	Outcome
Bac DJ et al	1995	38	M	Hypoalbuminemia	Improvement
Kuroiwa G et al.	2001	21	M	Hypoalbuminemia	Improvement
Klingenberg RD et al.	2003	27	F	Generalized hydrops	May be effective
Filik L et al.	2004	25	F	Severe oedema and diarrhoea	Improvement
Makhija S et al.	2004	-	-	Severe oedema	No improvement
Balboa A et al.	2004	-	-	oedema, diarrhoea	Improvement
Altit G et al.	2012	15	M	Hypoalbuminemia	Improvement
Suehiro K et al.	2012	63	M	Oedema, diarrhoea	Improvement
Al Siani S et al.	2012	Baby	-	Edema	Improvement
Prasad et al.	2018	Various	M-F	Edema	Improvement

Tranexamic acid was only reported in one publication with octreotide given simultaneously. The treatment was abandoned due to lack of response.

In the adult series, nutritional management (parenteral and enteral) has been the most frequently used, with mixed results. The largest review of published articles has concluded that the long term of nutritional supplementation with MCT oils was reflected in the improvement of the immune system and less frequent admissions for albumin infusions {2}. This was also seen in the largest paediatric cohort published recently {5}.

Our patient received all the treatment suggested by literature in unison. The nutritional support improved the weight and height of the patient. Tranexamic acid did not make a difference in the frequency of albumin infusions. Octreotide (180 mcg SC BD) with nutritional support (high protein, low fat, high MCT concentration formula and low-fat diet) for 12 and 18 months (after discharge), respectively, had the most significant results (normalization of albumin levels, immunoglobulins and lymphocytes).

Conclusion

IL is a challenging diagnosis and requires a multidisciplinary team support to achieve adequate a satisfactory treatment. The results are widely variable perhaps due to the spectrum of the disorder that has not been fully described given he rareness of the condition.

Octreotide has shown to be a promising therapy for this disorder, however more extensive studies and cohorts are required. The most satisfactory treatment reported to date is a low-fat diet and high-MCT supplements.

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G2

Incomplete bolus transit and patterns of oesophageal motility in children with repaired oesophageal atresia

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Introduction
Abnormal oesophageal motility is common after oesophageal atresia (OA) repair and often lead to range of symptoms such as dysphagia, regurgitation and gastro oesophageal reflux. High resolution oesophageal impedance manometry (HROIM) is the gold standard to investigation oesophageal motility and bolus transit. We aimed to characterise patterns of oesophageal dysmotility and frequency of incomplete bolus transit in children with repaired OA.

Method
Retrospective analysis of HROIM from children with repaired OA. 5 liquid swallows (with dioralyte) were assessed for the following parameters: integrated relaxation pressure (IRP), distal contractile integral (DCI), distal latency (DL) and peristalsis pattern (intact, failed, or ineffective). Impedance tracing was used to assess bolus transit (complete when the impedance returned to baseline or incomplete when impedance failed to return to baseline at any sensor). Incomplete bolus transit was the divided into upper, lower of whole oesophagus based on location.

Results
Forty-five wet swallows were assessed from 9 patients, 4 (44%) Females. Mean age 10.5 (±4.6) years. All children complained of difficulty in swallowing certain types of solid and/or liquid food. None of the children had intact peristalsis, 5 had ineffective and 4 had failed peristalsis. One child (11%) had a complete bolus transit despite an ineffective peristalsis, 3 (33.3%) had incomplete bolus transit in the whole oesophagus, 4 (44.4%) had incomplete transit in the upper and one (11%) incomplete transit in the lower oesophagus. Mean (±SD) IRP in the failed peristalsis group was 8 (±2.6), and in the ineffective group was 20.8 (±5.1), DCI 703.7 (±476), DL 6 (±1.1) and peristalsis breaks were 6.3 (±2.5)cm.

Conclusion
Impaired oesophageal motility appears to be universal in children with repaired oesophageal atresia and dysphagia. Failed (absent) peristalsis and ineffective oesophageal peristalsis are the common types of oesophageal dysmotility. Majority of children (44%) had incomplete bolus transit in the upper oesophagus while a third (33%) had incomplete transit in the whole oesophagus. Only about 10% had complete bolus transit. Children also appear to have a large peristalsis break of over 6 cm possibly contributing to their ineffective oesophageal motility. HROIM is a valuable tool to characterise oesophageal dysmotility and bolus transit across the oesopahgus in children with repaired oesophageal atresia and can provide clinical guidance and valuable prognostic information to the affected children.

G3
Dyssynergia and chronic constipation

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Introduction/Background
Chronic constipation is a frequent cause of referrals to tertiary gastroenterology centres. In children where medication and lifestyle modifications have failed to alleviate the issue, anorectal manometry can be used to examine the functional mechanisms surrounding defecation, including the relaxation of the anal sphincters, the rectal pressure increase and the co-ordination of these two manoeuvres when trying to defecate. Dyssynergia is defined as an increase in pressure or failure to relax of the anal sphincters when attempting defecation, with or without an increase in rectal pressure. There are four types of dyssynergia based on which combination of issues are present
.
Aim
The aim of this study was to examine the rate of dyssynergia diagnoses in paediatric patients with chronic constipation and investigate whether there is any demographic differences in the patients presenting with different types of dyssynergia.

Subjects and methods

A retrospective review was carried out of all patients who attended Evelina London Children's Hospital for awake high resolution anorectal manometry with constipation as a referral reason in the period March 2019 – November 2021. 62 patients were identified, of which 45 (29 male, average age: 10.1 years) had complete data for the push manoeuvre recorded. The data for each of these patients were reviewed to identify whether dyssynergia was present and the type of dyssynergia, as well as their age at time of investigation and gender.

Results
Dyssynergic defecation was found in 26 of the 45 children (58%), with 20 identified as Type I and 6 identified as Type II. A chi squared test showed no significant difference ($p > 0.05$) between the gender split across all children with constipation, children with Type I dyssynergia and Type II dyssynergia A two-tailed t-test also showed no significant difference ($p > 0.05$) between the ages of the Type I and Type II groups.

Summary and Conclusion

Dyssynergia is a likely contributor to chronic constipation, with 58% of the patients presenting for anorectal manometry at our centre being diagnosed with either Type I or Type II dyssynergia. Age and gender did not affect the likelihood of presenting with dyssynergia and were not predictive of the type of dyssynergia diagnosed.

G4

Management of extremely complex constipation patients in a nurse-led clinic with health play specialist involvement

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Management of extremely complex constipation patients in a nurse-led clinic with health play specialist involvement

Introduction:
Children with idiopathic chronic constipation are extremely challenging to manage. Before review by tertiary specialist teams, Children have suffered for years with constipation, which leads to significant behaviour related issues around toileting, despite adequate medical treatment. The involvement of the health play specialist (HPS) in the nurse-led constipation clinic is to address behaviours around toileting.

Aims:
To demonstrate involvement of HPS in the clinic led to improved outcomes for children and families. This will be identified through the use of parental satisfaction questionnaires and four case studies.

Case studies:

We demonstrate four extremely complex constipation cases referred to clinic and successfully managed by HPS with unique individualised approach with support and plans for parents and school.

9-year-old boy with history of sexual abuse, with soiling and wetting accidents. 5 sessions with the HPS, focusing on toileting behaviours. Sessions involved desensitizing play around the body, use of toilet related games/activities, videos and mobile apps. All issues resolved.

5-year-old boy: Stool with-holding, will only pass stools in a nappy and soiling. 8 sessions with HPS - Intense toilet training for 2-4 days with hourly sits. Reward charts to compliment interests, targets adjusted when goal reached, prizes given. Desensitization play around toileting behaviours. Using analogies to improve behaviour, he loved dustbin lorries – body empties the waste (poo) just like the bin men collecting the rubbish to get rid of it from home. No more accidents, independent toileting achieved

5-year-old girl Issues with constipation, soiling and toilet refusal. All bowel movements in knickers.
Complete HPS treatment virtually, secondary to COVID restrictions. 6 Video call sessions- individualised plan of regular sits to relax, with no pressure to perform. To do an activity whilst on the toilet. Visual pictures/videos explaining how the body works and the plan was adjusted on the video. Rewards when child reached the target, and prize sent in post. Outcome -no fear of the toilet, bowels open on the toilet, no accidents.

8 year old boy premature 33 + 5 weeks. Constipation with overflow since birth. Referred to surgeons for rectal biopsies and botox injections at the age of 3 but no improvement. Age 4 admitted to the ward for 1 week for observation, transit marker study and toilet training was

unsuccessful. Referred to another unit for second opinion at parental request. Started to refuse medications. ACE surgery discussed. Diagnosed with Autism at 7 years.

Invited for a week of intense toileting with HPS, hourly sits and desensitization activities on medication taking, toileting, with-holding, signs and signals of body. Reward system in place, when reached expectations, reward given by hospital. Outcome bowels open daily in the toilet, wears pants all the time.

Satisfaction questionnaires were given to parents and feedback was extremely positive.

Conclusion: The health play specialist involvement in the nurse led constipation clinic allows for individualised intervention guided by the child's needs. Pharmacological interventions alone may be unsuccessful without addressing behavioural needs.

G5

Use of Anterior Abdominal Wall Blocks in Paediatric Percutaneous Endoscopic Gastrostomy Insertion

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Introduction

Anterior abdominal wall blocks (AAWB), including rectus sheath (RSB) and transverse abdominis plane (TAP) blocks are frequently used in surgical procedures including umbilical hernia repair and midline incision operations.

AAWB is a well-recognised method of post-operative pain management.

The European Society of Anaesthesiology 2018, recommends the use of local infiltration with a long-acting anaesthetic agent and an anterior abdominal wall block (RSB/TAP) in laparotomy where resources permit.

Limited information is available for the use of AAWB blocks in pain management for paediatric percutaneous endoscopic gastrostomy insertion (PEG).

Aim
This project intended to compare the outcomes following use of AAWB and local anaesthetic in paediatric PEG insertions compared to local anaesthetic (LA) alone.

Primary outcomes measures were post-operative pain scores, breakthrough pain management during the first 12 hours post-procedure and length of hospital admission.

Method
Patients undergoing Gastroenterology-inserted PEG were identified through operator diaries between November 2020 to November 2021.

Records were reviewed to evaluate intra-operative analgesic agents, post-operative pain scores at 1, 4, 8 and 12 hours post-procedure and length of hospital stay.

Results
30 patients were identified.

18 received LA alone (bupivacaine, levobupivacaine or chirocaine) and 12 received combined pain management with LA and AAWB.

Age range of patients was similar in the LA and combined groups (3 – 128 months and 4 - 170 months).

Indication for gastrostomy were similar in both groups; faltering growth (11, 5), NG dependence (9, 6), unsafe swallow/feeding difficulties (5, 3).

The average length of stay was longer in those with LA alone [2.2 (1 to 5 days)] compared to the combined group [1.9 (1 to 6 days)].

Discharge on day 1 was lower in LA compared to the combined group (38.9%, 58.3%), similar

on day 2 (27.7%, 25%) and a higher proportion stayed for greater than 3 days (33.3%, 16.7%). Breakthrough pain relief during the first twelve hours post-procedure included intravenous morphine (5.6% [LA] versus 0%[combined]), oral morphine (27.8% [LA] versus 16.7% [combined]), intravenous paracetamol (33.3% [LA] vs 58.3%[combined]), oral paracetamol (72.2% [LA] vs 75% [combined]), ibuprofen (33.3% [LA] vs 50%[combined]) and rectal diclofenac (5.6% [LA] vs 8.3%[combined]).

Positive pain scores at 1, 4, 8 and 12 hours were similar; LA [16.7%, 16.7%, 11.1%, 0%] and combined [16.7%, 25%, 8.3%, 8.3%].

Conclusion
On average patients who had AAWB had a reduced length of stay and were more likely to be discharged on day 1. This is also shown in patients who stayed for two or more days.

The results have shown a lower requirement of intravenous opiates in patients with AAWB compared to those who had a local anaesthetic. Use of non-opiate pain relief was similar in both groups. This might reflect standard pain management protocol. Assessment of pain scoring was similar across both groups. However, pain scoring is subjective and can be difficult to standardise amongst clinicians.

Our sample size is currently restricted to 30 patients.

We plan to expand our data collection to prospectively evaluate outcomes associated with AAWB versus LA alone, prior to its uniform implementation in practice.

G6

How the Pandemic has Affected Paediatric Gastroenterology, Hepatology and Nutrition Training in the U.K.

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Background

The Paediatric Gastroenterology, Hepatology and Nutrition (PGHAN) GRID is the U.K. pathway for training. Training is overseen by College Specialist Advisory Committees (CSACs) and monitored in previous years through surveys, which have been used as a springboard to implement improvement and change. The Coronavirus pandemic has been well documented with impact on staffing, training, and mental wellbeing of healthcare professionals. We aimed to look holistically at the PGHAN training during a 6-month period of the pandemic.

Aim

• To understand the state of PGHAN training and trainees during the Coronavirus pandemic.
• To provide clarity on the challenges and compare with data from previous surveys.
• To highlight positive practices that can be continued or reinforced.

Subject and methods
Trainees working between March 2021 and September 2021, after the 2nd U.K. lockdown, were surveyed anonymously using an electronic form. The survey included a combination of question types, including Likert scales, yes/no and sections for free text. Initial distribution of the survey was August 2021 and reminders were sent following the post before the survey was closed in November 2021.

Results

Surveys were completed by all 23 PGHAN GRID trainees, comparing favourably to 100% and 75% response rates in previous surveys in 2016 and 2018 respectively. 43% of trainees were less than full time (LTFT), with 26% at ST8 level. 43% of trainees were personally affected by Covid. 70% reported feeling safe at work. Online teaching was useful to 87% of trainees, though only 17% could attend >50% of sessions. 74% requested more online sessions. Of the 19 trainees that attended the virtual Trainees' Day, 63% found it useful. 59% of trainees were not signed off for OGD, with 23% citing a lack of Joint Advisory Group (JAG) approved course attendance as a reason.

Summary and Conclusion

The survey received an excellent response rate. Notably, most trainees felt safe at work though a minority felt that their mental health was negatively affected with Covid-19. Most trainees felt supported by their team members during the pandemic. Endoscopy lists were felt to be reduced, though list numbers after the second lockdown were comparable to pre-pandemic year 2018. This suggests that services returned to near normal, though numbers still require improvement. The list numbers during the height of the pandemic were not captured. Availability and access to JAG accredited Paediatric endoscopy courses needs to be prioritised. Rota coordinators should be aware that almost half the PGHAN trainees are

LTFT, a more recent phenomenon that requires dynamic solutions. Online teaching sessions were very well received, and we should embrace online strategies for education, training, and support. The attendance to online teaching has been an issue suggesting more support is required and the Trainees' Day attendance should be encouraged. Trainee access to the HPN clinic should be improved, and barriers to this should be explored. The overall percentage time worked in sub-speciality has improved from 2018, which should be carried forward for subsequent years.

Table 1

		Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)
Pandemic related questions	Felt safe at work			30.4	30.4	39.1
	Negative affect on mental health	13	17.4	47.8	17.4	4.3
	Improved working environment	8.7	30.4	43.5	13	4.3
	Online teaching useful			13	4.3	82.6
	Online teaching attendance >50%	21.7	39.1	21.7	8.7	8.7
	More online teaching					
	PGHAN services preserved	13	13	30.4	43.5	
	Supported by team		17.4	17.4	47.8	17.4
Endoscopy	Reduced endoscopy lists	8.7		13	26.1	52.2
	OGD confident	4.3	4.3	13	21.7	56.5
	Colonoscopy confident	56.5	13	17.4	13	

Table 2

	2016 (%)	2018 (%)	2021 (%)
Minimum 70% working in PGHAN	68	57	65.2
<33% out of hours		78	73.9
Complex safeguarding involvement			82.6
Home parenteral nutrition clinic attended			47
Transition clinic attended			56.5
Attendance to trainees' day 14/7/21			65.2
>2 endoscopy lists per month		67%	68%

G7

Use of oral gut decontamination in a level 3 neonatal surgical intensive care unit

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Introduction
Neonates with surgical gastrointestinal conditions on prolonged parenteral nutrition (PN) are at higher risk of blood stream infections caused by enteric bacteria, which is thought to be due to bacterial translocation. This may lead to poor feed tolerance and malnutrition. Our unit commences oral gut decontamination (OGD) for selective neonates at high risk of bacterial translocation. To our knowledge our unit is unique in the use of OGD to minimise risk of sepsis and poor growth. This study aimed to describe unit practice and review outcomes.

Aims
1. To review the number of episodes of sepsis before and after OGD.

2. To review weights and feed volumes before and after treatment.

Subjects and methods

Retrospective data was collected from single tertiary surgical neonatal unit. Patients who had received OGD over a 2-year period were identified using BadgerNet. Patient records, drug charts and electronic results system were reviewed. After testing for normality, z-scores for weight and feed volumes before and after treatment were compared using paired t-test and Wilcoxon matched pairs test respectively. Sepsis rates before and after treatment were analysed using a two-tailed chi-squared test. P-values of <0.05 were considered significant.

Results
Over the 2 year period 13 patients received OGD. (Table 1)

All patients had a surgical diagnosis. One patient died, this was not due to sepsis and they were not on OGD at the time of death.

Indications for starting OGD included previous sepsis episodes, inability to increase enteral feeds due to high stoma output, and poor weight gain.

The mean PN volume was lower following OGD (70mls/kg/day vs. 102mls; p=0.07). Prior to treatment 23% of patients were exclusively on maternal breast milk. Mean enteral feed volume increased after OGD (44mls/kg/day vs. 56mls/kg/day p=0.57). There was marginal increase in weight z-scores after OGD (-1.56 vs. -1.51, p=0.83).

Episodes of sepsis are shown in table 3. Before treatment there were 16 episodes of sepsis; 25% of episodes were gram-negative organisms, 50% gram-positive and 25% mixed. After treatment there were 14 episodes of sepsis of which 14.2% were gram-negative, 64.3% gram-positive and 21.4% mixed.

Summary
Use of OGD in neonates has very limited evidence base and is mainly used in surgical babies. The protocol on our unit is extrapolated from adult studies.
In our study we saw an increase in weight, and enteral feed volumes after initiation of OGD for most babies, although neither change reached statistical significance. We also saw a decrease in the proportion of gram-negative sepsis after initiation of OGD. This is due to the antibiotics used mainly targeting gram-negative organisms.

This study adds to the limited literature regarding use of OGD in neonates. Findings of this study were limited by small sample size and heterogenous population.

Conclusion

OGD is an infrequently used treatment which may have a role in reducing sepsis secondary to bacterial translocation in this unique population. Further multicentre trials are needed to evaluate the impact of this practice.

Table 1. Patient charateristics

	All patients (n=13)
Gestational age, median (range)	31+2 (23+0, 36+4)
Birthweight, g, median, (range)	1765 (460, 2890)
Male, n (%)	6 (46)
Diagnosis	
NEC and perforation, n (%)	6 (46)
Gastroschsis, n (%)	4 (31)
Spontaneous intestinal perforation, n (%)	1 (8)
Other, n (%)	2 (15)
Ileo-caecal valve present, n (%)*	8 (67)
Stoma, n (%)	11 (85)
Age at starting OGD, days median, (range)	72.0 (31, 132)
Duration of decontamination, days median, (range)	41 (8,147)

**when documented*

Table 3. Organisms isolated in blood cultures before and after gut decontamination

	Before gut decontamination		**After gut decontamination**	
Organism	Number of BSIs with positive blood cultures n= 16 (% of total BSI)	Number of children (n=10) with BSI due to microorganism (% of children)	Number of BSIs with positive blood cultures n= 14 (%of total BSI)	Number of children (n=10) with BSIs due to microorganism (% of children)
Gram positive				
Coagulase-negative Staphylococci	4 (25)	3 (30)	6 (42.9)	6 (60)
Enterococcus faecalis	3 (18.7)	3 (30)	3 (21.4)	2 (20)
Bacillus cereus	1 (6.3)	1 (10)		
Gram negative				
E. Coli	1 (6.3)	1 (10)		
Klebsiella sp.	1 (6.3)	1 (10)	1 (7.1)	1 (10)
Enterobacter sp.	1 (6.3)	1 (10)	1 (7.1)	1 (10)
Serratia marcescens	1 (6.3)	1 (10)		
Mixed infections	4 (25)	3 (30)	3 (21.4)	3 (30)

BSI = blood stream infection

G8

Evaluation of an Online Workshop for young people with Anxiety and Physical Symptoms

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Introduction: The Paediatric Gastroenterology and Chronic Pain services at the Evelina London Children's Hospital set up a virtual anxiety management workshop for young people aged 11-17, with Physical Symptoms, and their parents. Based on Cognitive-Behavioural therapy (CBT), this workshop provided psychoeducation and strategies to manage general and health specific anxieties. Three online workshops took place between October 2020, and September 2021.

Aim: To evaluate participants' outcomes of and feedback from the Managing Anxiety and Physical Symptoms workshop

Participants and Methods: Twenty-two participants attended the three groups, 12 of which were young people, who were open to the Gastroenterology Service, and their parents. All participants were invited to complete brief pre and post questionnaires, where they were asked three questions exploring their understanding of anxiety, knowledge of anxiety management strategies and confidence in using these strategies. The questionnaires included a combination of 5-point Likert scale responses (1 = no confidence/knowledge, 5 = extremely confident/Knowledgeable). The quantitative data was analysed using descriptive statistics (Mean; M, and Standard Deviation; SD), and free text qualitative date was collated and reviewed.

Results: After the workshop, the young people indicated a self-reported improvement in their understanding of their anxiety (M= 2.33 to 3.9), their knowledge of strategies to manage anxiety (M=2.5 to 3.9) and their confidence in using strategies to manage their anxiety (M=2.33 to 3.71). The parents also reported a similar improvement across all these areas.

In their feedback forms, the majority of the participants found the workshop helpful (94%) and indicated that learning about the strategies to help support them to manage anxiety as one of most helpful parts of the workshop.

Summary and Conclusion: Overall, participants appeared to benefit from the workshops in terms of their knowledge of and confident in implementing different strategies to manage anxiety, with both young people and parents rating themselves higher on these aspects following the workshop. This was also reflected in the evaluation feedback data. Future work could look at the impact of the group on their presentation of physical symptoms and the sustainability of their new knowledge/skills. In conclusion, this supports the continuation of psychologically led workshops with adaptions to be implemented from participants' feedback.

Table 1. Pre and post questions scores

		Understanding of anxiety	Knowledge of anxiety strategies	Confidence in using strategies
Young Person	**Pre (n=18)**	M=2.33, SD=0.84	M=2.50, SD=0.92	M=2.33, SD=0.91
	Post (n=21	M=3.90, SD=0.62	M=3.90, SD=0.79	M=3.71, SD=0.78
Parent	**Pre (n=18)**	M=3.00, SD=0.91	M= 2.67, SD=0.91	M=2.61, SD=1.14
	Post (n=16)	M=4.25, SD=0.68	M=4.06, SD=0.57	M=4.00, SD=0.82

G9

Atypical presentation of coeliac disease with acute onset generalized oedema and hypoalbuminemia, but no GI symptoms

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Background/Introduction: Coeliac disease (CD) is a chronic immune-mediated disease of the small intestine that occurs in genetically susceptible individuals, characterized by an aberrant immune response to gluten. Originally considered as a malabsorption syndrome of childhood, CD is now recognised as a disease that can be diagnosed at any age, presenting itself through a wide variety of symptoms. Toddlers and young children with coeliac disease commonly present with diarrhoea, constipation, abdominal distension, irritability, malnutrition and other systemic symptoms. An acute presentation of protein losing enteropathy with generalised oedema in coeliac disease with no other manifestations of chronic GI disease is extremely rare and poorly described in published literature.

Aims: We describe an unusual case of coeliac disease in a 4-year-old boy, with no preceding history of GI symptoms or malnutrition, presenting acutely with severe hypo-albuminemia and generalised oedema. Our aim is to raise awareness of this commonly prevalent disease in the differential diagnosis of hypo-albuminemia, even in the absence of chronic GI symptoms.

Methods and Subjects: A 4-year-old boy was admitted to his local hospital with acute onset generalised oedema. He developed swelling of his legs, face and severe scrotal oedema. He had no other symptoms. He was thriving well with no significant medical background. In the absence of nephrosis and other obvious causes of hypo-albuminemia, he was transferred to tertiary GI centre for further assessment and management. Coeliac serology was not available prior to transfer.

Results: During his inpatient stay on the GI unit, blood tests showed a low serum albumin of 14 mg/L, total protein of 33g/L, normal liver function tests and normal inflammatory markers. Urine analysis did not show albuminuria in the nephrotic range. He was catheterised for urinary retention due to severe penile and scrotal oedema. He also needed intravenous treatment with 20% Human albumin. Whilst awaiting results for coeliac serology and other tests for protein-losing enteropathy, he underwent a gastro-duodenoscopy and ileo-colonoscopy as part of GI work-up. The duodenal mucosa showed typical features of coeliac disease with mucosal atrophy and scalloping, following which the coeliac serology/histology were expedited and the patient commenced on a strict gluten-free diet. His coeliac serology was back in 48 hours on request with a significantly elevated TTG IgA level of 17256 u/ml (normal 0-15) and positive endomysial antibodies. Histology confirmed coeliac-type enteropathy. Serology from his local hospital was also subsequently available with a significantly elevated TTG IgA. At follow up, the patient made excellent progress on a gluten-free diet, with normalisation of blood tests.

Conclusions and Summary: Acute generalised oedema with hypoalbuminemia may be the first presenting sign of coeliac disease enteropathy in a previously well child. In the absence of other common causes of hypoalbuminemia, testing for coeliac disease should be considered in the primary list of investigations for possible causes for protein losing enteropathy. Rapid coeliac serology is often available in most immunology labs and should be considered in similar acute presentations for a prompt diagnosis and treatment, avoiding unnecessary invasive investigations.

G10

Colonic volume changes in paediatric constipation compared to normal values

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Introduction/Background Functional constipation (FC) in childhood is common, with a prevalence estimated around 10%. To date, relatively little is known about colonic volume in children with FC.

Aim The primary aim of this study was to measure colonic volume in children of different ages with FC and also provide initial normal range values for healthy controls using MRI [1].

Subjects and Methods Nineteen healthy volunteers (age 16±2 y) and 16 patients with FC (age 11±3 y) participated in a recent MRI study investigating whole gut transit time (WGTT) under Ethics approval 17/WM/0049 [2]. The image data was analysed here for colon volumes as follows. Individual regional colon volumes were manually segmented on each slice using Medical Image Processing, Analysis and Visualisation software (MIPAV, NIH, Bethesda). The colon was divided into 4 regions: ascending colon (AC), transverse colon (TC), descending colon (DC) and sigmoid colon and rectum region (SC-R) and colon volume data were corrected for body surface area (BSA) using the Mosteller formula. Linear regression was used to assess the strength of the relationship between colon volume and WGTT
.
Results The total colonic volume corrected for BSA (Figure 1, right panel) was 309mL (243-384mL) median (IQR) for the young patients with constipation, significantly larger than that for the healthy controls 227mL (180-263mL) (p=0.0081). Regional colon volumes showed that the larger increase was between controls and patients was in the SC-R region (p=0.0410 Mann-Whitney one-tailed test) with 9 constipated patients having SC-R volume above the 95% CI of the control values. There was a positive correlation between the total colonic volume and WGTT, coefficient of correlation R=0.56, p=0.0005.

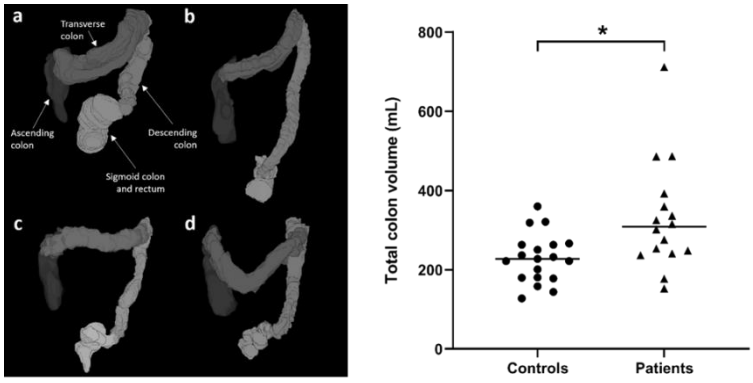

Figure 1: Left panel: 3D representations of the colon morphology from four different participants, (a and c) patients, and (b and d) healthy controls. Right panel: total colon volume corrected for both body surface area of n=19 control and n=16 patients with constipation. Horizontal lines: median, *p=0.0081 two-tailed Mann-Whitney test.

Summary In our study the total colon volume was found to be larger in the paediatric patients with FC than in healthy controls, where 63% of patients with FC had a colonic volume above the 75% centile of normal control values and 25% of patients had the colon volume above the 95th centile (upper limit of normal) of the healthy control values. There are no similar studies

to compare our data against. We also found a moderate but significant correlation of transit with colonic volume.

Conclusion This study provides novel data on colonic volume in paediatric functional constipation patients and initial normal range values. MRI allowed us to study the undisturbed, un-prepared colon in its physiological state. Further work is needed to increase the number of participants studied and continue to investigate the relationship between colonic volume and WGTT.

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G11

Prucalopride for Treatment Refractory Constipation in Children: A single Tertiary Centre Experience

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1) Paediatric Gastroenterology Department – RHC Glasgow, 2) Paediatric Surgery Department – RHC Glasgow 3) Paediatric Pharmacy Department – RHC Glasgow 4) Paediatric Radiology Department – RHC Glasgow

Introduction/Background:

Chronic constipation is a common condition in childhood, with an estimated prevalence of 3% worldwide (1). Commonly no cause is found (idiopathic constipation) although there are a number of important aetiologies to rule out during the evaluation of children with constipation. Pharmacological management is the mainstay of treatment, current NICE recommendations for refractory cases is for referral to surgical services for potentially more invasive therapies (2). Prucalopride is a 5-HT4 receptor agonist, it produces an enterokinetic effect to increase colonic motility. It is recommended as a treatment of refractory constipation in adult but, despite promise, there is little data supporting its use in paediatrics (4).

Aim:
To provide a single tertiary centre experience of using Prucalopride in paediatric patients with treatment refractory constipation.

Subjects and Methods:

5 female teenage patients (12-17yrs) average age at initiation 15yrs with treatment refractory constipation in our centre. Patients received a dose of 2mg once daily on an initial 1 month trial of treatment. Table 1 summarises the patient demographics and treatment outcomes. All patients had idiopathic constipation. 4 out of 5 (80%) had rectal biopsies that were normal. 3 out of 5 (60%) had previous transit studies with 2 out of 3 (66%) showing delayed elimination of markers. 1 out of 5 (20%) underwent manometry assessment and this was normal. 2 out of 5 (40%) patients had previous surgical therapy for their constipation with both patients undergoing an ACE procedure and 1 patient additionally receiving anal botox therapy.

Results:
There was a wide variation in reported stooling prior to commencing Prucalopride and 3 out of 5 (60%) of patients reported an improvement in stooling pattern following the commencement of Prucalopride. In patients where there was an improvement in stooling frequency, all were able to deescalate other medical therapies including reductions in rectal therapies. With regards to adverse side effects: 2 (40%) patients reported pain initially on commencing treatment, 1 (20%) patient reported headache, 1 (20%) patient reported a worsening of existing bladder instability and 1 (20%) patient reported reduction of appetite and weight loss. No patient had adverse side effects that led to the cessation of treatment.

Summary:
We present our unit's experience in using Prucalopride, a novel agent for use in the management of paediatric constipation. 3 out of 5 patients receiving Prucalopride had an improvement in their stooling pattern with acceptable side effect profiles. Prucalopride should be considered in management of paediatric chronic constipation not responding to conventional medical therapy.

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(2) Constipation in children and young people: diagnosis and management Clinical guideline [CG99]Published: 26 May 2010 Last updated: 13 July 2017 NICE

(3) Prucalopride for the treatment of chronic constipation in women Technology appraisal guidance [TA211]Published: 15 December 2010 NICE

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Table 1: Summary of patients and effects of treatment.

Patient	Gender	Diagnosis	Age at diagnosis	Previous Surgical management	Age when started Prucalopride (years)	Stooling prior to treatment	Stooling after treatment
1	Female	Idiopathic constipation	Late childhood	Nil	13	Every 3 weeks	alternate days
2	Female	Idiopathic constipation	Early childhood	Nil	15	Every 3-4 days	daily
3	Female	Idiopathic constipation	Teenage years	Nil	17	Infrequent	no difference
4	Female	Idiopathic Constipation	Birth	ACE	16	3 x weekly enemas and ACE washouts	no difference
5	Female	Idiopathic constipation	Early childhood	Anal Botox, ACE	14	ACE and rectal washouts	frequent slushy stools

G12

Impact of remote prescribing consultations in tertiary care

Julie Summersby
Birmingham Women's and Children's Hospital, Steelhouse Lane, Birmingham

Introduction

COVID-19 has impacted the delivery of services provided throughout the National Health Service. Innovative ways of working remotely has been a challenge to provide safe and effective care to patients in a timely manner.

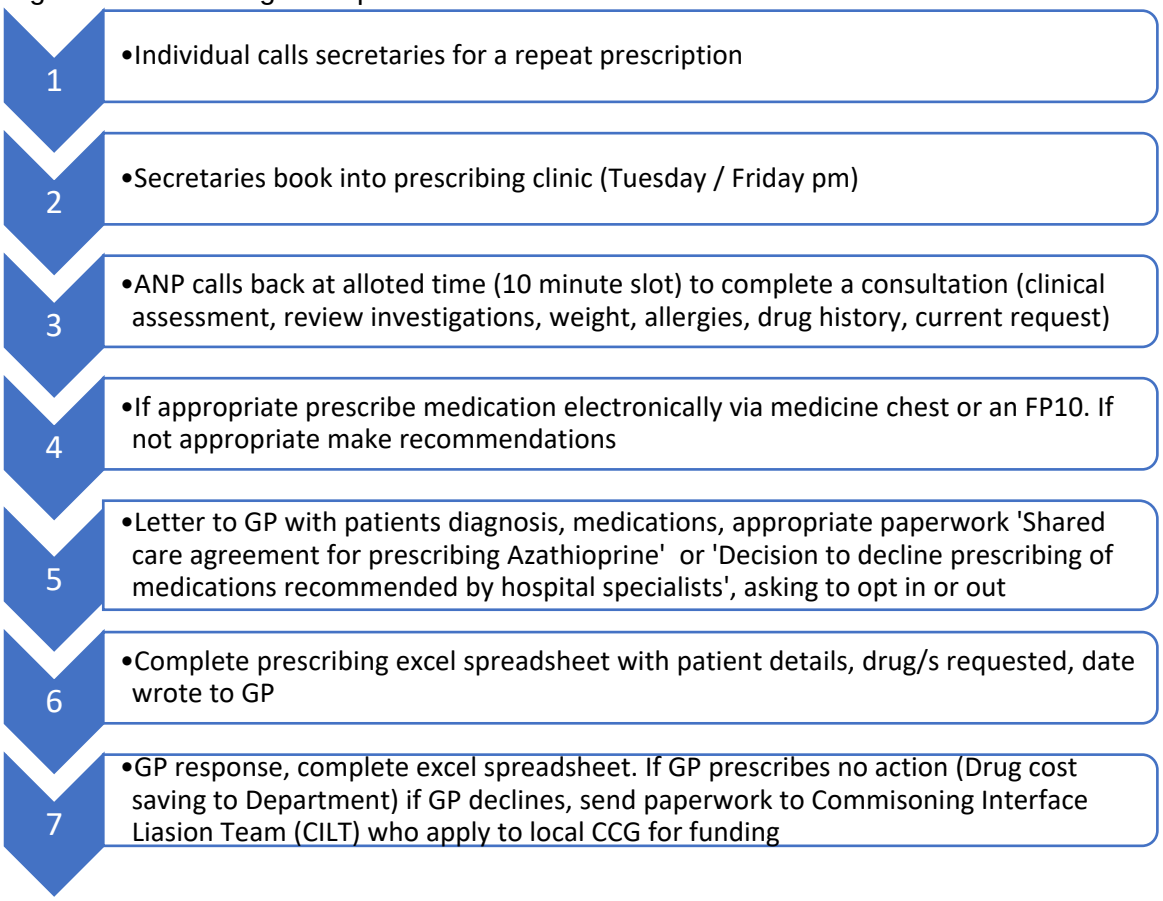
The Gastroenterology and Nutrition Team at Birmingham Children's Hospital, treat one of the largest cohorts of paediatric patients in Europe with: Inflammatory Bowel Disease, intestinal failure receiving home parental nutrition and other gastrointestinal diseases.

Many patients are on long-term medication and the pandemic increased the demand for remote prescription requests. The Advanced Nurse Practitioner recognised and developed a service improvement initiative to prescribe safely through remote consultations.

Aim
To provide a standardised approach to provide remote consultations in order to issue repeat prescriptions in a safe and effective manner. To adhere to current guidance, to promote best practice, work in partnership with GPs and to audit the findings following implementation.

Method
Searches were conducted for literature surrounding remote prescribing. Using current guidance, the ANP implemented a seven step approach in performing prescribing consultations (see Figure 1).

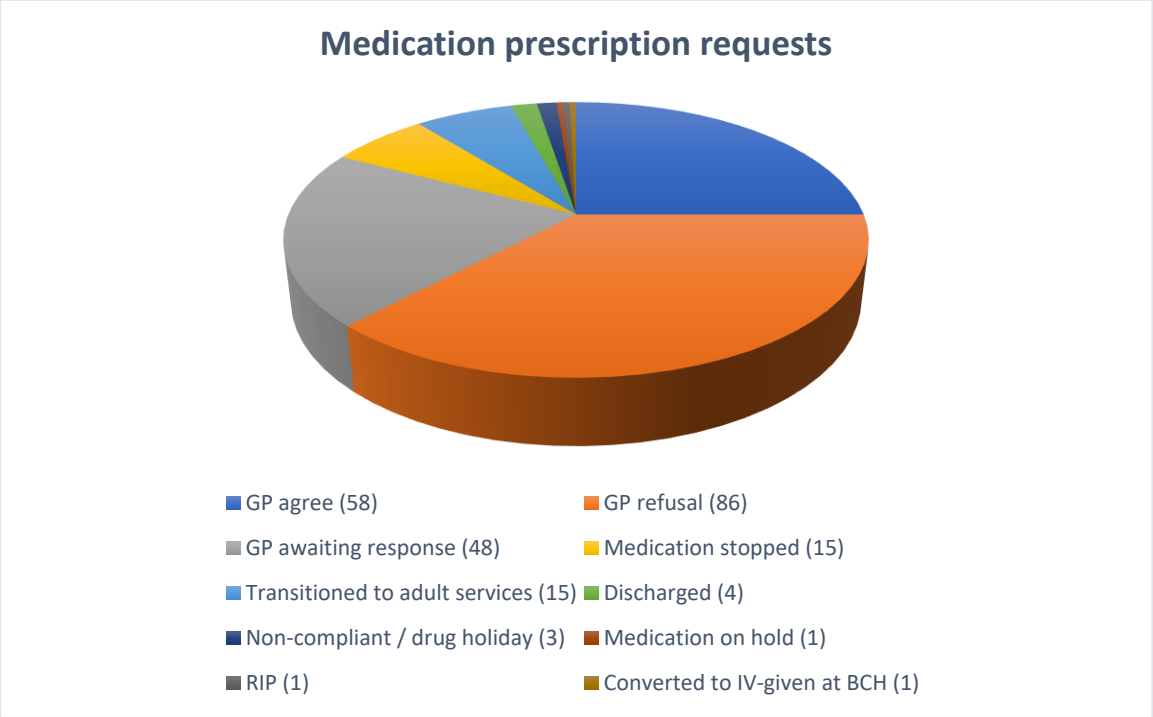
Figure 1: Prescribing clinic process

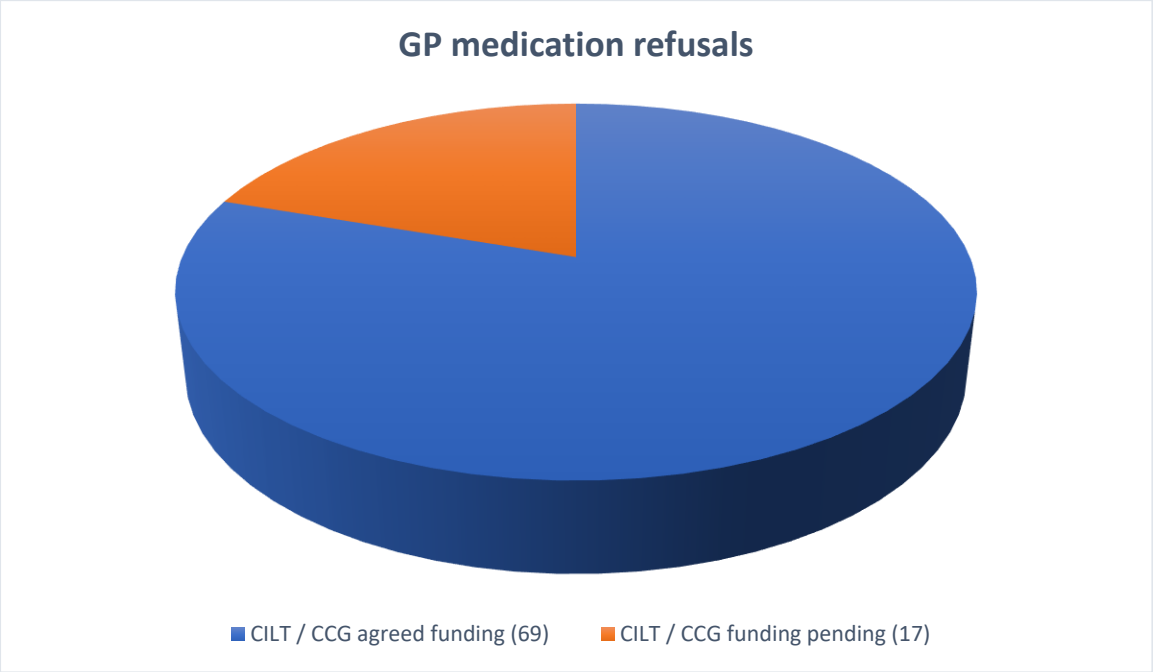


Results

232 patients requested repeat prescriptions, with a total of 435 medications. These figures are from booked clinics and any requests outside of these were not included in these findings. Figure 2 outlines the outcome from implementing stage 5 of the process (Figure 1). Combining the number of GPs who agreed to prescribe, with the agreed Clinical Commissioning Groups (CCG's) funding, amounted to 54.74%. 17 CILT funding requests are pending, therefore 60.06% of requests are likely to be funded. 40 patients (17.24%) were removed from the medication requests for a variety of reasons and 48 requests (20.68%) are pending a response.

Figure 2:





In 18 consultations, recommendations were needed to promote patient safety, for example:

- Unwell patient booked into a face to face clinic for review
- Abnormal bloods – neutropenic (Azathioprine placed on hold)
- Insufficient blood levels highlighted to consultant – increased medication dose / duration
- Missed blood monitoring – arranged
- Poor compliance – booked into Clinical Nurse Specialist clinic
- Missed clinic appointments – booked in

Summary
By recognising and applying a new way of working has improved patient safety as it allows for a planned consultation to be completed in a timely assessment by an advanced practitioner. Auditing the process has reported that remote prescribing clinics have streamlined the process, provided accountability with clear documentation and facilitates working in collaboration with colleagues, all of which promote prescribing governance. This service improvement pathway has led to reducing drug costs within the department whilst generating income to the Trust, although figures are to be finalised.

Conclusion
It appears that from implementing a remote prescribing clinic, it has allowed a timely consultation to assess the patient, review investigations, identify evidence-based treatment options, present options and reach a shared decision.

Working collaboratively with colleagues in primary care, by documenting and offering Effective Shared Care Agreements has developed patient care and reduced drug costs in the department. Many medications used in paediatrics are unlicensed. Where GPs have felt unable to prescribe in partnership with specialists, by offering paperwork to decline prescribing, has allowed the Gastroenterology Team work with the Commissioning Interface Liaison Team which has gained funding from the local CCG to cover the cost of supplying, dispensing and delivering the medication.

This model promotes excellent practice as outlined in ‘A Competency Framework for all Prescribers’ (The Royal Pharmaceutical Society, 2021).

G13

Pathophysiological findings in children with anorectal malformations: a comparison with functional constipation.

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Royal London Hospital, London

INTRODUCTION
Despite surgical reconstruction in infancy, children with anorectal malformations (ARM) commonly have physical (faecal incontinence and constipation) and psychosocial morbidity. Traditional dogma is that high ARM have more morbidity compared with low ARM. Children with ARM have poorer sphincteric function demonstrated using anorectal physiology (ARP), yet there is limited knowledge of other extra-sphincteric parameters. In the absence of normal ARP values in children, it is difficult to interpret ARP levels for any condition such as ARM, in isolation.

AIM
Our aim was to investigate the pathophysiological findings in children with ARM and compare these with children with functional constipation and faecal incontinence (FCFI).

METHODS
Patients cohorts were derived from the Children's Anorectal Physiology Service prospectively kept database over a five-year period (September 2016 – October 2021). Primary outcome measures were: (1) ARP parameters, (2) transit marker study (TMS), (3) bowel scores (St Marks and Cleveland) (4) presence of urinary incontinence and (5) psychology scores (PIED and PedQoL). Patient demographics (sex and age) and type of ARM (Krickenbeck classification) are also reported.

Outcomes for children with ARM were compared with children with FCFI using SPSS v27 software. Categorical variables are presented as proportions and continuous variables as mean with standard deviation. Statistical tests used are presented and a p value <0.05 was considered statistically significant. Patients with missing data were not included in comparative analysis.

RESULTS
The overall cohort consisted of 305 children (40 (13.1%) had ARM and 265 (86.9%) had FCFI). Of the ARM cohort, 10 (25%) had high, 14 (35%) had intermediate, 8 (20%) had low malformations, 4 (10%) had anterior anus and 1 (2.5%) had cloaca. There were no differences between ARM types across all outcomes.

The ARM and FCFI cohorts were similar with regard to sex distribution and age at time of performing ARP (Table 1). Children with ARMs have lower resting and squeeze sphincter pressures compared to children with FCFI. There were no differences in rectal sensation and dyssynergia between the two groups. Overall, there were no statistical differences in the TMS comparison, however there were proportionally more ARM patients with slow transit than FC/FI (30% cf. 18% respectively) and less ARM patients with rectal evacuatory disorder than FCFI (22% cf. 34% respectively). The severity of reported faecal incontinence (St Mark's score), proportion with urinary incontinence and psychological scores were not different between the two groups, however children with FCFI have higher Cleveland scores.

SUMMARY & CONCLUSIONS

The aetiology of symptoms in children with constipation and faecal incontinence is complex and multifactorial (Figure 1). The measured outcomes do not differ by ARM subtype. There

are physiological differences in children with ARM and FCFI, but symptoms are similar. We suggest that multimodal management for ARM and FCFI should be similar. Normal physiological and motility results usefully direct management to reducing existing treatment or to focusing on behavioural intervention.

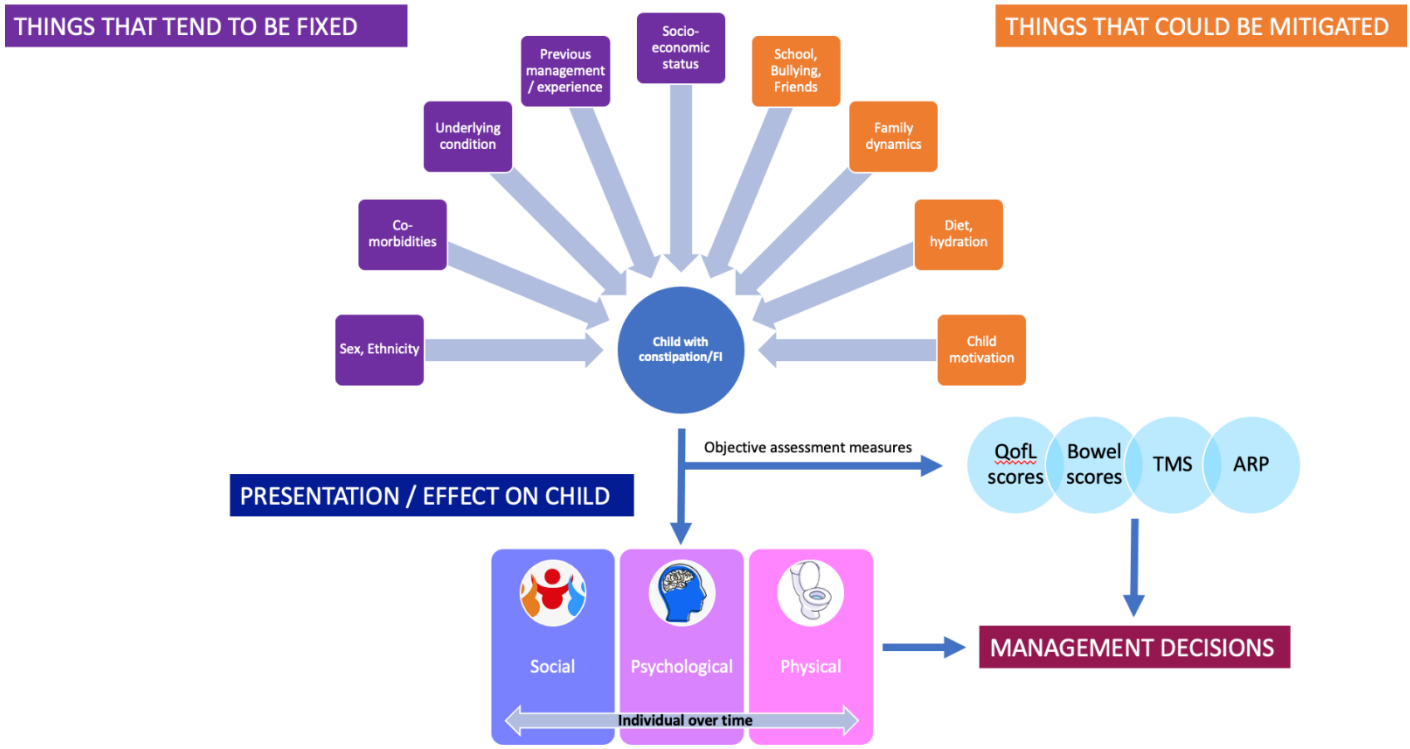


Figure 1: The complex and multifactorial nature of constipation and faecal incontinence in children

G14

Is Lockdown Good For Constipation?

Gordon, K
Oxford University Hospitals NHS Trust

Background
Children's routines have been disturbed during the last 2 years due to national lockdowns with school closures. It is acknowledged that daily routine is important for a healthy bowel habit and we therefore had concerns that this may have a detrimental effect on children with constipation.

Aim of Study

To examine the effects of lockdown due to COVID19 on children's symptoms of constipation.

Method
Prospective data was obtained by questionnaires, which were handed to 50 children and parents attending a childhood constipation clinic in the normal way following the easing of lockdown. The questionnaires asked about symptoms that would normally be asked in the clinic appointments. Parents were asked if the child's symptoms had become worse, improved or stayed the same and asked respondents to give reasons for their answers. The questionnaires were then collated and common themes noted. Ethics approval was not required.

Results
38% of parents reported improvement in symptoms

34% of parents reported deterioration in symptoms

28% of reported no change in symptoms.

The reasons given for improvements in symptoms included an increase in the ability of parents to monitor children's fluid intake and toileting routines at home, easier access to toilets and less with holding behaviour, usually adopted to avoid using school toilets. These children were also reported as being generally more relaxed and happier to be at home. Of note in this group were reports that symptoms often deteriorated on returning to school.

The reasons given for a deterioration in symptoms included a lack of physical activity, lack of routine in toileting and taking medication, and changes in diet. This group also commonly included reports of children and parents experiencing anxiety, isolation, anger and lack of motivation. The most common symptom to be reported as problematic was children either beginning to soil or their soiling becoming more frequent.

Most who gave reasons in the group reporting no change did recognise some of the above observations and in some cases positive aspects such as easier access to toilets were counterbalanced by lack of exercise.

Summary
Many reasons for changes in symptoms of childhood constipation during the national lockdowns were reported. There was a balance, with almost equal numbers, reporting improvements and a worsening of symptoms. Others did not notice any change in their child's condition. Physical, behavioural and emotional reasons were cited as being responsible for changes in children's experience of constipation.

Conclusion

Lockdown due to COVID19 has had a varied effect on symptoms of constipation in children. The assumption that children's constipation would become worse has been challenged in that slightly more children improved during this time with some then deteriorating again when lockdown was eased. These results re-iterate the need to tailor approaches to treatments and care of children with constipation on an individual basis. It is also important to equally understand the anxieties of being in school for some but the effects of social isolation and uncertainty for others.

G14

The use of pyloric EndoFLIP to assess response to Botulinum Toxin injection in Children

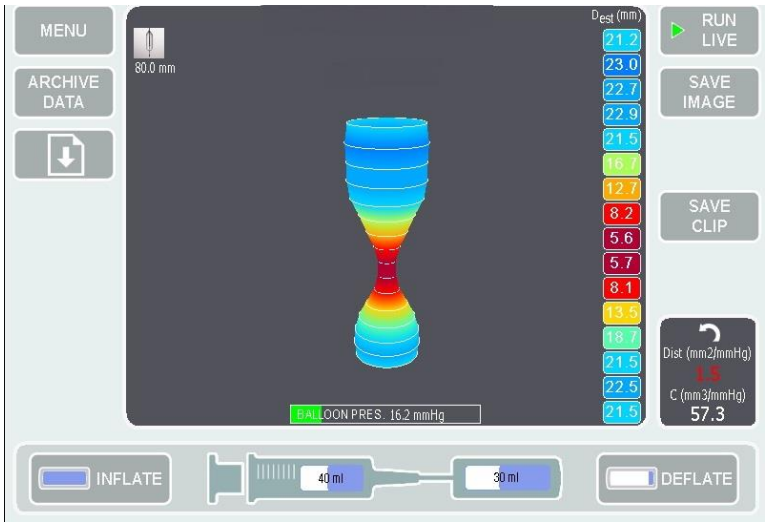
Mara Popescu[1], Jochen Kammermeier[2], Rakesh Vora[2] and Mohamed Mutalib[2]
[1]King's College London; [2]Evelina London Children's Hospital

Background: Gastrointestinal complaints are common in children with neurodisabilities, vomiting, retching and poor feed tolerance are frequently reported. EndoFLIP is used to assess compliance and distensibility of the pylorus and can predict response to Botulinum Toxin in adult with gastroparesis. We aimed to review pyloric muscle measurements using EndoFLIP via existing gastrostomy stoma in children with neuromuscular disabilities and significant foregut symptoms and assess response to intrapyloric Botulinum Toxin by using modified Gastroparesis Cardinal Symptom Index (GCSI).

Methods: Retrospective review of clinical notes of all children who underwent pyloric EndoFLIP assessment in Evelina London Children Hospital from March 2019 to June 2021. EndoFLIP catheter was inserted at the time of endoscopy via existing gastrostomy tract.

Results: Eighteen measurement in 10 children were obtained, mean age 10.7 ± (4.2) years. Measurements (pre and post Botox) were obtained with 20, 30 and 40mls balloon volume. Diameter (6.4, 6.6), (8.1, 8.4) and (10.6, 9.9), compliance (99.8, 137.5), (88.5, 143.7) and (107.1, 96.1) mm3/mmHg, distensibility (2.9, 3.5), (3.2, 3.2) and (3.0, 3.1) mm2/mmHg and balloon pressure was (13.4, 10.8), (18.7, 9) and (10.6, 9.9) mmHg. 8 children improved clinically as measured by GCSI and EndoFLIP measurements after Botulinum Toxin injection.

Conclusions: In children with neurodisabilities who present with symptoms suggestive of poor gastric emptying do have a low pyloric distensibility and poor compliance. EndoFLIP via existing gastrostomy tube is quick and easy to perform. Intrapyloric Botulinum Toxin appear to be safe and effective in this cohort of children leading to clinical and measurements improvement.



G15

Irreversible blindness in two children with autism spectrum disorder

Melanie Dean[1], Lakshmi Selvarajan[2], Daphin Fernandez[3], Peta Sharples[3], Denize Atan[4] and Christine Spray[2].
[1]University Hospitals Bristol and Weston NHS FT; [2]University Hospitals Bristol and Weston NHS FT, Dept of Gastroenterology; [3]University Hospitals Bristol and Weston NHS FT, Dept Of Neurology; [4]University Hospitals Bristol and Weston HS FT; Dept of Neuro-Opthalmology;

Introduction/Background
Atypical feeding behaviours and eating restrictions are prevalent in up to 89% of children with autism spectrum disorder (ASD). Known as avoidant/restrictive food intake disorder (ARFID), children with ASD often limit their intake to specific textures, colours and appearance. This results in a highly limited diet which can lead to significant nutritional deficiencies as highlighted by NICE in their 2021 update for ASD management.

Vitamin A, an essential micronutrient, is required for the maintenance of vision (particularly in low light), integrity and function of all mucosal and epithelial tissue, growth and development and a promotional and regulatory role within the immune system. It can only be sourced within our food, derived from fruit, vegetables and animal sources which are often lacking in the diet of those with ASD. Deficiency of vitamin A can have life altering consequences. Ocular symptoms, known as xerophthalmia, span conditions such as night blindness, conjunctival xerosis and bitot's spots are characteristic of vitamin A deficiency, to in its most severe form, rare and irreversible blindness as a result of corneal ulceration, scarring and necrosis.

Aim
Through the presentation of two paediatric case studies, IM a 13 y/o female and KB an 11y/o male, we aim to highlight the risk of vitamin A deficiency in children with autism leading to irreversible loss of sight.

Subjects and methods
A retrospective review of the case notes was undertaken for IM and KB. Both children had autism and were diagnosed with irreversible visual changes secondary to severe vitamin A deficiency. Their journey from clinical presentation to diagnosis and management of their vitamin A deficiency is explored. Pervasive challenges and pertinent aspects are drawn out to raise awareness and aid future practice.

Results
Both children had severely restricted diets containing no fruit or vegetables, consisting mainly of processed carbohydrates despite parents best efforts. IM presented to hospital following a collapse at home and was retrospectively found to have a 6-8 week history of deterioration in vision with a vitamin A level of 0.2 (normal range 0.8 – 2.2). KB had a rapid deterioration in vision and presented due to a change in behaviour. His vitamin A level was <0.1 and was attributed to dietary restriction. Both children found any hospital visit, particularly examination and investigations, highly distressing which created difficult barriers for their parents seeking medical attention.

Summary
The nutritional challenges in children with ASD and ARFID are widely acknowledged. So too are the practical difficulties in monitoring and investigation for potential deficiencies in these patients. Nevertheless, the life altering implication of irreversible blindness caused by severe vitamin A deficiency warrants greater consideration in children with autism and hopefully preventable in future.

Conclusion

All children with restricted diets and autism, even if not formally diagnosed, should undergo nutritional assessment in the community and those considered at risk warrant nutritional bloods for early diagnosis and timely intervention.

G16

A Single Centre Experience of Adopting the EPSGHAN 2020 Coeliac Guidelines

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Background: In 2020 ESPGHAN updated guidelines for the evaluation of suspected coeliac disease. Significant changes to diagnostic pathways have been recommended. The aim of this study is to audit how these recommendations have been implemented in a large tertiary children's hospital, as part of a service evaluation optimising coeliac diagnostic pathways.

Methods: Children between September 2020 and August 2021 who underwent evaluation and diagnosed with coeliac disease were retrospectively identified. Their indication for evaluation (such as symptom profile, high risk co-morbidities and family history), serology and genetic testing and subsequent biopsy or non-biopsy pathways were reviewed against ESPGHAN guidelines.

Results: 24 children (8 male, 16 female) with an average age 8 years (range 2-16) were identified with an elevated (>6.9 U/ml) IgA tissue transglutaminase antibody (IgA TTG). Endomysial antibody testing (EMA) was sent in 11/24. Patients were screened for co-existing IgA deficiency. 5/24 underwent HLA testing. The median IgA TTG in this cohort was 21.2U/ml, with 7 having a IgA TTG ≥ 10 times the upper limit of normal. Those with an IgA TTG level that allowed a non-biopsy pathway, 2 children underwent endoscopic assessment. Those children with a IgA TTG <10 times the upper limit of normal, the biopsy pathway for assessment was recommended. 3 children has deferred endoscopic assessment, as families had opted for a gluten free diet prior to endoscopy.

All children who underwent the biopsy-pathway, during endoscopy had at ≥4 biopsies from the D2/D3 duodenum and ≥1 from the duodenal bulb, as per the guideline recommendations

Conclusions: The non-biopsy pathway for the assessment and diagnosis of Coeliac disease has been successfully adopted, with (71%) of those appropriate for this approach, avoiding the need for endoscopy. Challenges in adopting these pathways were seen with clear documentation around shared decision making about choice of pathway, families adopting a gluten free diet prior to formal diagnosis and ongoing HLA testing for those with elevated IgA TTG at assessment.

G17

Eosinophilic oesophagitis in children: A single UK tertiary centre experience

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Maidstone and Tunbridge Wells Hospital

The incidence of Eosinophilic Oesophagitis (EoE) is increasing worldwide in the paediatric population. Management of these children is complex, and includes elimination diet (2/4/6 food), steroids etc. It is recommended to perform endoscopies between each reintroduction to assess disease activity. In our centre dietary exclusion is the standard practice. Since 2019 we follow a step-up approach with regards to elimination diet starting with 2 food exclusion diet (FED) and building up as required. Food is reintroduced gradually with significant dietetic support and proactive monitoring including endoscopy.

Objectives:
We looked at the outcomes of children with EoE referred to Maidstone and Tunbridge Wells NHS Trust from Kent and East Sussex.

Methods:
Retrospective review of case notes of paediatric patients diagnosed with EoE between January 2015 and December 2020. Data collected included symptoms, endoscopy findings and histology at diagnosis and compared the same after dietary intervention.

Results
21 patients were diagnosed with EoE between January 2015 and December 2020 between 5-16 yrs Median age at diagnosis 11years. Frequently seen in boys (65%). Dysphagia was the predominant symptom (76%) followed by vomiting (60%), abdominal pain (50%), and choking (20%). Features of EoE were seen during endoscopy in 71% and oesophagus looked endoscopically normal in 29% of patients. Diagnosis was made on eosinophil count as per ESPGHAN guidance. The frequency and timing of repeat endoscopies following dietary intervention varied due to a multitude of factors including COVID-19 restrictions (between 4-9 months median 4 months). Histological remission (Eosinophils <15 pHPF) was achieved in 15/21 (70%) of patients. 7/10 children on 2FED, 3/3 patients on 4FED and 5/5 children on 6FED achieved histological resolution. The 6FED group took significantly longer to identify the causative food, establish long term dietary management and required more endoscopies. Food was reintroduced gradually on an individual basis with the aim of introducing back all food groups. 13/15 continue to be on milk free diet, 5/15 remain on milk and wheat free diet, 1/15 on soya and egg free diet and the other patient remains on 4FED (parental choice). 2 patients have started steroids due to on-going symptoms findings on surveillance endoscopy and histological following re-introduction.

Summary and Conclusion

Dysphagia was the predominant symptom in our cohort of patients. Furrowing and oedema was the major finding during endoscopy. With dietary exclusion endoscopic resolution was seen in 62% and histological resolution seen in 70% of patients at first surveillance endoscopy. Re-introduction continues to remains a major challenge and we have not been able to introduce all the food groups in any of our patients due to either symptoms or recurrence on endoscopy/histology.

G18

An Unusual Presentation of Megacystis-Microcolon-Intestinal-Hypoperistalsis Syndrome.

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Sheffield Children's Hosptial

Case

A 13 month old girl, with background of congenital megacystis requiring intermittent catheterisation, right duplex kidney and constipation presented to A+E with a short history of lethargy, vomiting and fever. She appeared lethargic and pale with a slightly distended abdomen.

Initially a diagnosis of gastroenteritis was entertained but she quickly deteriorated with tachycardia and hypotension, and was transferred to intensive care. She went on to develop decompensated shock with multi-organ failure including AKI stage 3, transaminitis, coagulopathy with leukoencephalopathy on MRI. She was intubated and ventilated, received significant fluid resuscitation, intravenous antibiotics, inotropes and required haemofiltration. Blood and urine cultures were negative. She developed bloody diarrhoea and an abdominal x-ray showed a dilated colon with bowel wall thickening, without features of obstruction. She improved slowly with a period of bowel rest, parenteral nutrition and neuro-rehabilitation.

As a neonate she had been admitted to intensive care for bilious vomiting and delayed passage of meconium. She was described to have been managed for constipation from birth requiring laxatives.

Attempts to establish feeds induced bloody diarrhoea and pyrexia. Contrast enema showed a distended featureless loop of sigmoid colon with tortuous proximal descending colon. This was felt not to be typical of megacystis microcolon as the areas of colonic narrowing were segmental. A Barium enema showed segmental microcolon. Endoscopic assessment revealed an enterocolitis. Histology showed severe inflammation with granulation tissue in the descending colon and Ganglion cells were identified in the submucosa. Rectal strip biopsies were normal and adequately ganglionated. Genetics were sent for exome sequencing and identified a de novo heterozygous pathogenic ACTG2 missense variant, 275, a known pathogenic mutation. A diagnosis was made of probable Megacystis-Microcolon-Intestinal-Hypoperistalsis Syndrome (MMIHS).

Discussion
MMIHS is a rare syndrome consisting of a dilated bladder without obstruction, a microcolon and intestinal dysmotility. The condition was first described by Walter Berdon in 1976 and a recent systematic review in 2011 identified 227 reported cases between 1976 and 2011. The condition is often suspected antenatally with megacystis being found on ultrasound. Neonatally these children present with symptoms of bladder and bowel obstruction including distended abdomen, inability to void, delayed passage of meconium and bilious vomiting. The prognosis is variable with intestinal dysfunction leading to dependence on parenteral nutrition. Defunctioning of the colon is reported in most affected individuals, or they go on to require multivisceral transplantation for survival and PN autonomy.
ACTG2 mutation has been identified in 44.1% of cases of MMIHS making it the commonest known genetic cause of MMIHS. ACTG2 affects actin γ 2 smooth muscle and can present with varying degrees of visceral myopathy including MMIHS and chronic intestinal pseudo-obstruction.

Conclusion

This was an unusual presentation in an older infant with symptoms suggestive of a Hirschprungs-like enterocolitis leading to a diagnosis of MMIHS with identification of de novo ACTG2 missense variant associated with the condition. This case highlights the importance of taking a neonatal history and the diagnostic power of whole exome sequencing in children with congenital GI disorders.

G19

An unusual cause of paediatric gastric outlet obstruction

Zoë Wands[1], Bhanumathi Lakshminarayanan[1] and Elena Cernat[1]
[1]Paediatric Gastroenterology Dept; Leeds Teaching Hospitals, NHS Trust, Leeds; [2]Paediatric Surgery Dept, Leeds Teaching Hospitals, NHS Trust, Leeds

Introduction: Gastric outlet obstruction (GOO) is a common entity in infancy, caused primarily by idiopathic hypertrophic pyloric stenosis. In the paediatric/adolescent population GOO is rare, however the exact figures are unknown. While H. pylori is well documented as a cause of GOO in the adult population, only two paediatric cases have been published in the literature to date.

Aim: The aim of this case report is to raise awareness that insufficiently treated peptic ulcer disease secondary to H. pylori can lead to GOO in paediatric patients.

Subject and methods: We present the case of a 13-year-old girl who attended A&E with a 12-hour history of sudden onset and progressive upper abdominal pain associated with severe nausea and vomiting. On examination she had a rigid, distended abdomen, generalised tenderness and guarding in the epigastric region.

She had recently moved to the UK from Nigeria, where she had been diagnosed with peptic ulcer disease secondary to H. pylori infection following a three year history of extreme weight loss, reduced oral intake and post-prandial vomiting. She underwent a series of psychological interventions due to concerns she was suffering from an eating disorder, until she tested positive for H. pylori in June 2021. She was prescribed a two-week course of omeprazole and an unknown antibiotic, which she completed. Following this treatment her symptoms resolved and she started to regain weight, however she experienced gradually increasing abdominal distension in the months leading up to her presentation to A&E.

Results: An abdominal X-ray in A&E showed possible bowel obstruction. This was followed by a contrast study which illustrated almost complete GOO. On upper GI endoscopy the stomach was found to be very dilated with inflamed erythematous mucosa, and the pylorus was almost completely obstructed by a very hypertrophied, friable mucosa. Attempts to cannulate the pylorus were unsuccessful. The CLO test was positive. The diagnosis made was of GOO secondary to H. pylori peptic ulcer disease.

The patient was kept nil-by-mouth, receiving parental nutrition (PN) via PICC line and was prescribed triple therapy for H. pylori eradication.

A repeated barium study nine days after the first showed some improvement, with the stomach emptying small amounts of contrast. A repeated endoscopy revealed a small opening through the pylorus and the endoscope was passed into duodenum, which had a normal appearance. Unfortunately a guided wire NJ placement was unsuccessful and she continues to receive PN with minimal oral fluids.

Summary: The case study describes one of the very few paediatric cases of GOO secondary to H. pylori infection.

Conclusion: Although rare, GOO should be included in the differential diagnosis of older children with non-bilious vomiting and failure to thrive. Radiological tests are important tools in the diagnosis but, in the case of H. pylori infection, endoscopy and CLO testing are essential as can lead to medical treatment and resolution of symptoms without the need for surgical intervention.

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G20

A Case Report of a Primary Small Bowel Malignancy in Paediatrics.

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Background
A 13-year-old boy was referred urgently to our gastroenterology clinic by his GP with a history of 8 weeks cramping abdominal pain, alternating diarrhoea and constipation, intermittent vomiting and a 5Kg weight loss. A brief inpatient admission resulting in commencing Movicol for constipation had no effect. An ultrasound done by the GP showed grossly inflamed bowel and was suggestive of Crohn's disease. All bloods were normal, but the faecal calprotectin was marginally raised at 98mg/g. When he was seen in our outpatient clinic a mass was felt in the right iliac fossa. Endoscopy was arranged the following day and revealed an ulcerated, hard, voluminous mass in the caecum causing obstruction of the bowel lumen. The rest of the colonoscopy and upper GI endoscopy were macroscopically normal.

MRI demonstrated a large exophytic annular mass involving the terminal ileum and extending approximately 18cm. This was strongly suggestive of lymphoma. There were no other lesions identified on MRI. Initial histology from endoscopic biopsies showed granulation tissue reaction, diffuse neovascularisation with acute and chronic inflammatory cells. There was no evidence of dysplasia, adenocarcinoma or lymphoma. Fortunately, the mass could be entirely resected via surgery. Histology confirmed the suspicion of Non-Hodgkin's Lymphoma in the terminal ileum.

Discussion
Small bowel cancer is extremely rare in children, and it is estimated that primary gastrointestinal malignancy accounts for less than 5% of all paediatric tumours, with one study suggesting as low as 1.2%. Malignancies include lymphoma (54-74%), carcinoid (3.4-16%), carcinoma (5.5-10%) and sarcoma (3.6%). Benign differentials include inflammatory masses, polyps, haemangiomas and neurofibromas. Non-Hodgkin's lymphoma is the commonest small bowel malignancy found in children with a high percentage of Burkitt's lymphoma. Lymphomas are most frequently found in the terminal ileum and ileocaecal area in children. Presentation varies from palpable abdominal masses, symptoms of obstruction or abdominal pain from perforation. Treatment is a combination of surgery, chemotherapy and radiotherapy. Complete resection, as it was fortunately possible for our patient, improves the outcome significantly.

Conclusion
Small bowel malignancy is a rare but critical diagnosis in children. Presentation can be insidious and can easily be mistaken as functional in nature or as a symptom of possible inflammatory bowel disease. A history of weight loss, as in this case, is vital and should promote early investigation with endoscopy. Early detection and intervention with surgery improves survival and therefore, although rare, malignancy should remain on the clinician's differential diagnosis list until excluded.

G21

Overlapping Clinical Profiles When Juvenile Dermatomyositis Presents With Coeliac Disease

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University Hospital of Southampton NHS FT

Introduction/Background: Co-existing immune-mediated conditions including juvenile dermatomyositis (JDM) are well described in coeliac disease. Both conditions can present with overlapping features including dermatological, neuromuscular, nutritional and other manifestations, thereby posing diagnostic challenges necessitating multi-specialty involvement. JDM can present with a variety of non-specific cutaneous manifestations in addition to the pathognomonic Gottron's papules and heliotrope rash. Likewise, coeliac disease may present with a wide variety of non-specific skin rashes, with approximately 10-15% of patients with the classical dermatitis herpetiformis.

Aim: We present a rare case of a three-year old female, with concomitant juvenile dermatomyositis (JDM) and coeliac disease, both conditions diagnosed closely together, presenting with a constellation of overlapping clinical manifestations.

Subject and methods: A three-year old girl presented acutely to the Rheumatology clinic with a two-month history of progressive muscle weakness, joint pains, skin rashes and a history of constipation. She was admitted to the paediatric ward for the diagnostic workup and management of severe JDM
.
Results: The patient's symptoms included profound proximal muscle weakness in her neck and upper and lower limbs, a weak voice, unstable gait, arthralgia, myalgia and widespread skin rashes. Two months preceding her illness, she had developed ulcers in her mouth thought to be secondary to hand, foot and mouth disease. On examination, she had ulcerative skin lesions, periorbital oedema, Gottron's papules on her knuckles and elbows, periungual erythema, livedo on her thighs and a maculopapular rash on her chest. Her muscle enzymes were significantly raised and she had a low creatinine. MRI of both thighs showed moderate-severe inflammation of the muscular, subcutaneous and fascial compartments. During her admission, she was noted to have significant abdominal distension with distended bowel loops on abdominal imaging. Tissue transglutaminase was elevated (> 250, normal 0-15) with a positive endomysial antibody. MRI of the abdomen did not show evidence of colitis but coincidental findings of a horseshoe kidney and a 18mm lympho-vascular lesion in the liver. With her complex presentation, a whole exome/targeted sequencing has been considered in addition to myositis specific antibody studies. Alongside her immunosuppressive treatment for JDM, the patient is now making good progress on a gluten-free diet.

Summary and conclusions: The key points of consideration in this case are: 1) The awareness of co-existing immune-mediated gastrointestinal enteropathies in patients with JDM; 2) It is often difficult to map out the contribution of either condition to the overall symptom profile; 3) Paediatricians need to be aware that coeliac disease may co-exist with JDM and unless it is looked for early there may be diagnostic delay due to overlapping signs; 4) While clusters of autoimmune conditions have been reported in published literature, non-conventional investigations such as whole exome sequencing can be considered for a precise molecular diagnosis which may support clinical decisions and improve patient outcomes; 5) With the emergence of robust high throughput technologies, genomic profiling of patients presenting with rare concurrent autoimmune conditions may be useful to identify candidate genes causing overlapping syndromes, inform prognostication and tailored therapeutic approaches in the future.

Figure 1: Maculopapular Rash on Trunk

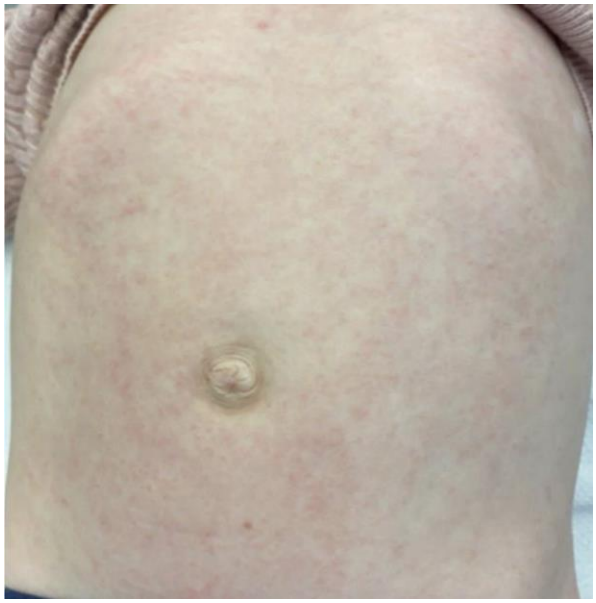
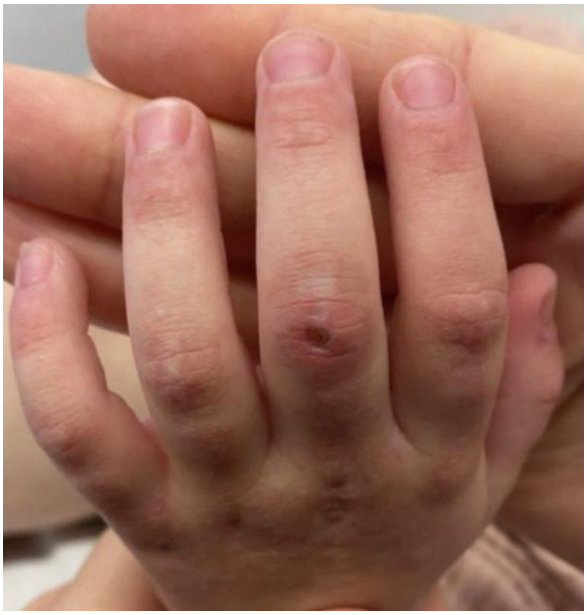


Figure 2: Gottron's Papules on Left Hand



G22

Duodenal stricture as a rare, possible complication of Eosinophilic Gastrointestinal Disease (EGID)

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EGID is a recently described condition with an unknown etiology and pathogenesis. There are three case reports of duodenal stricture associated with EGID: one in an adult requiring pancreaticoduodenectomy due to the suspicion of malignancy and 2 cases in a child and a young adult, who responded to oral steroids.

We report the case of a 10-year-old who presented to A&E with a 9-month history of epigastric abdominal pain and 1 episode of haematemesis, on a background of asthma. He was treated for Helicobacter pylori, based on a positive stool antigen. Abdominal pain and vomiting persisted, therefore an oesophago-gastro-duodenoscopy (OGD) was performed. This identified widespread white plaques throughout the oesophagus, erythema and nodularity of the gastric antrum and white nodules in the first part of the duodenum. Histology revealed changes of EGID and eosinophilic oesophagitis (EOE) and patient was commenced on Montelukast, oral viscous Budesonide (OVB), Cetirizine and continued proton pump inhibitor (PPI). After the allergy workup identified house dust mites, cat sensitisation and fish allergy, a 6-food elimination diet was initiated.

During the next 2 years, symptoms subsided, and endoscopy changes improved, with only mild signs of active EOE while on OVB, PPI and diary/egg/fish free diet. However, the patient relapsed due to poor compliance to treatment. He became more unwell during the Covid pandemic with recurrent vomiting and static weight. A trial of dupilumab was considered, however his reassessment OGD had to be delayed due to restricted access to theatre. He was treated empirically with a reducing course of oral prednisolone, with temporary response. The endoscopic assessment performed subsequently showed erythema, erosions and white plaques in the distal oesophagus and gastric antrum with narrowing between the first and the second part of the duodenum (D2), that could not be entered. Histology identified mild upper oesophagitis (4 eosinophils(eos)/HPF), active middle and lower oesophagitis (20 eos/HPF and 12 eos/HPF, respectively), chronic gastritis (80 eos/HPF) and nonspecific reactive changes of the proximal duodenum. A barium meal confirmed a duodenal stricture.
At this stage, we recommended a sloppy diet and a second weaning course of oral prednisolone, along with Montelukast. He was subsequently commenced on azathioprine for maintenance of remission. A repeat barium study and small bowel MRI performed post course of steroids and on azathioprine revealed stable appearances of the proximal duodenal stricture, excluding the presence of further strictures. While the patient has responded to the course of oral steroids and azathioprine, a repeat upper GI endoscopy is currently planned to dilate the duodenal stricture.

The challenges posed by this case were the rarity of the condition, limited treatment options and access to endoscopy during the Covid pandemic and the fact that unlike previous case reports a sustained remission could not be obtained on steroids, and a maintenance immunosuppressive medication was required. We can conclude that this subgroup of patients should be monitored closely for signs of bowel obstruction and will require more intense treatment, including immunomodulators, endoscopic dilatation and or surgery.

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G23

Gastro-oesophageal Reflux and Neuro-Disability in CHILDren: (GRaNDCHILD): Modification of the P-GSQ for use in children with neuro-disability.

Sarah Mills, Catherine Tuffrey, Lee Tbaily and Mark Tighe.

Introduction: Gastro-oesophageal reflux disease (GORD) is a common condition affecting children; characterised by the passage of gastric contents into the oesophagus. This can cause pain, vomiting and regurgitation. Children with cerebral palsy (CP) are predisposed to more severe GORD due to co-existing gut dysmotility and exclusive/supplementary liquid diet. The incidence of CP is approximately 2:1000 live births and over 50% are estimated to have GORD. For children without CP, the 'Paediatric Gastro-oesophageal Reflux Disease Symptom and Quality of Life Questionnaire' (P-GSQ) helps to assess symptoms and response to treatment, but some of these questions are not suitable for children who have cognitive impairment. There are currently no suitable existing clinical tools or outcome measures that can be used to assess the severity of GORD in children with CP and cognitive impairment.

Aims: The study aimed to adapt the pre-existing P-GSQ [(1)] to enable use in evaluating children with CP and GORD. This will allow responses to treatment to be measured and support clinical trials evaluating treatment efficacy.

Methods: Cognitive interviews were conducted with parents/carers of children (aged 2-16) with CP (GMFCS level III-V) who have current or past symptoms of reflux. This included those receiving naso-gastric or gastrostomy feeds. The first phase focused on development of the questionnaire with 6 parents/primary carers by asking them to interpret the questionnaire using a 'think-aloud technique,' and offer suggestions on alterations to questions.

Results: The 6 children whose parents/carers were interviewed ranged between the ages of 3-15 and were all GMFCS V. Questionnaires were carried out by research staff trained in cognitive interview methods. The questionnaire was modified after each interview via an iterative process (Figure 1). Parents/carers reported that it was an acceptable expectation to recall the information about their child over the past 7 days. They felt the questions in the modified P-GSQ related to symptoms that they look out for in their children. There were no questions that made them feel uncomfortable and it was easy to read and understand. Reasons for changing questions included; confusing questions, differing interpretation of questions and responses not applying to their child. Some felt it was difficult to comment on questions surrounding school as they were not with their child during the school day; however, they felt it would be useful for school staff to answer these questions. Suggestions also included a section specifically for home carers.

Summary/Conclusions: We have adapted the P-GSQ to improve face validity for children with symptoms of GORD and neuro-disability. This will aid in assessing pharmacological treatments for GORD in children with cerebral palsy[(2)]. Phase two will involve further assessment including test-retest reliability of the finalised questionnaire with 20 parents/carers of children with CP and GORD.

1) Kleinman, Nelson, Kothari-Talwar, Roberts, Orenstein, Mody, Hassall, Gold, Revicki, Dabbous, Development and Psychometric Evaluation of 2 Age-stratified Versions of the Pediatric GERD Symptom and QOL Questionnaires: JPGN 2011;52: 514–522
2) NICE. GORD: recognition, diagnosis and management in children and young people. Research Recommendations (Clinical Guideline 193) 2015. www.nice.org.uk/guidance/NG1

Pediatric Gastroesophageal Symptom and Quality of Life Questionnaire

Everyday Life Impact

Please Read:

This first set of questions asks about HOW OFTEN your child has had different symptoms in the past 7 days. Remember, there are no right or wrong answers. Please choose the answer that you think is best. Mark an "X" in only one box for each question.

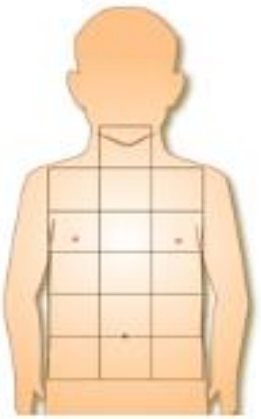
1. On how many days in the past 7 days did your child have any of the symptoms listed below? Answer based on what your child told you and what you observed.

Based on what your child told you and what you observed… On how many days in the past 7 days, did your child…	None (0 days)	1 or 2 days	3 or 4 days	5 or 6 days	Everyday (7 days)
a) have pain, ache or burning in the stomach above the belly button	☐	☐	☐	☐	☐
b) have pain, ache, or burning in the chest	☐	☐	☐	☐	☐
c) have a sore throat or burning in the throat	☐	☐	☐	☐	☐
d) throw up	☐	☐	☐	☐	☐
e) feel sick to his/her stomach or nauseated like he/she might throw up	☐	☐	☐	☐	☐
f) swallow throw up	☐	☐	☐	☐	☐
g) taste throw up in his/her mouth	☐	☐	☐	☐	☐
h) have bad breath	☐	☐	☐	☐	☐
i) burp a lot	☐	☐	☐	☐	☐
j) cough a lot for no reason	☐	☐	☐	☐	☐
k) hiccup a lot	☐	☐	☐	☐	☐
l) have trouble breathing or wheezing	☐	☐	☐	☐	☐
m) have a scratchy voice (hoarse voice)	☐	☐	☐	☐	☐
n) clear his/her throat a lot	☐	☐	☐	☐	☐
o) not feel like eating	☐	☐	☐	☐	☐
p) have trouble falling asleep because of any of the problems listed above	☐	☐	☐	☐	☐
q) wake up during the night because of any of the problems listed above	☐	☐	☐	☐	☐

2. Place an "X" in all of the squares where your child had pain, ache, hurting or burning in the past 7 days.

You can put an "X" in more than 1 square.

If your child did not experience any pain, ache, hurting or burning in the past 7 days, please put an "X" in this box: ☐



Everyday Life Impact

Now we have a few questions for you about how your child's symptoms may have affected his/her **EVERYDAY LIFE**. There are no right or wrong answers. Please choose the answer that you think is best. Mark an "X" in only one box for each statement.

3. Please read each statement below and tell us how often your child felt this way in the past 7 days.

In the past 7 days, how often has your child…	Never	Almost Never	Sometimes	Almost Always	Always
a) **felt like not doing anything** because of stomach/chest/throat problems	☐	☐	☐	☐	☐
b) **missed out on doing things with friends**, like play dates or birthday parties, because of stomach/chest/throat problems	☐	☐	☐	☐	☐
c) **been unable to do physical activities that he/she wanted to do**, like play a sport, ride a bike, skate, play at the playground or park, or swim because of stomach/chest/throat problems	☐	☐	☐	☐	☐
d) had to **lay down** because of stomach/chest/throat problems	☐	☐	☐	☐	☐
e) **been unable to eat what he/she wanted** because of stomach/chest/throat problems	☐	☐	☐	☐	☐
f) been unable to **drink what he/she wanted** because of stomach/chest/throat problems	☐	☐	☐	☐	☐
g) had to eat **different meals** than the rest of the family because of stomach/chest/throat problems	☐	☐	☐	☐	☐
h) **woken up someone else** in the house because of nighttime stomach/chest/throat problems	☐	☐	☐	☐	☐

In the past 7 days, how often has your child…	Never	Almost Never	Sometimes	Almost Always	Always
i) **felt tired during the day** because of stomach/chest/throat problems	☐	☐	☐	☐	☐
j) **felt frustrated** because of stomach/chest/throat problems	☐	☐	☐	☐	☐
k) been in a **bad mood** because of stomach/chest problems	☐	☐	☐	☐	☐
l) **worried** about having stomach/chest/throat problems	☐	☐	☐	☐	☐
m) **been upset** because of stomach/chest/throat problems	☐	☐	☐	☐	☐

In the past 7 days, how often have YOU…	Never	Almost Never	Sometimes	Almost Always	Always
n) **changed your family's plans** because of your child's stomach/chest/throat problems	☐	☐	☐	☐	☐

4. If your child is in school (including preschool or daycare) and school was in session last week, please answer the questions below.

If your child is not in school (including preschool or daycare) or school was not in session last week, place an "x" in this box: ☐ and you're finished! Thank you for filling out this questionnaire!

In the past 7 days, how often	Never	Almost never	Sometimes	Almost always	Always
a) did your child's stomach/chest/throat problems **get in the way of doing his/her school work or school activities**	☐	☐	☐	☐	☐

In the past 7 days, how often	Never	Almost never	Sometimes	Almost always	Always
b) did your child have a **hard time paying attention** at school because of stomach/chest/throat problems	☐	☐	☐	☐	☐
c) was your child **absent from school** because of stomach/chest/throat problems	☐	☐	☐	☐	☐
d) was your child **late to school** because of stomach/chest/throat problems	☐	☐	☐	☐	☐
e) did your child have to **leave school early** because of stomach/chest/throat problems	☐	☐	☐	☐	☐
f) did your child have to **go to the health room / nurse / office** because of stomach/chest/throat problems	☐	☐	☐	☐	☐

Figure 1: the existing P-GSQ

Figure 2 - the modified P-GSQ for use with children with neuro-disability.

This first set of questions asks about **HOW OFTEN** your child has had different symptoms in the past 7 days. Remember, there are no right or wrong answers. Please choose the answer that you think is best. Mark an "X" in only one box for each question.

1: On how many days in the past 7 days did your child have any of the symptoms listed below? Answer based on what you observed and what your child told you if able. Please include each day that the symptoms were persistent or troubling.

Based on what you observed and what your child told you if able: On how many days in the past week did your child...,	None (0 days)	Sometimes (1 or 2 days)	Often (3 or 4 days	Almost always (5-6 days)	Continually Always/every day (7 days a week)	Not relevant/do not know
a) Have pain or discomfort in the stomach/tummy/chest	☐	☐	☐	☐	☐	☐
b) Increased crying or grimacing	☐	☐	☐	☐	☐	☐
c) Be sick/vomit	☐	☐	☐	☐	☐	☐
d) Have increased tone due to reflux symptoms	☐	☐	☐	☐	☐	☐
e) Draw legs up due to reflux	☐	☐	☐	☐	☐	☐
f) Have bad breath	☐	☐	☐	☐	☐	☐
g) Burp a lot	☐	☐	☐	☐	☐	☐
h) Cough a lot for no reason	☐	☐	☐	☐	☐	☐
i) Hiccup a lot	☐	☐	☐	☐	☐	☐
j) Sounds of noisy breathing or wheezing	☐	☐	☐	☐	☐	☐
k) Have scratchy or hoarse vocalisations/cry	☐	☐	☐	☐	☐	☐
l) Clear his/her throat a lot or recurrent gulps/ swallows	☐	☐	☐	☐	☐	☐
m) Unable to tolerate feed	☐	☐	☐	☐	☐	☐
n) Have trouble falling asleep or lying flat because of problems listed above	☐	☐	☐	☐	☐	☐
o) Wake up at night because of problems listed above	☐	☐	☐	☐	☐	☐

Everyday life:

Now we have a few questions for you about how your child's symptoms may have affected his/her everyday life. Remember, there are no right or wrong answers. Please choose the answer that you think is best. Mark an "X" in only one box for each question.

2: Please read the statements below and tell us how often your child has been affected by reflux in this way in the past 7 days

In the past 7 days how often has your child...	Never (0 days)	Some-times (1-2 days)	Often (3-4 days)	Mostly (5-6 days)	Always (7 days)	Do not know
a) Been unable to concentrate or do any activities because of stomach/chest problems	☐	☐	☐	☐	☐	☐
b) Needed a change in plan/routine because of stomach/chest problems	☐	☐	☐	☐	☐	☐
c) Had to change position because of stomach/chest problems	☐	☐	☐	☐	☐	☐
d) Changing sleep patterns because of night time stomach/chest problems	☐	☐	☐	☐	☐	☐
e) Slept more during the day because of stomach/chest/throat problems	☐	☐	☐	☐	☐	☐
f) Changed behaviour because of stomach/chest problems	☐	☐	☐	☐	☐	☐
g) Been more upset because of stomach/chest problems	☐	☐	☐	☐	☐	☐
h) Did your child need extra prescribed medicines to ease their pain/discomfort	☐	☐	☐	☐	☐	☐
i) Did your child need other treatments (massage/alternative therapies) to ease their pain or discomfort	☐	☐	☐	☐	☐	☐

If your child is not in school (including preschool or day care) or school was not in session last week, place an 'x' in this box ☐ : and you're finished. Thanks for filling out your questionnaire.

3: If your child is in school (including preschool or day care) and school was in session last week, please answer the questions below, and include information school/respite carers have told you:

In the past 7 days how often ...	Never (0 days of school)	Some-times (1 day of school)	Often (2-3 days of school)	Mostly (4 days of school)	Always (5 or more days of school)	Do not know
j) Did your child's stomach/chest problems get in the way of school activities	☐	☐	☐	☐	☐	☐
k) Did your child struggle to pay attention at school because of stomach/chest problems	☐	☐	☐	☐	☐	☐
l) Was your child absent from school because of stomach/chest problems	☐	☐	☐	☐	☐	☐
m) Was your child late to school because of stomach/chest problems	☐	☐	☐	☐	☐	☐
n) Did your child have to leave school early because of stomach/chest problems	☐	☐	☐	☐	☐	☐
o) Did your child have to leave the classroom because of stomach/chest problems	☐	☐	☐	☐	☐	☐
p) Did your child need extra medicines or other treatments at school (massage/alternative therapies) to ease their pain or discomfort	☐	☐	☐	☐	☐	☐

In the past 7 days for You	Never (0 days)	Some-times (1-2 d)	Often (3-4 days)	Mostly (5-6 days)	Always (7 days)	Do not know
a) How often has stomach/chest problems in your child impacted on your family life?	☐	☐	☐	☐	☐	☐

G24

Twenty years of Paediatric Barrett's Oesophagus in Southwest London: A single centre experience

Tania Bhaduri and Attah Ocholi.
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Introduction:
In adults, Barrett's oesophagus is recognised as a pre-malignant condition requiring routine surveillance for oesophageal adenocarcinoma. However, it is rare in children. Consequently, there is very little data on the epidemiology of Barrett's oesophagus and surveillance in the paediatric population.

Aim:
The aim of the study was to analyse the prevalence of Barrett's oesophagus in a paediatric gastroenterology tertiary centre. We describe the clinical characteristics, underlying risk factors and outcomes in these patients.

Methods:
We retrospectively studied children that had been diagnosed with Barrett's oesophagus over a 20-year period at our tertiary paediatric gastroenterology centre. Using electronic notes, we reviewed their demographics (age and gender), diagnosis and co-morbidities, treatment and whether there were complications associated with Barrett's oesophagus.

Results:
We identified 11 patients with a histological diagnosis of Barrett's oesophagus over a 20-year period. There were 8 males (73%) and 3 females (27%). The mean age of diagnosis was 12.1 ± 3.0 years. All patients had gastro-oesophageal reflux disease (GORD). In one patient Helicobacter pylori was also diagnosed. All patients had co-morbidities. The most common was oesophageal strictures (N=3; 27%), which were diagnosed prior to Barrett's oesophagus. One patient had had gastro-intestinal bleeding, another had ulcerative colitis and another had oesophageal atresia with tracheo-oesophageal fistula, oesophageal dysmotility and eosinophilic oesophagitis. Neurological conditions were common. Two patients had cerebral palsy with and without epilepsy, one child had Cri-du-chat syndrome, one child had T20p+4p deletion and another had T21 with a spinal cord lipoma and a neuropathic bladder. Eight patients (73%) had surgery prior to diagnosis of Barrett's oesophagus. These were insertion of gastrostomy (N=4), fundoplication (N=4) and oesophageal dilatation (N=4). One child had an oesophageal atresia and TOF repair, Nissens fundoplication and required oesophageal dilatations.

All of the 9 patients that we were able to follow up were treated with medical management using a proton-pump inhibitor such as omeprazole or H2-Receptor antagonist such as ranitidine. Two patients underwent fundoplication and another patient required further oesophageal dilatation for stricture. All children had surveillance endoscopies follow-up or have an endoscopy planned. The average number of surveillance endoscopies was 2. The time between endoscopy ranged from 1 month to 60 months. The majority of patients (89%) had ongoing Barrett's oesophagus on follow-up endoscopies. One child had normal epithelium on subsequent endoscopy. No patients were diagnosed with oesophageal carcinoma (N=8, mean follow up 6.8 ± 6.1 years post-diagnosis).

Summary:
Paediatric Barrett's oesophagus is a rare disease with little data available. Although our cohort was small, there were no cases of oesophageal adenocarcinoma identified. There is probably a strong relationship between underlying GORD and Barrett's oesophagus, as previously

described in the literature. Furthermore, neurological and oesophageal disorders were common. Anti-reflux medications are standard in Barrett's oesophagus and procedures such as fundoplication are common.

G25

Efficacy of a shorter bowel prep regime trialled during constraints from COVID19

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Background
Bowel preparation remains a significant barrier for patients who need to undergo colonoscopy and is recognised by children as the most difficult aspect of the colonoscopy process. Inadequate bowel preparation can lead to increased procedural times, lower caecal intubation rates, and the need for repeat colonoscopy. Practice across paediatric units providing colonoscopy is not uniform with regard to the total number of days of prep prior a colonoscopy and the agent(s) used. Data comparing a two-day regime vs a shorter one-day regime in children is limited. Restrictions during COVID19 including shielding, need for PCR testing, reduction in theatre capacity led to a re-appraisal of the need for a 2-day bowel prep, which was standard practice until 2020.

Aim
To evaluate the efficacy and safety profile of a shorter 1-day bowel prep regime in children undergoing colonoscopy and compare this to a standard 2-day regime.

Methods
Data was collected prospectively on patients who were prescribed a one-day regime prior to colonoscopy. The data was then compared with similar data on patients who were prescribed a two-day regime from an audit carried out 1 year prior to the COVID19 pandemic. The one-day regime involved taking a high dose of senna followed by two doses of picolax (dose dependent on age). The two-day regime involved a smaller dose of senna followed by three doses of picolax. Comparison was carried out between the two regimes. Boston Bowel Preparation Scale (BBPS) was used to assess the efficacy of bowel preparation. The maximum score possible for the BBPS is 9, and a score of ≥2 in all 3 segments is considered optimal for colonoscopy [1].

Results
There were 24 patients in the one-day bowel prep group and 19 patients in the two-day group. The mean age of children in the two groups were identical (11.4). The majority of patients in both groups received their bowel preparation at home. The indications for colonoscopy were very similar in both cohorts with IBD and PR bleeding being the most common indications. The median BBPS score in the 2-day regime was 6 and was 7 in the 1-day regime. 67% of patients in the one-day group had a BBPS score ≥2 in all 3 segments compared with only 47% of patients in the two-day group. In each group one procedure could not be completed due to inadequate bowel preparation.

Conclusions
The one-day bowel preparation was not inferior to the two-day regime. The higher dose of senna used in the shorter 1-day regime was well tolerated. There appears to be little to gain from a longer bowel prep regime. There are several benefits of the one-day regime such as acceptability by patients, fewer days off school/work, reduced numbers of medication doses, and fewer inpatient hospital days necessary to admit for supervised bowel prep.
[1] Lai, E.J., Calderwood, A.H., Doros, G., Fix, O.K. and Jacobson, B.C., 2009. The Boston bowel preparation scale: a valid and reliable instrument for colonoscopy-oriented research. Gastrointestinal endoscopy, 69(3), pp.620-625.

G26

Detailed analysis of PEDSQL results can more accurately assess impact of Functional Gastrointestinal Disorders on quality of life in paediatric patients and their families.

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Background
Functional gastrointestinal disorders (FGID) are a heterogeneous group of disorders defined as a variable combination of chronic or recurrent gastrointestinal symptoms that occur in the absence of structural or biochemical abnormalities. This group of conditions are common in the paediatric population with an estimated prevalence from 27.1% to 38.0%, and almost 21% of patients presenting with more than one FGID. Indeed, FGID are a familiar challenge for any paediatric gastroenterologist, with functional constipation alone accounting for up to 25% of workload.

Although life-threatening complications and outcomes are rare, FGIDs and accompanying symptom profiles cause significant morbidity and impact on the quality of life (QOL) of patient and their families. In many paediatric gastroenterology departments psychological support is not routinely available as part of the treatment package for management of FGID's.

Aim:
In this article we compare impact on QOL of FGID's when compared with organic gastrointestinal disorders (OGID's), and demonstrate how to achieve greater insight into this impact using a more detailed analysis of the PEDSQL questionnaire results.

Subject + Methods:
Data was collected from the PEDSQL questionnaires completed by the patient and their caregiver as part of the psychology assessment, for patients identified as having FGID as per the Rome IV criteria.

Results:
54 patients (50% male) with gastrointestinal disorders were included, age range 5-17 years: Functional abdominal pain not otherwise specified (FAPNOS) n=24, constipation n=13, inflammatory bowel disease (IBD) n=12, rumination syndrome n=3, eosinophilic oesophagitis n=2. In the FGID group the average child-reported total score was 56.4 (±17.2) compared with 66.13 (±12.6) in the OGID group. The average child-reported psychosocial and physical scores in the FGID group were 56.6 (±16.04) and 57.62 (±23.1) compared with 63.91 (±13.2) and 70.31 (±19.7) in the OGID group. Analysis of parent-reported scores revealed that parents in the FGID and OGID groups rated QOL differently to their children in all 3 domains (psychosocial, physical and total overall score), as demonstrated in table 1. The average total parent-reported score in the FGID was 53.49 (±17.6) and 54.69 in the OGID group, both of which are lower than the child-reported scores. Discrepancies between child-reported and parent-reported scores were noted across the majority of disease sub-groups. Please see table 1 for further breakdown of results.

Table 1:

	CHILD-REPORTED			PARENT-REPORTED		
Condition	**Average Psychosocial**	**Average Physical**	**Average Total**	**Average Psychosocial**	**Average Physical**	**Average Total**
FGID	56.6 (±16.04)	57.62 (±23.1)	56.4 (±17.2)	51.02 (±18.8)	58.2 (±21.6)	53.49 (±17.6)
OGID	63.91 (±13.2)	70.31 (±19.7)	66.13 (±12.6)	53.29 (±15.9)	57.3 (±20.1)	54.69 (±15.4)
Sub-group						
FAPNOS	55 (±16.5)	54.67 (±24.3)	54.7 (±18.1)	50.6 (±21.2)	55.6 (±22)	50.3 (±19.7)
Constipation	60.19 (±16.8)	61.1 (±22.1)	60.5 (±17.1)	50 (±15.5)	58.3 (±21.6)	52.9 (±14.5)
RS	52.2 (±11.1)	70.8 (±15.4)	58.7 (±10.4)	58.6 (±10.6)	78.1 (±5.5)	60.5 (±5.9)
IBD	62.6 (±12.6)	71.6 (±18.9)	65.8 (±11.7)	51.8 (±16.5)	58.1 (±20.8)	54 (±16)
EoE	71.65 (±18.8)	62.5 (±30.9)	68.5 (±23.1)	60.8 (±13)	50.3 (±14.6)	58.1 (±16.2)
Table 1: Summary of average scores across main domains and disease subgroups						

Summary and Conclusion:

Our data shows that patients with FGID's have lower QOL when compared with other OGID's. In addition, there were frequent discrepancies observed between the child and their parent, reflecting a different experience or perception of QOL. We suggest that a detailed analysis of the PEDSQL questionnaire result provides a deeper insight into the experience of the patient and their caregiver, and that subsequent sharing of these results can be used as a useful aid for management in a resource limited setting. In order to adequately and holistically support these patients and their families we also advocate for the provision of psychological support as a mandatory part of the treatment package for patients with FGID and their caregivers.

G27

Screening for adrenal insufficiency in children treated with swallowed topical steroids for eosinophilic oesophagitis: a single center experience

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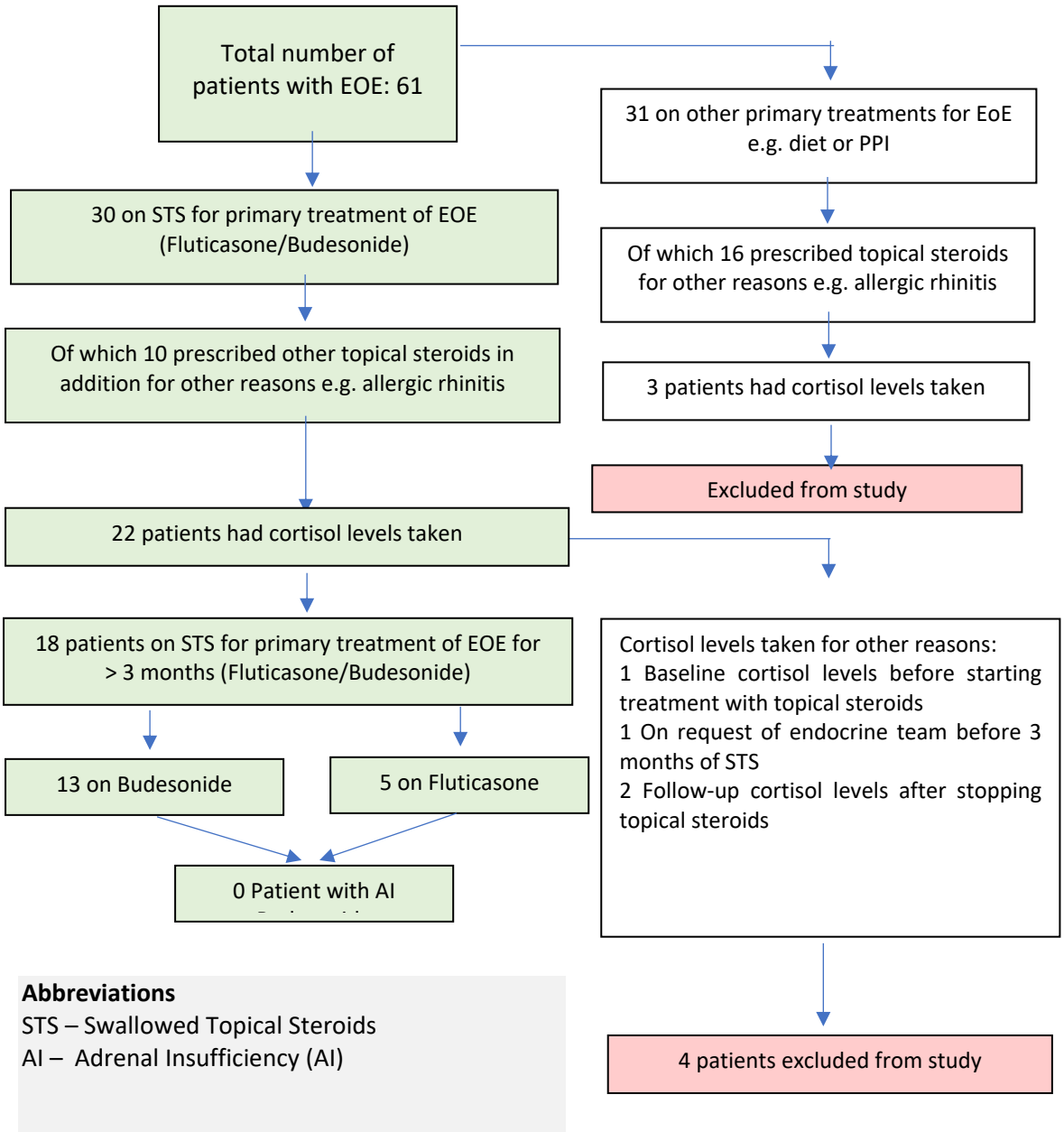
Background: Few studies report the prevalence of iatrogenic adrenal insufficiency (AI) in children treated with swallowed topical steroids (STS) for eosinophilic oesophagitis (EoE). The reported prevalence of AI based on a morning serum cortisol level followed by confirmatory low-dose adrenocorticotropic hormone (ACTH) stimulation test varies from 5% to 43% in this population. In this study we aimed to identify prevalence of AI among the patients taking STS for EoE in our multidisciplinary clinic.

Methods: Clinical and biochemical screening for AI was performed from January 2020 until November 2021. Patients were screened for symptoms of AI and serum morning cortisol and ACTH when assessed in the EoE clinic. If low levels of serum morning cortisol were detected patients were referred for endocrinology evaluation and ACTH stimulation test. Data including gender, age, STS, formulation, duration and indication were collected. See Figure 1 for study design.

Results: Of the 61 patients followed up in the EoE clinic at the time of the study, 30 (49%) patients were on treatment with STS for a duration >3 months. Of them, 18 (60%) (12 males; median age 12 years, range 3-16) were tested for morning cortisol and ACTH levels. STS in use were oral viscous budesonide (OVB) in 13 (72%) and fluticasone metered dose inhaler (MDI) in 5 (28%). The dose of OVB ranged from 1 to 2 mg/day and fluticasone MDI ranged from 250 to 500 mcg/day. Ten patients (56%) were on concomitant other topical steroids for atopic comorbidities. Median levels of cortisol was 235 mmol/l (range 97-637; normal values 110-560) and ACTH was 18 ng/l (range 8-83; normal values 10-50). No patient reported symptoms suggestive of adrenal suppression. All patients showed normal levels of fasting morning cortisol and 2 patients showed normal cortisol response with altered ACTH levels.

Conclusions: Monitoring of patients on STS requires consideration of potential risks such as AI, documented at least 5%-10% (ref JPGN 70 (3) March 2020), similar in Hsu et al and higher in Harel et al. Children with EoE and/or multi-system allergic disease may have red-flag symptoms of loss of appetite, weight loss or abdominal pain; without AI. Our study supports AI being a rare complication of STS such as budesonide or fluticasone, even when on combined swallowed and intranasal steroids. Protocols should include adrenal axis testing for longer term monitoring of children with EoE on STS.

Figure 1. Study Design



Abbreviations
STS – Swallowed Topical Steroids
AI – Adrenal Insufficiency (AI)

G28

Psychosocial interventions for the treatment of Functional Abdominal Pain Disorders in Children: A systematic review and meta-analysis

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Importance: Functional abdominal pain disorders (FAPDs) can severely affect the life of children and their families, with symptoms carrying into adulthood. Their management is also a burden to clinicians and healthcare systems.

Objective: Systematically review the efficacy and safety of psychosocial interventions RCTs for the treatment of FAPDs.

Data sources: PubMed, MEDLINE, EMBASE, PsycINFO, Cochrane Library
Study selection: All RCTs that compared psychosocial interventions to any control or no intervention, for children with FAPDs, aged 4-18 years.
Data extraction and synthesis: Pairs of the authors independently extracted data of all included studies, using a pre-designed data extraction sheet. One author acted as arbitrator. Risk of bias was assessed using the Cochrane risk of bias tool, and certainty of the evidence for all primary outcomes using GRADE.

Main Outcome(s) and Measure(s): Primary outcomes were treatment success, pain frequency, pain intensity, and withdrawal due to adverse events. Dichotomous outcomes were expressed as RR with corresponding 95% CI. Continuous outcomes were expressed as MD or SMD with 95% CI.

Results: Thirty-three RCTs with a total sample of 2657 children were included. Twelve studies compared CBT to no intervention, five CBT to educational support, three yoga to no intervention, two hypnotherapy to no intervention, two gut-directed hypnotherapy to hypnotherapy, two guided imagery to relaxation. Seven looked at other unique comparisons. We found moderate certainty evidence, due to risk of bias, that CBT probably leads to higher treatment success numbers (n=324, RR 2.37, 95% CI 1.30 to 4.34, NNT=5), lower pain frequency (n=446, RR -0.36, 95%, CI -0.63 to -0.09) and intensity (n=332, RR -0.58, 95%, CI -0.83 to -0.32) than no intervention; low certainty evidence, due to high imprecision, that there may be no difference between CBT and educational support for pain intensity (n=127, MD −0.36, 95% CI −0.87 to 0.15); low certainty evidence, due to risk of bias and imprecision that hypnotherapy may lead to higher treatment success compared to no intervention (n=91, RR 2.86, 95% CI 1.19 to 6.83, NNT=5); low certainty evidence, due to risk of bias and imprecision, that yoga may have similar treatment success to no intervention (n=99, RR 1.09, 95% CI 0.58 to 2.08).

Conclusions and Relevance: This evidence demonstrates that CBT and hypnotherapy should be considered as a treatment for FAPDs in childhood. Future RCTs should address quality issues so that the overall certainty can be enhanced further, as well as considering targeting these interventions to patients who are more likely to respond and the role of combination therapy.

There was no funding for this review. PROSPERO registration number: CRD42020159847

G29

Treatments for intractable constipation in childhood

Vassiliki Sinopoulou[1], Morris Gordon[1], Shaman Rajindrajith[2] and Marc Benning[3]
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Introduction
Chronic constipation is a global public health problem that affects the lives of children and caregivers. A subset of children with constipation do not respond to standard medical management and are considered as having intractable constipation. Management of these children is a challenging problem for practicing pediatric gastroenterologists.

Aim
We set out to evaluate the efficacy and safety treatment options of intractable constipation in children.

Subjects and methods

We searched Pubmed, MEDLINE, EMBASE, the Cochrane Central Register of Controlled Trials, ClincalTrials.gov, and the World Health Organization International Clinical Trial Registry Platform (ICTRP) froth their inception to July 2021. Two authors independently identified relevant papers, extracted data, and evaluated risk of bias tool. The Rome III committee's primary and secondary outcomes were used to evaluate the efficacy of interventions. We used the GRADE criteria to assess the overall certainty of the evidence.

Results
Eight randomised controlled trials on 1197 children from 6 months to 18 years were included in the review. All studies compared different interventions. The intervention comparisons were: botulinum toxin injection to exclusive therapy with stool softeners; lubiprostone to placebo; rectal enemas and conventional therapy to conventional therapy only; erythromycin to placebo; : botulinum toxin injection to myectomy of the internal anal sphincter; personalised dietary advice to physician dietary advice; prucalopride to placebo; and transcutaneous electrical stimulation to sham therapy. No conclusions could be reached on any of our outcomes due to the very low certainty of the evidence resulting from low participant numbers, risk of bias and high heterogeneity between included participants and interventions.
Conclusion
No conclusions can be reached on the efficacy and safety of any of the above therapies due to limited numbers of participants per comparison, high heterogeneity between studies and interventions, capricious reporting of data, and issues with risk of bias. Therefore, there is no evidence to support using any of these treatments in clinical practice at present. Further well-designed, appropriately powered, randomized controlled trials are essential to generate more robust evidence-based clinical interventions for the management of intractable constipation. A lack of consensus definition on intractable constipation is an issue that needs to be resolved in the next iteration of the ROME criteria, which will allow for more homogenous future RCTs.

G30

Unusual cause of recurrent vomiting with failure to thrive in an infant

Vybhav Venkatesh and Antaryami Pradhan.

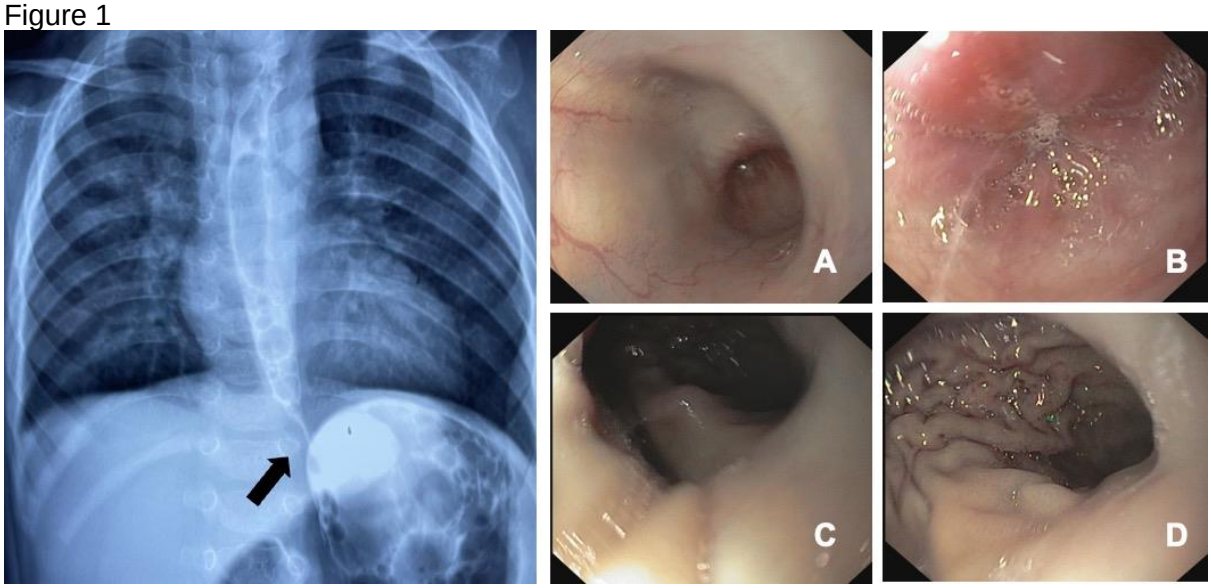
Introduction and Aim: To describe a case of an infant with recurrent vomiting from an unusual cause, who had significant delay in diagnosis leading to severe failure to thrive

Methods and Results:
A ten-month-old boy, symptomatic from 1 month of age with recurrent episodes of regurgitation, non-projectile vomiting was admitted for evaluation. There was history of recurrent episodes of cough and breathlessness requiring hospital admissions over the past few months. He was being treated as a case of gastro esophageal reflux disease (GERD). The postnatal history was uneventful and he weighed 2.6 kg at birth. On examination, the child was severely malnourished and weighed 3.8 kg. Systemic examination was unremarkable except for few bilateral fine crackles on chest auscultation. Investigations revealed anemia with a hemoglobin of 9.5 g/dl. The blood gas analysis, liver, kidney and thyroid function tests were with in normal limits. Ultrasonography of the abdomen showed normal pylorus length and thickness as well as normal relationship of superior mesenteric vessels. A barium swallow examination performed to detect any obstructive esophageal pathology like stricture or stenosis, showed a dilated esophagus with hold up of contrast and narrowing of the lower end with a 'rat tail' appearance (figure 1). Upper gastrointestinal endoscopy (UGIE) showed a dilated esophagus and mild resistance while negotiating the gastroesophageal junction (figure 1A-D) and there was no evidence of any stricture or web/diaphragm. Esophageal manometry could not be performed due to technical difficulty. With the findings highly suggestive of achalasia cardia, he underwent Heller's myotomy along with fundoplication. Follow up examination one month post procedure showed an asymptomatic child who started to gain weight.

Summary and Conclusion:

Achalasia cardia is an idiopathic, primary esophageal motility disorder, characterized by the failure of relaxation of lower esophageal sphincter due to degeneration of the inhibitory neurons. It is usually seen in adults and a diagnosis of achalasia is extremely rare in the infantile period. Typical presentations in children include dysphagia, vomiting and weight loss. Diagnosis can be challenging and requires a high index of suspicion, especially in infants as the symptoms of vomiting, regurgitation, feeding difficulties and recurrent pneumonia can be seen with other common disorders like GERD and almost 50% percent are treated with anti-reflux therapies prior to the diagnosis of achalasia. Though barium swallow and UGIE are helpful in the diagnosis, high resolution manometry is the gold standard for diagnosing achalasia, but can be difficult in infants and children. Although pneumatic balloon dilation, botulinum toxin injections and more recently per oral endoscopic myotomy have been used to treat childhood achalasia, surgical treatment is definitive with good long-term results.

Figure 1



IBD

Dr Falk Posters

IBD 1

Implementation of an electronic clinical management system for Paediatric Inflammatory Bowel Disease Biologic Multi-Disciplinary Team Meetings- Experiences from a Tertiary Gastroenterology Centre

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Introduction
A multidisciplinary team (MDT) approach facilitates the holistic care of children with inflammatory bowel disease (IBD). The 2019 national IBD standards recommend the use of an electronic clinical management system (CMS) to coordinate care efficiently, as well as provide a tool for quality improvement. We describe our experiences of implementing the Infoflex CMS for Biologic MDT meetings and the impact on clinical outcomes.

Background
A one-hour monthly Biologics MDT meeting was established in May 2020 co-ordinated by the clinical nurse specialists, and attended by paediatric gastroenterologists, clinical nurse specialists, and dieticians. Prior to CMS implementation, meetings were co-ordinated using Microsoft Excel spreadsheets. This had multiple limitations – it did not provide an accurate list of patients and was unable to capture updates in patient care. Outcomes had to be documented in a different system, and letters created in a third system.
To address these issues, the Infoflex CMS was adopted for use at the biologics meeting. Patients on biologic therapy were listed for an Annual Biologics MDT in Infoflex, generating a worklist of patients. Clinical data was entered onto the system in advance to facilitate effective discussions. After discussion, action points were identified and recorded in Infoflex. These actions were reviewed at the next meeting, and marked as complete once performed.

Methods
We reviewed outcomes for patients discussed in the biologics MDT meeting from inception (May 2020) to 31 October 2021. Data was retrieved from the Infoflex PMS (Version 5.70.130, Civica) and analysed using Microsoft Excel (Version 14.0, Microsoft).

Results
In 17 months, 78 MDT discussions were held for 61 patients, representing 51% of our 119 paediatric IBD cohort on biologics or small molecules. 17 patients were discussed twice in separate MDTs.

Of the 61 patients discussed, 35 (57%) were male. 42 patients had Crohn's disease, 10 patients had ulcerative colitis, and 9 patients had inflammatory bowel disease- unclassified (IBD-U). Median age of patients at discussion was 14.5 years (range 5.8-16.7). 36 (59%) patients were on infliximab, 20(33%) on adalimumab, 3 (5%) on vedolizumab, and one patient each on ustekinumab and tofacitinib.

The MDT recommended changes in management in 38 (49%) cases. Further disease assessment was requested in 29 cases. These included repeat calprotectin (17), further imaging or endoscopy (6), drug or metabolite levels (11) and genetics (2). Medication changes were made in 11 cases. Infliximab frequency was increased in two patients. Biologics were stopped in two patients, and biologic switched in three patients. Azathioprine was started in one patient and stopped in two patients. One patient was started on Vitamin D.

Discussion
The Biologic MDT can provide a safe and effective framework for IBD patients on biologic

agents. The Infoflex CMS has allowed clinical data to be summarised, and outcomes and actions from the MDT to be managed and communicated, all within one system. This streamlines the processes involved whilst also providing a data collection to feed in to both local and national audit.

IBD 2

A comparison of the effectiveness of a generic oral nutritional supplement with a specialised formula in the treatment of active paediatric Crohn's Disease

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Background and Aims – Exclusive enteral nutrition (EEN) is the recommended induction treatment of mild to moderate active paediatric Crohn's Disease (CD). This study compared outcomes of two proprietary polymeric formulas. Treatment effectiveness was examined along with practical aspects of formula delivery and differences in estimated treatment costs.

Methods – Data were retrospectively collected from CD patients who received a generic oral nutritional supplement (Fortisip) across two centres (RCH, Melbourne and RHSC, Edinburgh). This was compared to a prospective cohort (RHC, Glasgow) who used a specialised formula (Modulen IBD). The data collected included patient demographics, remission rates, biochemical markers, administration method and anthropometrics. The estimated treatment cost was performed by comparing price per kcal between each formula.

Results – 171 patients were included (106 Fortisip, 65 Modulen IBD, 70/171 female; median age 13.3 yrs.). No difference was demonstrated in remission rate (Fortisip n=67/106 [63%] vs Modulen IBD n=41/64 [64%], p=0.89), non-adherence rate (Fortisip n=7/106 [7%] vs Modulen IBD 3/64 [5%], p=0.57) or method of administration (NGT Fortisip use n=16/106 [12%] vs Modulen IBD 14/65 [22%], p=0.31). There was no difference in reduction of biochemical disease markers between the groups (CRP p=0.13, ESR p=0.49, FC p=0.94). However, there was a cost-saving of around £500/patient/course if the generic oral nutritional supplement was used.

Conclusions – The generic oral nutritional supplement and specialised formulas both had similar clinical effectiveness in induction of remission in paediatric CD. However, there is considerable cost saving when using a generic oral nutritional supplement.

IBD 3

Weight-based prescribing of thiopurines may not accurately optimise metabolite levels in the safe and therapeutic range: A paediatric IBD study

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Background: Thiopurine drugs have been widely used in the treatment of IBD for several decades. In recent years, a better understanding of thiopurine metabolism has resulted in optimising treatment doses based on the metabolite profiles rather than the conventional weight-based dosing. For the major metabolite 6-TGN, levels between 235-450 pmol are adopted in IBD treatment guidelines as therapeutic thresholds associated with increased likelihood of efficacy and reduced risk of cytopenias, whereas 6-MMPN > 5700 pmol is associated with hepatotoxicity. There is a scarcity of studies in the paediatric population assessing the association of thiopurine metabolite profiles with the treatment doses used.

Aims: This study investigates the relationship between weight-based thiopurine dosing and thiopurine metabolite levels in a paediatric IBD cohort.

Methods: The study included children recruited to the 'Genetics of Paediatric IBD Study-Southampton', diagnosed with IBD before the age of 18 years. Thiopurine metabolite levels were retrospectively recorded in paediatric patients on a stable dose of thiopurines for at least 2 months alongside drug doses adjusted for weight at the time of metabolite testing, TMPT activity and other key descriptive features. Patients were excluded from the final analysis if concurrent dose and weight measurements were not available at the time of thiopurine metabolite testing. Patients with documented non-compliance were also excluded.

Results:

The study assessed data from a total of 376 paediatric patients with IBD; males- 218 (58%) and females- 158 (42%), median duration of follow-up- 51 months (IQR, 29- 81). A total of 251 readings measuring 6-TGN levels with concurrent dosage (mg/kg) were available in 99 patients (azathioprine= 153 measurements in 69 patients, 6-mercaptopurine= 98 readings in 30 patients). The median dose of azathioprine was 1.99 mg/kg (IQR 1.62- 2.25) and 6-mercaptopurine 1.19 (IQR 0.86- 1.4). The median dose of azathioprine and 6-mercaptopurine to achieve 6-TGN levels in the therapeutic range (235-450) was 2.01 mg/kg (IQR 1.64- 2.27, n= 60 measurements) and 1.26 (IQR 0.92- 1.39, n=41) respectively. The median dose observed to exceed the therapeutic upper limit of 450 pmol was very close at 2.11 (IQR 1.7-2.34, n= 47 measurements) and 1.15 (IQR 0.8-1.45, n= 32 measurements) for azathioprine and 6-mercaptopurine respectively in individuals with normal TPMT activity. In the azathioprine group: 6-TGN levels correlated positively with the drug dose/kg (p=0.0047); 6-TGN levels correlated negatively with TMPT activity (p= 0.0083), but the association did not reach statistical significance when patients with TPMT activity below the normal reference range were excluded (p= 0.07). In the 6-mercaptopurine group: no significant association was observed for 6-TGN levels with dose/kg (p= 0.452) as well as with TPMT activity (p= 0.439 including all patients, p=0.476 for patients with normal TPMT). No significant gender differences were observed for 6-TGN and 6-MMPN.

Conclusions: Our study shows that toxic levels of metabolites can be seen even when thiopurines are prescribed within the 'safe' prescribing dose range and despite normal TPMT levels. Thiopurine metabolites should be routinely monitored in all patients treated with thiopurines for better and safer outcomes.

IBD 4

Remission rates after biologic class switch in children with inflammatory bowel disease

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Background
Anti-TNF therapy (infliximab and adalimumab) is effective in the management of children with inflammatory bowel disease (IBD). In primary non-response or loss of response to anti-TNF, switching biologic class may be useful. Remission rates with ustekinumab (anti-IL2/23 monocloncal antibody) of 39%, and with vedolizumab (anti-a4b7 integrin monoclonal antibody with gut selective anti-inflammatory activity) of 39% (ulcerative colitis (UC)) and 24% (Crohn's disease (CD)) have been reported.

Aims
To evaluate remission rates in children with IBD in our tertiary centre after switching biologic class. We hypothesised that remission rates would be similar to published rates.

Subjects and Methods

Children who had switched biologic class were identified from the IBD database and electronic patient records. Data was collected on gender, age at diagnosis, diagnosis, therapy including biologics, reason for switch and clinical and endoscopic response.

Results
Of a total of 460 children with IBD, 165 (35.8%) were receiving biologics. Age at diagnosis ranged from 4-14 years. 15 had CD, 1 had UC and 1 had IBDU favouring CD. 17/165 (10%) switched class due to active disease; 5/17 (29.5%) to ustekinumab, 12/17 (70.5%) to vedolizumab.

All received immunomodulators prior to biologics. 16/17 received infliximab as first biologic. 15/17 are receiving concurrent immunomodulators; 2/17 are on biologic monotherapy. All 5 patients switched to ustekinumab had initially switched within anti-TNF class; 80% received infliximab as initial anti-TNF therapy.

2/5 had primary non-response, 2/5 had antibody formation, 1/5 had secondary loss of response and psoriasis on anti-TNF.

40% of patients who switched from anti-TNF to ustekinumab showed clinical response but were yet to undergo endoscopic reassessment. 3/5 did not show clinical response, of which 2/3 were non-compliant with immunomodulators (both secondary non-response and antibody formation).

Of the patients 12 switched to vedolizumab, all received infliximab initially. 75% switched within anti-TNF class prior to switching to vedolizumab.
3/12 had primary non-response, 4/12 had secondary loss of response, 1/12 had secondary loss of response and psoriasis on anti-TNF. 2/12 had antibody formation, 1/12 had secondary loss of response to infliximab then antibodies to adalimumab, 1/12 had an adverse reaction to infliximab then antibodies to adalimumab.

Overall, 75% achieved clinical response with 16% confirmed endoscopic remission after switching. 25% had not achieved clinical response. 2/12 plan to switch from vedolizumab to ustekinumab aiming to achieve clinical response.

Summary and Conclusion

82% switched between anti-TNFs before switching class. Reasons for switching class were primary non-response (30%), antibodies to anti-TNF (35%) and secondary loss of response (35%) (1 patient developed antibodies to one anti-TNF and loss of response to another). 70% achieved clinical response on switching. Although most children are yet to have endoscopic assessment, all children assessed had achieved endoscopic remission. Switching class may benefit children who do not respond to anti-TNF. The need to switch within several classes may be required for a select group of children with resistant disease. 3 children were non-compliant with immunomodulator therapy. Reasons for immunomodulator non-compliance should be explored.

Endoscopic re-evaluation is important to ensure mucosal healing particularly in this group of children.

IBD 5

Outcome of perianal fistulae in children with Crohn's disease in a tertiary referral centre of inflammatory bowel disease in the United Kingdom

Ghada Said, Sabarinathan Loganathan, Sian Kirkham, Michalis Papadopoulos and David Devadason.
Nottingham University Hospital, NHS Trust

: Background:

Crohn's disease (CD) is a chronic inflammatory bowel disease that may affect any part of the gastrointestinal tract. Perianal CD disease may include skin tags, fissures, abscesses, strictures, or fistulae. Perianal CD is associated with increased morbidity and poor quality of life.(1) It requires robust medical and surgical treatment. Anti-tumour necrosis factor (TNF) e.g., Infliximab and Adalimumab are the treatment of choice in perianal CD.(2) There is very limited data in the literature about the outcome of perianal and particularly, fistulating CD in children.(3) Magnetic resonance imaging (MRI) pelvis was found to be superior to other imaging modalities in detecting perianal fistulae and abscesses and in delineating the pelvic anatomy and the relationship of the fistula to the anal sphincters.(4)

Aim:
The aim of the study was to determine the outcome of perianal fistulae in paediatric patients diagnosed with Crohn's disease in a large cohort of patients in a referral centre of paediatric inflammatory bowel disease.

Methods:
Patients were recruited from IBD clinic in a tertiary referral centre who are diagnosed with Crohn's disease and had a pelvis MRI scan done in the last ten years between 2011-2021. Data was collected retrospectively. Complex perianal fistula was identified as a fistula originating from a high position, associated with a perianal abscess, anorectal stricture, or rectovaginal fistula.(1)

Results:
Twenty-nine patients were identified who had MRI pelvis scans over a period of 10 years. MRI scan was positive for perianal fistula in 18 patients (62%). Examination under anaesthesia (EUA) was carried out by the paediatric surgical team for 10 patients within an average duration of 1month from doing the MRI scan. Perianal fistula was detected in 50% of EUAs. Ten patients had complex perianal fistulae.

Fistulae were present at the time of diagnosis of Crohn's disease in 7 patients. Four patients were on Infliximab at time of detection of fistulae. Biologics were started within an average of three months from the diagnosis of fistulae. Follow up MRI scans were done in eleven patients (61%).

Resolution of fistulae was seen in 2 patients (11%), both were on biologics before diagnosis of fistula. Fistulae were not detected in EUA in both patients and one of them had a complex fistula.

Conclusion:
In our cohort, closure of perianal fistulae in follow up MRI scans was rare despite the use of anti- TNFs.

IBD 6

What to do with a saxophone penis: A case report

Joseph Chan and Christine Spray.
Royal Hospital for Children, Bristol

Introduction

A saxophone penis is extremely rare in children. This occurs when the penis gets twisted along its long axis, giving the appearance resembling a saxophone (Picture 1). The causes are not well described in Paediatrics. In the adult literature chronic lymphatic obstruction or infection are the main causes.

Aim
To present an interesting case and five-year timeline of a patient affected by a saxophone penis.

Subjects and Methods

A normally fit and well nine-year old boy presented to A&E and was seen by the surgeons in July 2016 with a five-day history of pain and swelling of his penis. The initial impression was balanitis with cellulitis; he received oral and topical antibiotics. He was followed up by the surgical team and referred as an outpatient and reviewed by Paediatric Gastroenterology in October 2016. Skin punch biopsies of the genitalia showed non-caseating granulomas. His initial OGD and ileocolonosocpy were macroscopically and histologically normal. He was diagnosed with genital Crohn's disease.

He was sequentially treated with sulfasalazine, oral prednisolone and azathioprine but continued to complain of pain, swelling and sensitivity and was started on adalimumab in July 2017. There was a good response physically and after 18 months this was stopped. Psychologically he developed issues with chronic pain, sensitivity and school avoidance. One year after stopping anti-TNF therapy he developed loose stools and had poor weight progression. A repeat endoscopy revealed aphthous ulcers in D2 with active inflammation in the duodenum and colon with histology showing granulomas. His response to exclusive enteral nutrition and oral prednisolone was suboptimal and he was re-started on adalimumab in February 2021. He is now 14 years old and on dual therapy with azathioprine and 2 weekly adalimumab.

Summary
We present an interesting case of an adolescent male who initially presented when nine years old with a saxophone penis (genital Crohn's disease). After three and a half years he developed luminal Crohn's disease.

Conclusion
Crohn's disease affecting the genitalia is a rare and challenging diagnosis both physically and psychologically. The terminology used varies by specialty with commonly recognised terms being; 'genital Crohn's', 'anogenital granulomatosis' and 'metastatic Crohn's Disease'. Early MDT discussions including psychology support should be initiated and early anti-TNFs considered. Awareness with our colleagues needs to be raised to improve and streamline local and national referral processes to avoid delays in initiating treatment.

Picture 1 – Saxophone Penis, anterior and lateral views

IBD 7

A review of the factors affecting remission rates in a tertiary paediatric IBD cohort

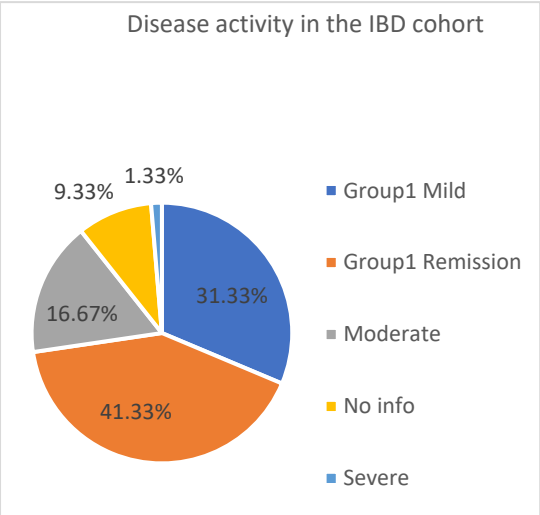
Nisreen Saifuddin[1], Attah Ocholi[2], Nkem Onyeador[2], Thankam Paul[2], Rajat Kapoor[2] and Nicholas Reps[2].
[1]St George's University of London; [2]St George's Hospital, London

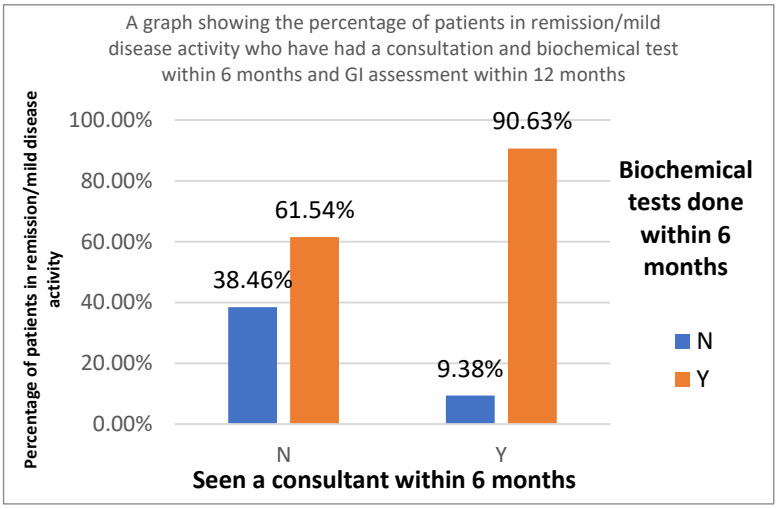
Objectives/Introduction
Inflammatory bowel disease (IBD) is a chronic condition that is commonly diagnosed in the paediatric patient cohort. Due to its relapsing-remitting nature, it is important to tailor the treatment to each patient and achieveing good control as defined by treating to target which is a combination of symptom scores and objective markers including faecal calprotectin, blood tests, drug and metabolite levels, radiological and endoscopy assessment. The aims of this project are to identify the population of patients in remission in the IBD cohort and to identify the factors which affect this, particularly frequency of contact with IBD services.

Methods
A retrospective review was carried out using the data available on electronic hospital records. The data included: patient demographics, type of treatment, most recent biochemical and radiological assessment results and hospital visits from paediatric IBD patients at an NHS hospital. All IBD subtypes were included. A Microsoft Excel spreadsheet was used to collect the data which was then reviewed by a senior consultant and subsequently analysed.

Results
In total, 150 patients were included. 72.67% of these patients were either found to be in remission or had mild disease activity. Higher remission rates/mild disease activity was observed in patients who had seen a consultant and had biological tests done within 6 months (90.63%) as opposed to patients who had not (38.46%). More patients receiving combination treatment of either 5ASA/a biologic and an immunosuppressant were found to be in remission than patients receiving just one or none of these treatments.

Conclusion
There appears to be a link between remission rates and local factors including frequent monitoring through biological and radiological assessments, consultation visits and the type of treatment. Frequent monitoring of IBD patients may lead to higher remission rates. This can be achieved via frequent consultation reviews to include up-to-date symptom scoring indices and biochemical and radiological assessments.


Disease activity in the IBD cohort
9.33%
1.33%
31.33%
16.67%
41.33%
Group1 Mild
Group1 Remission
Moderate
No info
Severe


A graph showing the percentage of patients in remission/mild disease activity who have had a consultation and biochemical test within 6 months and GI assessment within 12 months
Percentage of patients in remission/mild disease activity
100.00%
80.00%
60.00%
40.00%
20.00%
0.00%
38.46%
61.54%
9.38%
90.63%
N
Y
Seen a consultant within 6 months
Biochemical tests done within 6 months
N
Y

IBD 8

Perceptions of Young People with Inflammatory Bowel Disease and their Parents/Carers regarding a Digital Personal Health Record

Intan Yeop[1], Philippa Howsley[2], Richard Hansen[3], Margaret Lee[4], Jenny Epstein[5] and Priya Narula[1].

[1]Sheffield Children's Hospital; [2]NIHR Children and Young People MedTech Co-operative, Sheffield Children's NHS Foundation Trust; [3]Royal Hospital for Children, Glasgow; [4]Crohn's in Childhood Research Association; [5]Chelsea and Westminster Hospital NHS Foundation Trust;

Objectives: Digital personal health records (DPHR) have great potential to empower and equip young people (YP) to effectively manage their health condition. This study aimed to understand the views, requirements and concerns of YP with Inflammatory Bowel Disease (IBD) and their parents/carers regarding a developmentally appropriate and user-friendly DPHR.

Design: Sheffield Children's NHS Foundation Trust, NIHR Children and Young People MedTech Co-operative and Crohn's in Childhood Research Association (CICRA) collaborated to develop and circulate YP and parent/carer versions of the survey to all YP and parents registered with CICRA. Survey respondents were given the options of "yes, no or maybe" in answer to the questions, with the opportunity of commenting on each question in the free text sections. Questions included were "Do you think it would be helpful if the app had alerts to remind you about your hospital appointments?" and "What is your opinion of the app? 0=dislike, 100=like". Responses were collected between January and February 2021.

Results: 25 YP (9-25 years (median 14); 64% female) and 93 parents/carers (44% female) across the UK completed the survey. Both YP and parents/carers rated the idea of the DPHR highly (YP: n=25, median 90(51-100)%; parents: n=86, median 100(4-100)%).

YP and parents/carers would like easy access to information on IBD (YP:80%, parents/carers:89%) for themselves and to share with friends, family and teachers. Information about the transition process (YP:88%, parents/carers:97%), and information and contact details for the paediatric (YP:88%, parents/carers:95%) and adult (YP:88%, parents/carers:97%) clinical teams were felt to be helpful in supporting YP during this important period. The majority of YP and parents/carers would like access to their personal clinical records (YP:96%, parents/carers:89%), medication lists (YP:96%, parents/carers:95%), clinical laboratory results (YP:84%, parents/carers:89%), endoscopy reports (YP:84%, parents/carers:84%), radiology reports (YP:76%, parents/carers: 84%) and hospital appointments (YP:96%, parents/carers:99%). They would also like information on emotional wellbeing (YP:80%; parents:92%), nutrition and diet (YP:60%; parents:87%), preparation for endoscopic procedures (YP:76%; parents:80%), medications and treatments (YP:84%; parents:86%), travel information (YP:84%; parents:93%) and research opportunities (YP:52%; parents:66%).

YP and parents/carers would like interactive features such as symptom tracking function and disease activity indices (YP:84%; parents:88%). Most of the participants would also like the app to provide alerts and notifications for hospital appointments (YP:80%; parents:90%) and blood monitoring appointments (YP:80%; parents:82%).

From the general comments made on a proposed DHPR, YP and parents/carers viewed knowledge on IBD positively and felt that it would be a useful tool to encourage YP involvement in their own care. Some parents/carers would like the ability to regulate the information

accessed by their child to ensure that the information and functions are age-appropriate.

Conclusion: A DPHR would be welcomed by the majority of YP with IBD and their parents/carers. Further co-design with YP, parents/carers, and clinical teams is needed to understand the exact requirements of the app and its design, and to explore potential concerns.

IBD 9

Research priorities in digital technology for adolescents and young persons with Inflammatory Bowel Disease: a James Lind Alliance Priority Setting Partnership.

Arati Rao[1], Charlotte Wong[2], Antony Kalli[3], Jess Manson[3], John McLaughlin[4], Lisa Younge[2], Jochen Kammermeier[5], Gemma Lee[5], Marco Gasparetto[6], Seb Shaji[7], Ruth Wakeman[8], Rachel Ainley[8], Philip Smith[9], Sophie Randall[10], Naila Arebi[2], Philippa Howsley[11] and Priya Narula[11]

[1]St George's Hospital, London; [2]London North West University Healthcare NHS Trust; [3]Parent Representative; [4]Guts UK; [5]Evelina Children's Hospital;[6]Barts Health Children's Hospital; [7]Hull University Teaching Hospital; [8]Crohn's and Colitis UK; [9]CICRA; [10]Patient Information Forum; [11]Sheffield Children's Hospital

Background:

Digital healthcare (DHC) is a rapidly expanding area of healthcare and offers significant opportunities to transform Inflammatory Bowel Disease (IBD) care. DHC cover a wide range of technologies, including and not exclusive to apps, podcasts, websites, social media and patient controlled electronic medical platforms. Application digital technology (DT) in clinical practice should be supported by research evidence. A Priority Setting Partnership (PSP) was set up in collaboration with the James Lind Alliance (JLA), a non-profit organisation, to prioritise research topics that young people with IBD, their carers, and their clinicians consider important for evidence-based implementation of DT in IBD.

Aim:

To create a survey designed to identify the unanswered questions or evidence uncertainties in the use of DT for adolescents and young persons with IBD.

Methods:
PSP meetings were attended by key stakeholders as a Steering Group (SG): paediatric and adult gastroenterologists with an interest in adolescent and young person care from BSPGHAN and BSG respectively, IBD clinical nurse specialists, representatives from the IBD charities CICRA and CCUK and patient and parent representatives. The survey was designed through an iterative process at a series of meetings. The survey was considered complete when there was saturation of changes and the approval by all stakeholders. Readability was assessed by the Flesch-Kincaid Reading Ease test (a measure of average sentence length average number of syllables per word) and Flesch-Kincaid Grade Level test on Microsoft Word. Methods of dissemination were discussed and agreed.

Results:
The final survey consists of three sections. The first captures roles and connection of IBD to the individual completing the survey. The second invites participants to submit questions about DT in two areas: DT to support their condition and improve IBD care, and DT to improve communication with the healthcare team. Questions are open-ended to allow participants to elaborate on their answers. Due to the vast range of DT and potential questions, examples were provided to assist individuals with answering, including the example of a mobile app for recording symptoms and disease activity. The final section for demographic data is optional and will not be linked to responses in sections 1 or 2. Finally, participants are invited to be involved after the survey closes to help with further stages in the prioritisation process. The final survey is shown in Figure 1. The Reading ease test score is 61 (good scores 60 to 70) and Flesch-kinaid grade level is 8.1 (optimal scores 7.0 to 8.0). The survey was approved by the patients within the SG.

Conclusion:
A SG with wide representation for a PSP on DT in IBD was created. As a first step to identify unanswered questions or uncertainties, a readable survey was developed. Research priorities will be identified using the JLA methodology and these will galvanise research on DT to improve disease outcomes and quality of life.

DIGITAL TECHNOLOGY FOR ADOLESCENTS AND YOUNG PERSONS WITH INFLAMMATORY BOWEL DISEASE A Priority Setting Partnership (PSP)
in collaboration with the British Society of Paediatric Gastroenterology, Hepatology and Nutrition (BSPGHAN), British Society of Gastroenterology (BSG) and the James Lind Alliance (JLA)

WHO ARE WE?
We are a group of patients, carers, healthcare professionals and researchers who are passionate about improving the care and quality of life of people living with inflammatory bowel diseases (IBD) such as ulcerative colitis and Crohn's disease.
Together, we are collaborating on a project called a Priority Setting Partnership (PSP), to identify the top 10 research priorities for digital technology in adolescents and young persons with IBD.

WHAT ARE WE DOING?
There are huge opportunities to transform IBD care with digital technologies, but we need to understand the impact that technologies will have and how to best use them. Digital technologies may include apps, podcasts, websites, social media and patient controlled electronic medical platforms.
We are asking people up to and including the age of 25 who are affected by IBD; their families, carers and friends; health and social care professionals to help us identify the top 10 questions that need to be answered by research in this area.

WHY DO WE NEED YOUR HELP?
We would like to hear from you if you are:

- **a)** an adolescent or young person up to and including the age of 25 with IBD
- **b)** a parent, carer or friend supporting an adolescent or young person with IBD
- **c)** a health or social professional involved in the care of IBD patients

Your views will ensure that we focus on the needs of adolescents and young persons living with the condition and guide future research.

WHAT DO I HAVE TO DO?
We are asking you to complete a short 10-minute survey. You don't have to be an expert in technology to take part. Ask us questions about the use of digital technologies based on your experience of living with IBD or supporting someone with the condition.

WHAT HAPPENS AFTER THE SURVEY?
We will look at all the questions that have been asked in the survey and check that they align with this project. For the questions that have not been answered already by research, we would welcome you would help to put these into order of priority. Please leave your contact details at the end if you wish to be involved in this part. Finally, we will come up with a list of the top 10 research priorities which will be publicised to researchers and organisations that fund IBD research.

WHAT WILL HAPPEN WITH MY INFORMATION?
By taking part in this survey, you give us consent to use your anonymized answers and publish these in our project report. We take your privacy seriously so we will not be able to personally identify you.
You may also leave contact details at the end if you would like to continue to help with this project (optional). Personal contact details will be kept confidential.

THERE ARE THREE SECTIONS TO THIS SURVEY:
Section 1:
This asks about who you are to help us understand your role and how you're connected with IBD.

Section 2:
We would like you to ask questions about the use of digital technology in 2 broad areas. You may wish to focus on just one area or both:

Questions about digital technologies to support your condition and have the potential to improve IBD care.
These technologies help your healthcare team with making decisions about diagnosis, treatment, and clinical care. They may also help you self-manage IBD, promote healthier ways of living and monitor your progress.

Examples include mobile apps for recording your symptoms and disease activity or provide information.

Questions about the use of digital technologies to improve communication with your healthcare team. These technologies help to improve the two-way communication between you and the health professionals who look after you.

Examples included instant messaging portals and video consultations that link you to healthcare teams.

Section 3 (optional):
This asks for additional background information about you to help us understand who you are and to ensure that we have captured a range of different experiences. These answers will not be linked to your responses in section 1 and 2.

SECTION 1: ABOUT YOU
It is important to know who you are, the person filling in the form, and how you are connected to IBD.

Which of the following describes you best?
□ I am an adolescent or young person with IBD
□ I am a parent or have experience as a carer of an adolescent or young person with IBD
□ I am a family member of an adolescent or young person with IBD
□ I am a friend of an adolescent or young person with IBD
□ I am a healthcare professional who looks after adolescents or young persons with IBD
□ I am a member of an organisation or charity representing persons with IBD
□ Other – please state……..

SECTION 2: YOUR QUESTIONS
Write down 3 questions that you would like to see answered about the use digital technology in inflammatory bowel disease. This can be in the form of a sentence or a question. You do not have to fill in all of the sections if you don't want to.

My first question/comment

My second question/comment

My third question/comment

e box below if you'd like to

SECTION 3: ADDITIONAL INFORMATION ABOUT YOU (OPTIONAL)

This optional but it is important to understand who is filling out the form to ensure that we have collected views from a range of people with varied experiences.

1. What is your age?

☐ <16 ☐ 16-25 ☐ 26-39
☐ 40-59 ☐ 60-79 ☐ 80+
☐ I prefer not to say

2. Which of the following best describes your gender?

☐ Boy/man ☐ Girl/woman
☐ Non-binary ☐ I prefer not to say
☐ I prefer to self-describe, please state…….

3. What is your ethnic group?

Asian or Asian British

☐ Bangladeshi ☐ Chinese ☐ Indian ☐ Pakistan
☐ Any other background, please describe……..

Black/African/Caribbean/Black British

☐ African ☐ Caribbean
☐ Any other Black/African/Caribbean background, please describe……

Mixed/Multiple ethnic groups

☐ Asian and White ☐ Black Caribbean and White ☐ Black African and White
☐ Any other Mixed/Multiple ethnic background, please describe…….

White

☐ English/Welsh/Scottish/Northern Irish/British
☐ Gypsy of Irish Traveller ☐ Irish
☐ Any other White background, please describe……..

Any other ethnic group

☐ Arab
☐ Any other ethnic group, please describe……

☐ I prefer not to say

4. Where do you live?

☐ England ☐ Wales ☐ Scotland
☐ Northern Ireland ☐ I prefer not to say

WOULD YOU LIKE TO HELP US WITH THE NEXT STEP?

Once the survey has closed, we would like to get back in touch with the people who completed this survey for help with collating research questions into order of importance or urgency. If you would like to take part in this stage, please add your contact details below.

Name…….
Address…….
Telephone number……..
Email……..

Thank you for completing the survey. If you have any questions or would like any further information, please contact:……

Website: www.jla.nihr.ac.uk/priority-setting-partnerships/XXX
Email: …….
Twitter:…….
Facebook:……

IBD 10

Defining the unique histologic phenotype of Paediatric PSC-IBD

Rebecca Little[1], Juan Putra[2], Binita M. Kamath[1], Anne Griffiths[1], Iram Siddiqui[3*], Amanda Ricciuto1*.
[1]The Hospital for Sick Children and University of Toronto, Gastroenterology, Hepatology & Nutrition, Toronto, Canada, [2]The Hospital for Sick Children, University of Toronto, Pathology, Toronto, Canada, [3]The Hospital for Sick Children and University of Toronto, Pathology, Toronto, Canada. *Denotes equal contribution.

Introduction
Eighty percent of paediatric patients with Primary Sclerosing Cholangitis (PSC) have underlying Inflammatory Bowel Disease (IBD). Delineating the unique macroscopic intestinal phenotype of PSC-IBD has revealed a predilection for pancolitis, often more severe in the right colon, backwash ileitis and rectal sparing. However, the histologic characteristics of PSC-IBD have not been critically examined. Furthermore, histologic activity indices developed and used in conventional UC, such as the Nancy Index (NI), haven't been evaluated in PSC-IBD.

Aim
The primary aim of this study was to delineate the histologic phenotype of paediatric PSC-IBD. Secondary aims were to assess the inter-rater reliability and construct validity of the NI in paediatric PSC-IBD.

Subjects and methods
We included children with PSC-IBD and controls with UC with baseline pre-treatment colonoscopy between 2000 and 2018, matched on sex, and age and year at diagnosis. Disease activity colonoscopy was assessed by PUCAI score and physician global assessment of endoscopic severity (ES). Two paediatric GI pathologists independently reviewed diagnostic mucosal biopsies. NI was determined for both the right and left colon. The prevalence of individual histologic features in PSC-IBD versus UC was compared by Chi squared test. Inter-rater reliability was assessed using Fleiss' Kappa and intra-class correlation coefficients (ICC), as appropriate. Construct validity of the Nancy Index was assessed against ES, using Spearman correlations. Logistic regression was used to examine the association between histologic features and ES and clinical outcomes.

Results
50 PSC-IBD patients (median age 13.4 years, 68% male) and 81 UC controls (median age 12.3 years, 65% male) were included. Histopathologically, pancolitis, more severe inflammation in the right colon, and backwash ileitis were all significantly more common in PSC-IBD patients vs. colitis controls (Table 1, all $p<0.05$). Basal plasmacytosis, lamina propria predominant neutrophils and eosinophilia were more common in PSC-IBD (all $p<0.05$). NI inter-rater reliability was very high (ICC >0.9). Right and left Nancy index correlated with corresponding ES in both PSC-IBD and UC controls (for right colon, respectively $r=0.31$ and 0.34, $p<0.05$; for left colon, respectively $r=0.52$ and 0.26, $p<0.05$). Both the right and left Nancy Index correlated moderately with PUCAI in controls ($r=0.31$-0.42, $p<0.01$) but not in PSC-IBD ($r=0.1$, $p>0.05$).

The right NI was predictive of a need for steroids in PSC-IBD (OR 2.92, 95% CI 0.996 – 8.62). In controls, crypt abscess ($p=0.034$), ulceration ($p=0.05$) and chronic inflammation ($p< 0.01$) (all components of the NI) accounted for most of the variance in ES, as shown in Table 2. While these features were also associated with ES in PSC-IBD, additional features including surface villiform change, basal plasmacytosis and eosinophilia, were significantly (all $p<0.05$) correlated with ES as well.

Summary and Conclusion

The distinct endoscopic features of PSC-IBD are confirmed on histologic examination of mucosal biopsies. While our findings support good construct validity for the Nancy Index in PSC-IBD, they also demonstrate that additional histologic features are unique to PSC-IBD. This may warrant development of a PSC-IBD-specific histologic activity index. Clinical activity correlates poorly with NI in PSC-IBD, consistent with past studies showing subclinical inflammation.

Table 1 Histologic features at diagnosis

N (%) or median (IQR)	**PSC-IBD (N=50)**	**Colitis controls (N=81)**	**P-value**
Histologic pancolitis (proximal to hepatic flexure)	37 (82%)	43 (61%)	**0.0185**
Histologic right colon more severe than left	18 (38%)	9 (12%)	**<0.01**
Histologic backwash ileitis	19 (38%)	7 (13%)	**<0.01**
Histologic relative rectal sparing	14 (29%)	10 (13%)	**0.0233**

Table 2 Unadjusted associations between histologic features and ES in PSC-IBD and UC controls

Histologic feature (Left-sided)	**PSC-IBD (OR, 95% CI)**	**P-value**	**Colitis controls (OR, 95% CI)**	**P-value**
Cryptitis	15.0 (3.74-60.4)	**<0.01**	1.56 (0.62-3.91)	0.34
Crypt abscess	5.55 (2.11-14.6)	**<0.01**	1.90 (1.05-3.45)	**0.034**
Ulceration/erosion	15.4 (1.21-196)	**0.035**	2.73 (0.996-7.49)	**0.05**
Surface villiform change	5.32 (1.45-19.5)	**0.012**	1.83 (0.69-4.85)	0.22
Eosinophilia	4.51 (1.31-15.54)	**0.017**	0.53 (0.15-1.92)	0.33
Chronic inflammation	5.73 (2.47-13.3)	**<0.01**	3.18 (1.43-7.09)	**<0.01**
Basal plasmacytosis	27.1 (2.63-279)	**<0.01**	4.05 (0.26-63.1)	0.32

IBD 11

EBV Reactivation in Acute Colitis, A Management Dilemma.

Zainab Ojibara, Sally Buxton, Raj Parmar and Anirban Mukhopadhyay.
Great North Children's Hospital, Newcastle

Introduction
Epstein–Barr Virus (EBV) is one of the most prolific human viruses. It affects people worldwide and has a prevalence of more than 90% in the adult population. Primary EBV childhood infections are often asymptomatic or indistinguishable from other common childhood illnesses. EBV may be reactivated in immunocompromised patients due to its latent characteristics in target cells. IBD patients are at risk through the use of steroids, biologics or both. EBV associated lymphoproliferative disease (LPD) is a feared complication mostly attributed to immunosuppressive agents.

Aim
We present a case of EBV reactivation with the presence of EBV on colonic biopsy and highlight the management dilemmas encountered.

Subjects
A 15-year-old male with proctitis failed to respond to rectal Mesalazine. He had no other significant past medical or family history and was taking no other regular medications. He presented with increasing bloody stools and weight loss. His height was on the 91st centile and weight had fallen from the 91st to the 75th. He was admitted for Methylprednisolone after failing oral steroid treatment. Re-evaluation was undertaken after 3 weeks of steroid treatment.

Results:
Ultrasound showed bowel wall thickening in the sigmoid and descending colon. Limited colonoscopy to the descending colon showed continuous inflammation with contact bleeding and mucopus. Microscopic appearances were in keeping with moderate to severe active chronic colitis. Colonic biopsy was negative for CMV but positive for EBV. Blood sampling showed 20,000 DNA copies of EBV with EBNA antibody detected. EBV IgM was negative and the child had EBV IgG detected at initial diagnosis. There was no evidence of EBV driven lymphoproliferative disorder at that time.
This case was managed jointly with Immunology. Reactivation of latent EBV following a prolonged steroid course was the working diagnosis. The family were keen to proceed to colectomy rather than escalate to Infliximab given the long-term risks of lymphoproliferative disorders.

Summary
This highlights a case of severe colitis with EBV positivity on biopsy when looking for CMV colitis. CMV testing is unavailable independent of EBV in our trust. Our patient had evidence of prior infection therefore the most likely diagnosis was EBV reactivation. Given colectomy was curative in this case, the family elected for this management option.
We have reviewed the literature, which has shown little data in children and no consensus in adults regarding the management of EBV colitis. Immunosuppressive treatments are a significant risk factor for EBV colitis and dose reduction, or cessation can lead to clinical improvement. It is important to exclude lymphoproliferative disease early and ensure understanding of primary infective or reactivated disease. EBV in Crohn's disease will prevent a greater management dilemma, as colectomy will not remove the need for further immunosuppressive treatments.

Conclusion
EBV colitis in children is rare with no management consensus. It is associated with a variety

of presentations and could cause and/or worsen a flare. The use of immunosuppressant treatment inadvertently puts IBD patients at increased risk of viral reactivation. Management should be multidisciplinary with consideration of the long-term risk of lymphoproliferative disease.

IBD 12

Inflammatory bowel disease and chronic granulomatous disease: A case report

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Introduction

Chronic granulomatous disease (CGD) is a primary immunodeficiency disorder of phagocytes and is characterized by severe recurrent bacterial and fungal infections as well as dysregulated inflammatory response resulting in granuloma formation and other inflammatory disorders such as colitis.

Aim

To discuss a case of NCF4-related chronic granulomatous disease initially diagnosed with and managed as Crohn's disease.

Subjects and methods

A 10-year-old boy presented in 2016 with symptoms of diarrhoea, abdominal pain, left panuveitis, gum hypertrophy and ulcers on tongue. He had a background of retinal pigmentary changes presumed to be secondary to previous toxoplasma infection. Faecal calprotectin level was raised at 430 µg/g and tTG IgA levels was 19 U/ml with positive anti-endomysial antibodies. Endoscopy revealed villous atrophy in first part of duodenum, and granulomatous inflammation in the terminal ileum, stomach and colon. His bowel symptoms responded to the initial treatment of exclusive enteral nutrition for Crohn's disease followed by gluten-free diet for coeliac disease. He was commenced on Azathioprine in August 2017 but subsequently developed drug-induced pancreatitis and Azathioprine was stopped. He was started on Pentasa in October 2017. He subsequently developed perianal abscess and perianal fistulas. There was some hesitation in commencing immunosuppressants due to previous history of possible toxoplasma infection. Therefore microbiology advice was sought and further blood tests ruled out active toxoplasma infection. Methotrexate was started in September 2018.

In February 2019, he developed recurrent folliculitis in his groin and thighs. His skin swabs grew staphylococcus aureus and treated with oral antibiotics by dermatology team. Due to ongoing and new perianal fistulas, Infliximab was commenced in July 2019. Patient developed groin abscess in early December 2019 and perianal abscess in mid-December 2019 and required surgical drainage along with intravenous antibiotics on both occasions. He then had a readmission to the hospital in January 2020 for recurrent fevers and recurrent groin abscesses. During this admission his immunosuppression (infliximab, methotrexate) was stopped. Apart from intravenous antibiotics, he was also treated with intravenous voriconazole for possible fungal infection due to yeast on perianal swab and atypical appearance of chest X-ray and CT chest.

Results

In light of the multiple infections, extensive immunology workup was done during the January 2020 admission including a nitro blue tetrazolium test which was normal. Blood test was sent for Very Early Onset Inflammatory Bowel Disease gene panel and the results came back 4 months later showing a diagnosis consistent with NCF4-related chronic granulomatous disease. He was thus referred to the immunology team and is currently awaiting bone marrow transplant.

Conclusion

This case highlights the importance of high clinical suspicion of an alternative diagnosis of immune deficiency in patients with presumed inflammatory bowel disease and recurrent infections. Nitro tetrazolium blue test can be normal in hypomorphic (variant) forms of CGD as in this case. Therefore molecular genetic tests play an important role in accurate diagnosis and disease identification.

IBD 13

Referral , review and scoping timelines in IBD in pandemic , compared to National Quality standards.

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Alderhey Childrens hospital, Liverpool accepts referrals from 8 Hospitals around the region and we get 2-3 new referrals of IBD every week. During the pandemic, we were limited ,like the rest of our country in performing regular endoscopies for a period of 6 months in 2020.During that period, we continued to perform emergency endoscopies for children who presented with acute presentations of IBD. We have in 2021, caught up with those children who needed routine and emergency endoscopies, and we wanted to audit our referral , review and scoping times for our NEW IBD referrals and compare them against the standards set by RCPCH(Quality standards in paediatric Gastroenterology,Hepatology and Nutrition) in 2017 and compare them with our own survey done in 2019.
Methods : We looked at 30 records of children who had a new diagnosis of IBD in last three years and looked at their referral date, date of first review and their date of first scopes. We compared this data with our previous data from the IBD standards benchmarking tool done in 2019

Results : Of the 30, 4 children had a referral earlier than the last three years and were excluded.

12 children were newly diagnosed in 2021 and were referred and seen mostly between 0-4 weeks 91%) with one child seen at 8 weeks(9%); which is much improved from 2019(75%). The median time of review was 2 weeks. The time taken to scope them after the review ranged from 0-12 weeks with a mean of 6 weeks and median of 4 weeks.
In 2020,Of the 9 notes reviewed the time for reviews from referral ranged from 1-8 weeks, the median being 4 weeks , and average being 4 weeks, which is still on target.The time to scope varied depending on if the child presented acutely unwell or not. It varied between 0 weeks to 10 months for children who were reasonably well and were not scoped till a routine date was available. The mean time was 6 weeks, barring the outlier of 10 months.
In 2019, of the 6 notes reviewed showed a range between 2-8 weeks , median being 2 weeks and average of 4 weeks.Of the 6 notes reviewed, the mean was 6 weeks and median 5 weeks. Again there was an outlier at 11 months.

Conclusion and discussion: In early 2020, the country went in to lockdown and routine endoscopy came to a standstill. We struggled to manage new IBD referrals and also importantly to scope children who were not unwell enough to warrant an emergency endoscopy. In 2020, we found some late diagnosis in such children , but we appeared to have caught up with early reviews of all referrals for IBD in 2021.Our IBD standards for diagnosis are on target in 2021 and much better than 2019.

References
Quality standards for Paediatric Gastroenterology,Hepatology and Nutrition Jan 2017 RCPCH Publications.

Liver

L1

An unusual presentation of Gilbert's Syndrome in a neonate

Alice Findlay and Jide Menakaya.

Introduction

Prolonged jaundice is a common clinical presentation, of which the vast majority of children will be found to have a benign unconjugated hyperbilirubinemia. However, a small group of children will be found to have underlying conditions which may need further investigation and management.

Gilbert's syndrome is considered to be a benign condition associated with intermittent and asymptomatic episodes of jaundice secondary to a mild unconjugated hyperbilirubinaemia commonly noted in times of stress, dehydration, or illness. It is not usually noted to cause significant hyperbilirubinaemia, and does not routinely require treatment.

History and presentation

A term 29-day old baby boy presented to Prolonged Jaundice clinic for review and was found to be significantly jaundiced with a bilirubin on blood gas of 617 mmol/litre (and unable to be plotted on the standard NICE bilirubin chart). He was immediately referred to Paediatric A&E where this was confirmed on formal laboratory serum bloods where it was also established that it was mostly unconjugated.

Despite his age, he was started on 5 phototherapy lights and screened for sepsis. On examination, he was clinically well despite the generalised jaundice, with no evidence of encephalopathy or dysmorphic features, and was noted to have pigmented stools. There were no concerns regarding his feeding or growth, nor was there any significant family history of any medical issues and his parents were non-consanguineous.

Treatment and investigation

The bilirubin levels were noted to be responsive to the phototherapy, and so the lights were able to be weaned down relatively quickly, although it was noted that the bilirubin levels would rapidly rise each time the phototherapy was stopped, therefore requiring intermittent treatment with phototherapy.

Fig.1: Graph to show the levels of bilirubin fluctuating during his admission.

A trial of exclusive formula feeds was started, but his bilirubin levels continued to rise without any breastmilk. After discussion with the local tertiary liver centre, he was also started on a regular dose of phenobarbitone.

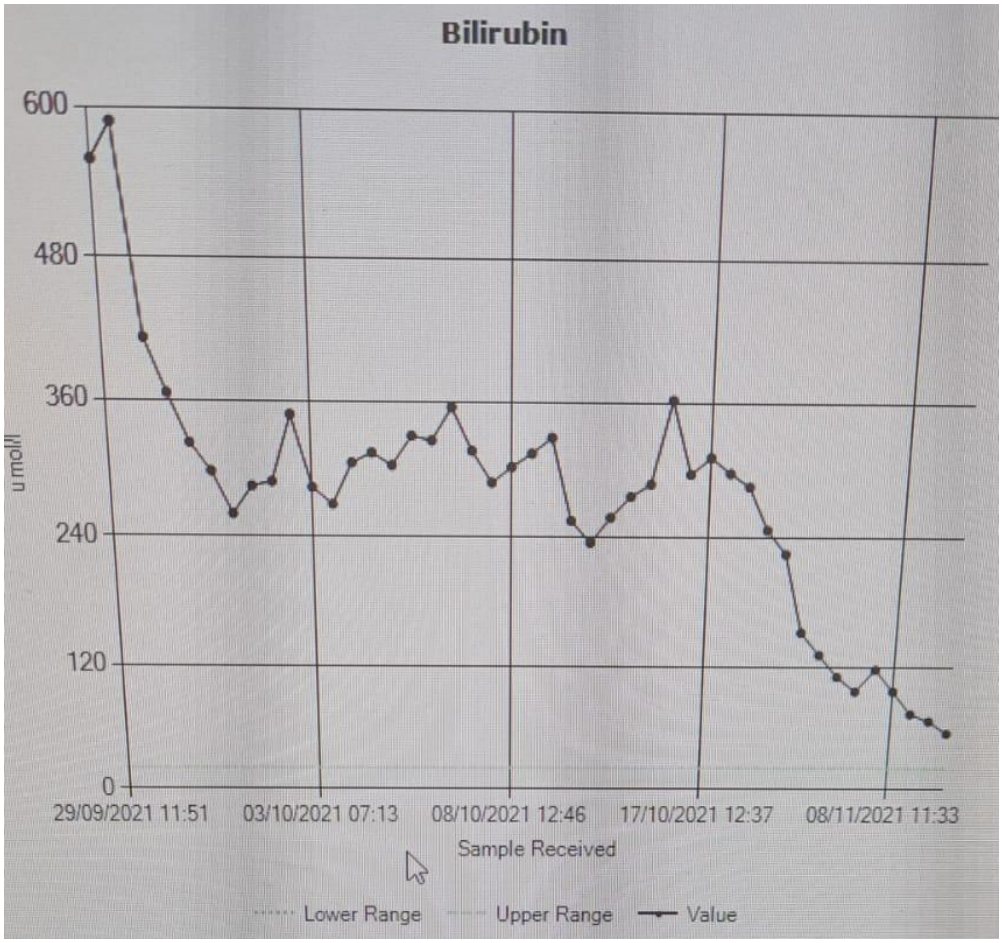
An ultrasound scan of his abdomen showed no abnormality. His other liver function tests were normal, and a screen for G6PD, hepatitis, infections, and other first line tests for unconjugated hyperbilirubinaemia were all normal. Genetic tests were also sent for Criggler-Najjar syndrome and Gilbert's syndrome, for which he was found to be homozygous for the c.-41_-40TA[7] variant in the UGT1A1 promoter which is associated with Gilbert's syndrome.

He has since been discharged from the Neonatal Unit, and remains on home phototherapy to maintain low bilirubin levels whilst long-term management plans can be instigated.

Summary and Conclusion

Despite prolonged jaundice being a common and usually benign presentation, it is important to always consider the causes which may need further investigation and management. Gilbert's syndrome is not usually considered as a cause of prolonged and significant jaundice needing home phototherapy, but we present an unusual cause where no other cause for the persistent hyperbilirubinaemia could be identified. The diagnosis of Gilbert's syndrome must therefore always be suspected when persistent jaundice and raised unconjugated hyperbilirubinemia occur in the absence of other diagnoses.

Fig.1: Graph to show the levels of bilirubin fluctuating during his admission.



L2

Efficacy and Safety Outcomes With Odevixibat in Children With Progressive Familial Intrahepatic Cholestasis Due to Deficiencies in Multidrug Resistance Protein 3 (PFIC Type 3) or Myosin 5B (PFIC Type 6)

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Introduction/background: Progressive familial intrahepatic cholestasis (PFIC) is a group of rare, inherited liver diseases. Initial descriptions of PFIC were primarily based on data from patients with PFIC type 1 (PFIC1) or 2 (PFIC2). However, additional forms of PFIC have been identified. The ongoing, phase 3 PEDFIC 2 study is assessing the effects of odevixibat, an ileal bile acid transporter inhibitor, in patients with any type of PFIC.

Aim: As of a data cut-off date of 4 December 2020, 6 patients with PFIC types other than PFIC1 or PFIC2 had enrolled in PEDFIC 2. Here, we describe efficacy and safety outcomes in this subset of patients, which comprises 5 patients with PFIC type 3 (PFIC3) and 1 with PFIC type 6 (PFIC6).

Subjects and methods: In PEDFIC 2, all patients receive open-label odevixibat 120 µg/kg/day. Assessments include change from baseline in serum bile acids (sBAs), pruritus, hepatic biochemical parameters, growth, and sleep. Patient pruritus and sleep were evaluated twice daily by caregivers using the validated PRUCISION scale. Pruritus responses range from 0 to 4, with higher scores indicating worse symptoms. Other outcomes included proportion with sBA response (ie, sBAs reduced ≥70% or levels ≤70 µmol/L), proportion of positive pruritus assessments (PPAs) at the patient level (ie, pruritus score ≤1 or a ≥1-point drop from baseline), and treatment-emergent adverse events (TEAEs).

Results: Patients with PFIC3 ranged in age from 3.7–13.3 years, and the 1 patient with PFIC6 was 12.8 years old at screening. All 6 patients were ongoing in the study at the data cut-off. Mean (range) exposure was 41 (34−54) weeks for the 5 PFIC3 patients and 54 weeks for the 1 PFIC6 patient. From baseline to last assessment, all patients had reductions in sBAs and all but 1 patient (PFIC3) had reductions in pruritus score. Mean changes from baseline to week 36 in sBAs, pruritus score, growth, sleep parameters, and liver parameters are shown in the Table. Three patients, including 2 with PFIC3 and 1 with PFIC6, met criteria for sBA response at last assessment. Over the interval from weeks 0–36, PPAs in 5 patients with available data were ≥85%. Overall, 5 of 6 patients experienced any TEAE; no patients had serious TEAEs or TEAEs leading to discontinuation.

Summary and conclusion: Patients with PFIC3 or PFIC6 experienced clinical benefits with odevixibat, including reductions in sBAs and improvement in pruritus symptoms, growth, and sleep parameters. Odevixibat treatment was generally well tolerated.

Table. Effects of Odevixibat Treatment in Patients With PFIC3 or PFIC6

	Patients With PFIC Due to MDR3 Deficiency (PFIC3)		Patient With PFIC Due to MYO5B Deficiency (PFIC6)	
Parameter	**Mean (SE) baseline value (n=5)**	**Mean (SE) change from baseline to week 36 (n=4)**	**Baseline value (n=1)**	**Change from baseline to week 36 (n=1)**
Serum bile acids, µmol/L	212 (48)	–91 (37)	169	–78
Pruritus score	2.9 (0.3)	–1.6 (0.4)[a]	2.1	–1.8[a]
Serum ALT, U/L	88 (13)	67 (21)	50	89
Total bilirubin, µmol/L	30 (4)	18 (13)	102	–83
Height Z score	–2.0 (0.5)	0.2 (0.2)	–2.5	0.1
Weight Z score	–1.4 (0.6)	0.1 (0.4)	–1.0	0.5
Days with bleeding associated with scratching, %	18 (14)	6 (6)[a]	0	0[a]
Days needing help falling asleep, %	60 (21)	–29 (24)[a]	21	–21[a]
Days needing soothing, %	59 (20)	–28 (21)[a]	36	–36[a]
Days sleeping with caregiver, %	60 (21)	–27 (22)[a]	0	0[a]

[a]Mean change to weeks 34–36. ALT, alanine aminotransferase; MDR3, multidrug resistance protein 3; MYO5B, myosin 5B; PFIC, progressive familial intrahepatic cholestasis.

Keywords: progressive familial intrahepatic cholestasis, clinical trial, odevixibat, ileal bile acid transporter inhibitor, pruritus, bile acids
Topic: General gastroenterology, general hepatology

Conflict of Interest Declaration

H. Özen and **B. Dalgic:** Nothing to disclose
E. Sokal: Promethera Biosciences – Founder, chairman of the board of directors, and member of the executive committee
F. Lacaille: Alexion – Consultant
Q. Ni, L. Kjems, P. Horn: Albireo – Current or former employment

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L3

Effects on Serum Bile Acids, Pruritus, and Safety With Up to 72 Weeks of Odevixibat Treatment: Pooled Data From the PEDFIC 1 and PEDFIC 2 Studies in Children With Progressive Familial Intrahepatic Cholestasis

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Introduction/background: Progressive familial intrahepatic cholestasis (PFIC) is a group of rare paediatric cholestatic liver diseases. In the phase 3 PEDFIC 1 and PEDFIC 2 studies, the efficacy and safety of odevixibat, an ileal bile acid transporter inhibitor, were examined in patients with PFIC.

Aim: Using pooled data from PEDFIC 1 and PEDFIC 2, we analysed changes in serum bile acids (sBAs) and pruritus and examined the safety profile of odevixibat in patients treated for up to 72 weeks, comparing those who responded to odevixibat treatment (Rs) with nonresponders (NRs).

Subjects and methods: PEDFIC 1 was a 24-week, randomised, placebo-controlled study, and PEDFIC 2 is an ongoing 72 week extension study. This pooled, exploratory analysis spans from patients' first dose of odevixibat to a data cut-off date of 4 December 2020. Patient pruritus was rated using the Albireo observer-reported outcome (ObsRO) instrument. Treatment Rs met either sBA response criteria (defined per the PEDFIC 1 study protocol; Table) or sBA and/or pruritus response criteria (Table). Safety assessments included evaluation of treatment-emergent adverse events (TEAEs).

Results: Overall, 84 patients received odevixibat (mean age, 5.0 years; median odevixibat exposure, 53 weeks). During weeks 0−72, 30/81 (37%) patients were sBA Rs and 49/84 (58%) patients were sBA and/or pruritus Rs. Mean changes in sBA levels from baseline to the last assessment in this analysis period, weeks 70−72, were –230 and −117 µmol/L in sBA Rs and

NRs, respectively. From baseline to the last assessment interval in this analysis period, weeks 61−72, sBA Rs and NRs had mean changes in pruritus score of –2.2 and –0.9, respectively. Additional changes over time in sBAs and pruritus scores in patients meeting either criteria for treatment response are shown in the Table. TEAEs were reported in 87% and 86% of sBA Rs and NRs, respectively, and in 86% and 83% of sBA and/or pruritus Rs and NRs. Two sBA Rs and 2 NRs (or 3 sBA and/or pruritus Rs and 2 NRs) had TEAEs leading to discontinuation.

Summary and conclusion: Patients with PFIC who responded to odevixibat (based on protocol-defined response criteria) had sustained improvements in mean sBAs and pruritus scores over time. sBA Rs had larger improvements in pruritus than sBA NRs; pruritus improvements in those who did not meet sBA R criteria may reflect either perceived treatment effects or patients with a partial sBA R. Odevixibat treatment was generally well tolerated in both Rs and NRs.

L4

Role of sarcopenia in paediatric non-alcoholic fatty liver disease- interim study results

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Background: Obesity has become a major public health issue for developed countries with a third of 9-year olds in the UK now overweight or obese. This has meant a rise in paediatric non-alcoholic fatty liver disease (NAFLD), a term that includes a spectrum of disease from simple steatosis to non-alcoholic steatohepatitis (NASH), to fibrosis and cirrhosis. Sarcopenia is characterized by loss of skeletal muscle mass and is associated with metabolic syndrome, diabetes mellitus, and cardiovascular diseases. Adult studies suggest that sarcopenia is associated with more advanced NASH and/or liver fibrosis in the context of NAFLD.

Aim: The aim of this study is to assess body composition of children with NAFLD and to evaluate associations with histological features, inflammatory profiles, insulin resistance and activity scores. Here we present the interim results from 7 patients.

Methods: Children with a histological diagnosis of NAFLD would have a whole body DXA scan, basic anthropometry, bioelectrical impedance, acoustic radiation force impulse (ARFI) with their ultrasound, enhanced liver fibrosis (ELF) score and routine bloods. They would also answer a physical activity questionnaire (PAQ). Non-parametric tests were used to assess for correlations and differences between groups.

Results: Seven children have completed their assessment (6M:1F). Median for age was 14 years (SD 2.1), weight z-score 2.46 (SD 0.73), height z-score 0.45 (SD 0.82), BMI z-score 2.24 (SD 0.52), waist circumference (WC) z-score 1.87 (0.62), waist to height (Wt/Ht) z-score median 1.8 (SD 0.68).

From the DXA scan: median total fat mass index (FMI) z-score 1.69 (range 0.74 to 2.26), fat-free mass index (FFMI) z-score 0.93 (-0.72 to 1.08). % fat mass median 38.7, (range 25.4% to 46.5%). FMI z-score had a significant negative correlation with cholesterol levels (-0.85)* and positive with WC z-score (0.79)* and Wt/Ht z-score (0.79)*.

The histological fibrosis score had a significant positive correlation with age (-0.82)* and ELF score (0.79)* and significant negative correlation with total body water (-0.9)**, extra-cellular water (-0.85)*, intra-cellular water (-0.89)**, body cell mass (-0.83)*. The NAS score correlated significantly with WC z-score (0.81)*, Wt/Ht z-score (0.81)* and PLTs (0.88)** and negative correlation with ARFI (-0.85)*.

Only 2/7 children had a Wt/Ht ratio below the 80th percentile (the figure shows only the boys) and these 2 children had a low NAS score (of 1) and fibrosis of 0 and 1. They had the lowest platelets (below 250).

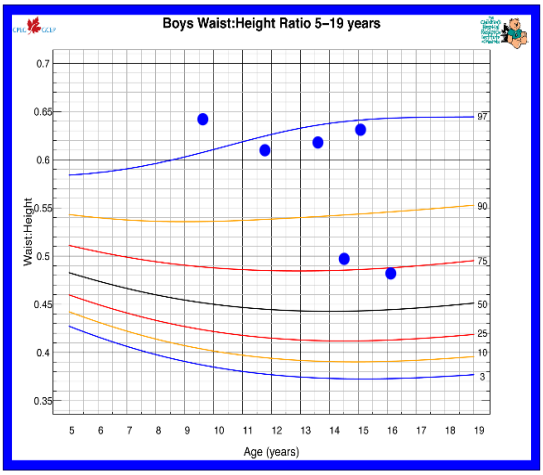
Summary/Conclusion:
Due to the pandemic there have been delays in this study and these are interim results. The aim is for 20 patients to be measured and a cytokine panel will be included in their assessment when all samples have been collected.

Within this data, the degree of fibrosis correlates with BCM, which is a measure of lean mass, but not with total FFMI as per DXA scan. As expected it correlated with ELF score. Whereas

the NAS score, which reflects more the degree of steatohepatitis/inflammation correlated with platelets, waist circumference and waist circumference to height ratio.

This study is being funded by the Children's Liver Disease Foundation

Figure: Waist to Height ratio percentiles for the boys.



P<0.05*, p<0.01**

L5

Sarcopenia in children with liver disease : A pilot study

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Background and aims: Sarcopenia can be defined as loss of muscle mass, strength and function and has been shown to be associated with increased morbidity and mortality in the adult population. Sarcopenia has been assessed by decreased psoas muscle surface area (PMSA) on Computer tomography (CT) and has been validated in paediatric studies. The impact of Sarcopenia in children with end stage liver disease and oncological conditions is now being recognised. There is scarce literature on the effect of sarcopenia on motor function. CT imaging exposes children to radiation and hence is done in a select group of children at the time of transplant assessment. The aim of this audit was to assess the prevalence of Sarcopenia in children undergoing liver transplant assessment and its relationship on laboratory variables, functional activity and clinical outcomes.

Methods: Retrospective single centre case review of patients with liver disease undergoing transplant assessment and CT imaging between 2018-2020. Psoas muscle was analysed at the level of L4/L5. The z-Scores were calculated using age- and gender-specific reference values. Sarcopenia was defined as tPMA z score less than -2. We assessed the relationship of Sarcopenia to the biochemical parameters, nutritional status, effect on motor delay/physical abilities (assessed by a range of age appropriate standardised developmental and physical assessments due to COVID pandemic isolation restrictions) and post-transplant complications.

Results: Thirty one children that met the inclusion criteria were included. Sarcopenia was prevalent in 17 children (6 males: 11 females), with a median age of 3.5 years (SD = 4.9). The common conditions were biliary atresia (n= 11, 35%), hepatoblastoma (n=6, 19%), Autoimmune hepatitis (n=3) etc. Twenty- four patients required additional nutritional support (77% nasogastric feeding, 13% PN and 6% oral supplementation). Mean tPMA z-score was -2.27. Data for the assessment of physical abilities/functional activity was available in 21 children. Impairment of motor skills/physical abilities was overall noted in 14/21 children (67%); 9/13 (69%) in the sarcopenic group (6 significant impairment) vs 5/8 (63%) in non sarcopenic group (4 significant impairment). Sarcopenia was associated with increased complications (27 vs 7, $p = 0.005$) and hypoalbuminaemia ($p=0.01$), but was not statistically significant ($p> 0.05$) for the overall length of stay (total and intensive care).

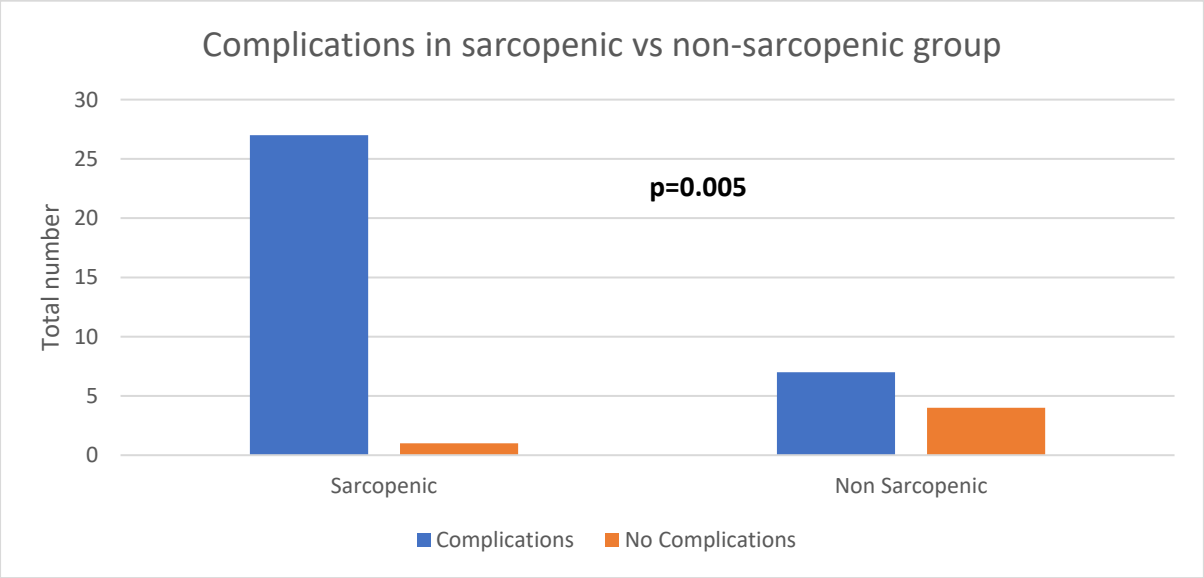
Discussion : Sarcopenia was commonly identified in children with liver diseases undergoing transplant assessment. Reduction in physical abilities/functional activity was observed in both groups which may be a consequence of loss of muscle mass in children secondary to liver diseases or underlying oncological conditions leading to delay in gross motor skills. Although there was no statistical difference in the duration of stay or impairment of motor skills, complications were higher in the sarcopenic group.

Conclusion : In this pilot study, sarcopenia is prevalent in children being assessed for liver transplantation and was associated with increased complications. Better non-invasive methods (aside from CT scan) of assessing sarcopenia needs to be developed and validated

for the paediatric age group, which would help to better characterise the true incidence and prevalence of sarcopenia in children with chronic liver disease. There is a need to offer nutritional support and assess physical function early in the pre transplant period in order to initiate appropriate physiotherapy interventions to halt and even reverse the progression of sarcopenia.

Table 1: Demographics and complications:

	Sarcopenia group (n =17)	Non sarcopenia group (n = 14)	P value
Male : Female	6 : 11	9 : 5	
Weight (kg) / SD	20.3 (18.8)	25.3 (18.9)	0.47
Transplanted : Not transplanted	13 : 1	10:4	
Complications	27	7	0.005
Bile leaks	5	0	
Pleural effusion	4	1	
Rejection	2	0	
AKI	2	1	
Motor delay : No delay	9 : 4	5:3	
Nutrition support : No additional nutritional support	12 : 3	12:2	
Length of stay (Median)	19	22	0.81
PICU days (Median)	4	3	0.90
Albumin (Median)	32	40	0.01
Death	5	0	



L6

Morbidity associated with Primary Hyperoxaluria Type 1 (PH1) following liver transplantation: an aid for counselling of families.

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Introduction
Primary Hyperoxaluria Type 1 (PH1) is a rare inherited metabolic disease frequently resulting in renal failure and multisystem deposition of oxalate. The current curative management is AGT enzyme replacement by liver transplantation with or followed by renal transplant when the systemic oxalate load has reduced. This review is focusses on identifying the morbidity associated with systemic oxalosis following liver transplant with an aim to aid counselling of families and inform clinicians.

Patients and Methods

Twenty-nine patients with PH1 type 1 were cared for in our centre from 1998 to 2021. We are describing 8 patients with systemic oxalosis who had undergone a liver transplant at our centre followed by having or currently awaiting, sequential renal transplant. The patients physical and electronic notes were reviewed and complications identified by systematic enquiry.

Results

Cardiovascular
Cardiovascular morbidity was significant and resulted in a delay of listing for renal transplantation in 2 patients. Vasoplegia developed in the immediate post-transplant period in 2 patients. Both required prolonged inotropic support. One of these patients developed ischaemic bowel and hepatic artery thrombosis resulted in liver failure in the acute post transplantation period requiring an urgent listing for a second liver transplant.

A third patient developed right sided heart failure with diastolic dysfunction secondary to systemic oxalosis and had other manifestations of systemic oxalosis including growth failure requiring parenteral nutrition (PN), recurrent infections, pancytopenia and recurrent hypotension on dialysis and subsequently required palliative care for symptomatic management.

Metabolic Disease

2 patients developed episodes of hyperammonemia following liver transplantation. One patient died due to complications of this and the other patient underwent a combined liver and kidney transplantation which led to a resolution.

Eyes
62.5% of patients had ophthalmology follow up and were found to have retinal oxalate deposition and pigmentation with no effect on visual acuity.

Gastrointestinal system

There were significant concerns about recurrent abdominal pain in at least 3 patients with 2 patients undergoing upper GI endoscopy, which yielded no significant findings.

Two patients developed intestinal failure with PN dependency and hypoalbuminemia. In one of these patients, this led to long term feed intolerance.

Bones
5 patients had at least one pathological fracture. Long bone fractures were the most common type of fractures with 80% of patients having more than 1 pathological long bone fracture.

Pancytopenia
Pancytopenia was also reported in 4 Patients with 75% of patients requiring a bone marrow aspirate which showed no cellular dysplasia but increased bone remodelling.

Conclusion

PH1 is a rare but serious disease where liver transplant followed by renal transplant is the current model of care in our centre. Despite enzyme replacement with liver transplant, systemic oxalosis often continues to cause serious morbidity.

For families undergoing transplantation, counselling regarding the liver transplant is essential but in addition, families should also be informed of the on-going effects of systemic oxalosis in the post-transplant period. Clinicians need a good understanding of the damaging effects of systemic oxalosis on multiple organs despite the efficacy of liver transplant in halting immediate production of oxalate.

L7

Non-invasive markers for predicting hepatic fibrosis in pediatric intestinal failure-associated liver disease (IFALD)

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Background

Intestinal failure associated liver disease (IFALD) is a life-threatening complication of irreversible intestinal failure (IF). With the advent of modern management of IF, clinical manifestations of IFALD (jaundice) are not always evident, but progression of fibrosis resulting in cirrhosis can continue.1 The recognition of IFALD is important as children with progressive IFALD if identified early can have timely interventions (medical/surgical) to halt or reverse the progression of liver disease.

The conventional method of assessment of severity of liver disease is based on invasive measurements like liver biopsy (LBx) for diagnosis of fibrosis. The ideal investigation would be less invasive, can be repeated and reproducible. Indirect assessment of hepatic fibrosis with aspartate aminotransferase (AST)/ alanine aminotransferase (ALT) ratio (AAR), AST-to-platelet ratio index (APRI) and Fib-4 score has been evaluated for other chronic liver diseases e.g.-viral hepatitis. We hypothesized that the non-invasive markers for hepatic fibrosis could be used for assessing the severity of IFALD, thus avoiding the need for LBx.

Aim
To evaluate the accuracy of non-invasive tests (APRI, AAR, Fib-4) compared with LBx findings in grading severity of IFALD.

Materials and Methods

Retrospective audit of 180 patients <18 years with IFALD2 and at least 1 adequate LBx from January 1993-June 2020. Fibrosis stage was assessed using the Ishak score (IS) scored as 0-6 and divided into 2 subgroups according to the histopathologic staging of hepatic fibrosis: mild (IS 1&2) vs. moderate-severe fibrosis (IS-3-6). Categorical variables were described as proportions and quantitative variables were expressed as median with interquartile range. Chi-Square test was used to compare categorical variables and Independent t-test/Mann-Whitney Test was used to find out the association between stage of fibrosis and parameters. The cut off values for APRI, AAR & Fib-4 score were established with liver biopsy as gold standard. The receiver operating curve (ROC) was used for establishing the cut off values. The level of significance was set at $p<0.05$
.
Results
Demographics are as in Table-1. Age, platelet counts, bilirubin, AST, ALT, APRI and AAR were significantly different between the two groups however, multivariate analysis showed that none of the factors independently predicted the presence of moderate-severe fibrosis. As an assessment tool the APRI score seemed to be the most predictive with the area under the ROC of APRI-0.70, AAR-0.63 and Fib-4-0.58. We identified a cut-off value for APRI of 0.72 as the point with the best sensitivity (80%) and specificity (50%) to predict moderate-severe fibrosis.

The limitations of the study is that it is retrospective, management of IFALD and composition

of parenteral nutrition has changed over the last 3 decades and the absence of direct markers and radiological assessment of liver fibrosis for comparison.

Conclusion
Non-invasive markers can identify moderate-severe fibrosis in patients with IFALD. Amongst the various non-invasive tests available, APRI was the most predictive score in assessing the severity. It is possible that the sequential assessment of non-invasive markers may help clinicians to assess progression of liver fibrosis and therefore optimise timely medical/surgical non-transplant management and referral to transplant centre

Table 1: Baseline characteristics of the study subjects

	Total (n=180)	**Mild Fibrosis (n=61)**	**Moderate- Severe fibrosis (n=119)**	**p-value**
Age (years)	2.4 (0.7 – 4.9)	3.8 (1.59 -6.45)	1.5 (0.66—3.8)	0.001
Male	61%	60.5%	67%	0.38
Bilirubin	27 (8 -203)	10 (5 -75)	81 (12 -216)	<0.001
ALT	87 (37 - 206)	51 (27- 142)	118 (48 -219)	0.002
AST	120 (47 -373)	59 (35- 156)	157 (60 -405)	<0.001
GGT	75 (33 – 131)	46 (20-142)	85 (49 -129)	0.023
ALP	641 (371 - 995)	599 (344 -844)	644 (416 – 1052)	0.215
Albumin	35 (31- 40)	35 (29 -41)	35 (31- 39)	0.998
Prothrombin time	12 (12 - 13)	12 (11 - 13)	12 (12- 14)	NS
Platelets	168 (106 -250)	206 (134- 292)	155 (93 – 227)	0.001
APRI	1.72 (0.62 -6.05)	0.79 (0.32 -2.4)	2.56 (0.77 -10.3)	<0.001
FIB4	0.17 (0.09–0.38)	0.12 (0.06 -0.38)	0.19 (0.11 -0.38)	0.091
AST/ALT	1.4 (1.15- 1.99)	1.35 (1.07 -1.75)	1.54 (1.2- 2.11)	0.006

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L8

Acute Liver Failure and Hepatitis Associated Aplastic Anaemia: A 17-year Single Centre Experience

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Introduction/Background:
Hepatitis-associated aplastic anaemia (HAAA) and Acute Liver Failure associated aplastic anaemia (ALF-AA) is a well-recognised but rare disorder with potentially fatal outcome if not treated promptly. The pathogenesis remains unknown. It is characterised by pancytopenia of varying degrees and elevation of aminotransferases. It can result in fulminant liver and or bone marrow failure.

Aim:
To characterise patients who presented with either HAAA or ALF-AA in Leeds Paediatric Liver Unit and assess response to treatment and outcomes.

Subjects and methods:

This was a retrospective study of children who presented to Leeds Paediatric liver Unit with HAAA or ALF-AA between 2004 -2021. All patients had a complete chronic liver disease work up including liver autoantibody screen which was normal. ALF was defined as INR > 2 with or without encephalopathy.

Results:
We identified 18 children (13 male) with median age 10 years (1.5-15.5 years) (Chart 1). 12 children presented with ALF-AA and six with HAAA. Positive Parvovirus B19 PCR was identified in two cases (one case had HHV6 at the same time). In patients who presented with ALF-AA, 10 developed AA after liver dysfunction, in the remaining two children ALF developed concomitantly with AA. In patients who presented with HAAA, AA preceded hepatitis in one patient, four patients developed both at the same time, and one patient developed AA after hepatitis. Average time between liver dysfunction and AA was 7.6 weeks (1 week – 5 months).

In the cohort with ALF-AA (n=12), 9 patients were treated with prednisolone, 6 children achieved normalisation of liver function, although one patient also required tacrolimus. Of those who recovered from liver dysfunction and received steroids (n=6) – two patients needed bone marrow transplant (BMT), two were treated with ATG and the remaining two showed bone marrow recovery. The remaining three patients who did not respond to steroids had a liver transplant (LT) and one required BMT. The three patients with ALF-AA who were not treated with steroids needed LT (2 developed AA post LF; 2 needed BMT and 1 required ATG as well).

Of the patients with HAAA (n=6), two achieved normalisation of ALT and bone marrow recovery with prednisolone. In the remaining four children, hepatitis resolved spontaneously, however 2 children had BMT, one is currently listed for BMT, and the other patient died from pneumonia whilst conditioning for BMT.

In this cohort three patients out of 18 died (one post BMT and LT due to pulmonary haemorrhage, one whilst conditioning for BMT due to pneumonia, one died within a month of presentation of ALF-AA due to E. coli sepsis).

Summary and Conclusion:

In our study there was no associated between the severity of liver dysfunction and AA. There may be a beneficial role of steroids in the recovery of the liver, but not necessarily affecting bone marrow recovery or need for BMT. The clinical course and prognosis of AA is independent of liver dysfunction. Early liaison with Paediatric Haematology is essential.

L9

‘New Kid on the Block’: Progressive Familial Intrahepatic Cholestasis due to NR1H4 gene mutations

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Introduction and Aim: To describe an infant with low GGT cholestasis with certain unique features and throw some light on the expanding genetic spectrum of progressive familial intrahepatic cholestasis (PFIC).

Methods and Results: A 4-month-old infant presented with complaints of jaundice since day 7 of life. The stools were pigmented and there was history of repeated episodes of spontaneous bruising and prolonged bleeding from injection sites following vaccination. He was born to a third-degree consanguineously married couple with no previous history of sibling deaths or liver related illness in the family. The antenatal period was uneventful, the boy had a smooth perinatal transition and weighed 2.8kg at birth. He was also failing to thrive and weighed 3.6kg at 4 months. On examination, he was pale, icteric with ecchymotic spots all over the body. There was firm hepatomegaly along with a palpable spleen. Rest of the systemic examination was unremarkable.

Initial evaluation showed anaemia (hemoglobin- 73g/l), conjugated hyperbilirubinemia (total serum bilirubin- 307.8 µmol/L; direct bilirubin- 195 µmol/L) and deranged liver function tests (aspartate transaminase- 290 IU/L; alanine transaminase- 192 IU/L; alkaline phosphatase- 923 IU/L; total serum protein- 56 g/l; albumin- 35 g/l). The coagulation parameters were also deranged with a prothrombin time of 18 sec (normal 10-12 sec) and an international normalized ratio of 1.7 (normal 0.9-1.1) which persisted even after parenteral vitamin K administration. The gamma glutamyl transferase levels were low (GGT- 22 IU/L). Ultrasonography of the abdomen revealed hepatosplenomegaly with visualized gall bladder and common bile duct. Further work up showed markedly elevated alfafeto protein (AFP) levels (AFP- 130000 U/ml; normal <10 U/ml) on multiple occasions. Urine for succinyl acetone was negative and erythrocyte galactose-1-phosphate uridyl transferase (GALT) enzyme was within normal limits. With the low-normal GGT cholestasis, a possibility of progressive familial intrahepatic cholestasis (PFIC) was considered and genetic analysis was sought. Next generation sequencing a homozygous deletion on chromosome 12 [(c.(109+1_110-1_475+1_476-1) del] involving the exon 1 region of NR1H4 gene.
Summary and Conclusion: The NR1H4 gene encodes for farnesoid x receptor (FXR), which is the nuclear receptor transcription factor regulating bile acid synthesis and BSEP expression. Micro-deletion involving first two exons of this gene has previously been reported in the literature in patients presenting with PFIC phenotype. PFIC resulting from mutations in the genes encoding FXR is termed PFIC-5, which is very rare and only eight cases have been reported in literature till date. It shares some similarities with the PFIC type 2 and is characterised by early onset cholestasis, markedly elevated AFP, hyperammonemia and vitamin K independent coagulopathy; all the features which were seen in the index case. Progression to cirrhosis and end stage liver disease can be rapid.

Nutrition

N1

Nutritional Support Is Required in the Majority of Patients with CHARGE Syndrome: 10-year Data from a Single Tertiary Centre

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Introduction
CHARGE syndrome is a rare genetic disorder, caused in more than half of cases by mutations in the CHD7 gene. CHARGE is an acronym for the clinical features common in this condition- Coloboma of the eye, Heart defects, Atresia of the choanae, Restriction of growth and development, Genito-urinary abnormalities, and Ear abnormalities and deafness. #

Gastrointestinal (GI) symptoms, feeding difficulties and growth restriction are known to be highly prevalent in patients with CHARGE syndrome. We describe our experience with children diagnosed with CHARGE syndrome over a 10-year period in our tertiary paediatric gastroenterology unit.

Subjects and Methods

We reviewed case notes of patients with CHARGE syndrome managed in our hospital from 1 January 2010 to 31 July 2021. Patients were identified based on a diagnosis of CHARGE syndrome by genetic or clinical criteria.

Results
Sixteen patients were included in the study. 11 patients (69%) were female. No deaths were recorded. Median age of patients at the time of review was 10.3 years (range 0.9- 15.8 years). Eleven patients had confirmed CHD7 gene mutations, the remainder were diagnosed clinically.

Clinical features in our patient cohort are described in Table 1
Most patients had feeding difficulties, with 14 patients (88%) requiring a period of enteral feeding support in the form of gastric feeding (n=14) and also jejunal feeding (n=4). One patient required five months of parenteral nutrition due to vomiting, recurrent aspiration events on feeds and faltering growth. At last review, six patients had been completely established on oral feeds, while the remainder still required enteral feeding support.

Gastro-oesophageal reflux disease (GORD) was diagnosed in 11/16 patients (69%). Of these, seven patients underwent pH/impedance study; three patients had evidence of GORD while the remainder had normal studies. Three patients underwent upper gastrointestinal endoscopy; all had normal results.

In terms of surgical interventions, ten patients (63%) had percutaneous endoscopic gastrostomy (PEG) insertion; two patients also underwent fundoplication. One patient had a percutaneous endoscopic gastrostomy-jejunostomy (PEG-J) insertion and one had a Roux-en-Y jejunostomy. One patient underwent oesophageal gastric disconnection surgery at the age of two years due to persistent retching and vomiting. Post-surgery, vomiting improved however the patient continued to retch.

Conclusion

CHARGE syndrome can vary widely in severity; our cohort represents the more severely affected patients requiring intensive tertiary care input. Our study highlights the complexity of care and importance of multi-disciplinary input for these patients. Feeding issues are common

in patients with CHARGE syndrome and many patients with CHARGE syndrome will require long-term enteral feeding support. Individual treatment plans should include an ongoing evaluation of gastrointestinal and feeding problems as part of the standard of care, to reduce morbidity and improve quality of life.

Clinical features in our patient cohort are described in Table 1:

Clinical Feature	**Frequency in Cohort (%)**
Gastrointestinal	
Feeding difficulties	14/16 (88%)
Gastro-oesophageal reflux disease	11/16 (69%)
Constipation	3/16 (19%)
Unsafe swallow	8/16 (50%)
Other Features	
Choanal atresia	7/16 (44%)
Coloboma	13/16 (81%)
Hearing defects	16/16 (100%)
Cardiac anomalies	14/16 (88%)
Endocrine issues	7/16 (30%)
Developmental delay	7/16 (44%)
Requirement for Tracheostomy ventilation	5/16 (31%)

N2

Streamlining Referrals to The Neurodisability Feeding Clinic at Alder Hey Children's Hospital

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Introduction
Approximately 50% of children with neurodevelopmental problems experience challenges with feeding. Managing these children and their families presents a unique opportunity to offer a single point of care in an outpatient setting. Here, they can be reviewed by multiple professionals in a single appointment. This will include assessment, examination, investigations and initiation of management plans during one point of contact. At Alder Hey Children's Hospital, the Neurodisability Feeding Clinic aims to deliver a 'One Stop Clinic', consisting of a paediatric gastroenterologist, speech and language therapist and specialist dietician. Patients and their families can meet all relevant specialists in one setting. There is currently a 5-6 month waiting time, due to high demand.

Objective/Aim
This quality improvement project aimed to streamline this service, improve waiting times and patient experience. It will ensure appropriate patients are selected for this specialist clinic, are reviewed in a timely manner and provide this 'One Stop Clinic' to offer the right advice and intervention.

Method
Patients were identified using electronic records of referrals to the clinic over a six-month period. The referral was reviewed and assessed to understand the reason for referral to the clinic, prior interventions and whether an alternative pathway would be more beneficial for the patient.

Results
Over six months, 33 new patient appointments were offered, 18 appointments were attended. 5 were not attended and 10 were cancelled. Reason for referral included: assessment of feeding device (28), faltering growth (12), unsafe swallow (9), feed intolerance (2), oral aversion/food refusal (6) and symptoms of vomiting/reflux and retching (8). Problematic symptoms included vomiting (7) and retching (4). These patients had multiple co-morbidities including prematurity (9), significant genetic abnormalities (12), epilepsy (10), known dysmotility/feed intolerance (1), cerebral palsy (9), and global developmental delay (23). Only 4 patients had full investigation for faltering growth, 6 had contrast studies and 12 with growth parameter monitoring prior to referral. Interventions prior to referral included dietetic input (20), specialist formula (1 type [13] and >1 type [4]), nasogastric/nasojejunal feeding (8), gastrostomy (7) and anti-reflux medication (7).

Summary
The Neurodisability Feeding Clinic is an important service for children with complex needs. This clinic requires improvement to ensure that attendance is optimised, and children and their families are accessing the correct service in a timely manner. Referrals to the clinic requires a pathway to ensure the correct information is provided to the service prior to the appointment, and that simple interventions or investigations are completed prior to the appointment where necessary.

Conclusion/Outcomes:
We have introduced a referral proforma to clinic to ensure all information pertinent to the clinic

is available. This proforma provides recommendations of interventions and investigations prior to clinic. We have sent out a parent questionnaire and feeding diary to facilitate a better understanding of the challenges experienced and to manage family expectations in clinic. We are currently arranging additional administrative support to contact families prior to clinic appointments, thereby improving attendance and providing support/advice if they are facing difficulty attending clinic.

N3

Assessing the impact of the COVID-19 pandemic on inpatient admissions and management of patients with Anorexia Nervosa within a single Tertiary Paediatric Gastroenterology Department

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University Hospitals Bristol and Weston Foundation Trust

Introduction/Background:

Anorexia Nervosa has the highest mortality rate of any psychiatric condition. During the COVID-19 pandemic, the prevalence of many psychiatric conditions was observed to increase worldwide. Eating Disorder charities reported unprecedented demand for their services. In addition, there has been a shortage of specialist Tier 4 Eating Disorder beds nationally with many units closing during the pandemic. For young people, the COVID-19 lockdowns led to social isolation, increased academic pressures and increased stress in their home environment – described by many as a 'perfect storm' for deterioration of mental health.

Aim:
This retrospective study aimed to analyse inpatient admissions with Anorexia Nervosa and their management under the Gastroenterology team at the Bristol Royal Hospital for Children (BRHC) pre and during the COVID – 19 pandemic over a 3-year period, from June 2018 to June 2021.

Subject and Methods:

All inpatients with anorexia nervosa under 18 years admitted to BRHC were identified using the Trust diagnostic code F50, F50.1. Patient electronic records were individually reviewed to include only those admitted directly for anorexia nervosa management, and collate admission details including length of stay, specific management and discharge destination.

Results:
80 patients fulfilled the search criteria. 96% patients were female, with an average age of 13.7 years.

There was an increase in number of admissions and length of hospital stay (LOS) in 2020/2021 compared to 2019/2020 and 2018/2019 (Fig.1). Admissions during the COVID-19 pandemic (June 2020 – May 2021) increased by 60% compared with 2019/2020, although only 27% higher than in 2018-19. Length of stay increased by 54% from the 2019/2020 and by 41% from 2018-2019.

The average daily number of inpatients between November 2020 to February 2021 was up to ten times higher than the same period in the previous two years (Fig. 2).

There was a three-fold increase (10.5%, 2020/2021 compared with 3.3%, 2018/2019) in proportion of patients requiring mental health section in order to provide lifesaving weight restoring treatment compared to 2018/2019. An increased number of patients required NG feeding and psychiatric medications. A higher nursing ratio of up to 6:1 was required for patients needing physical restraint for feeding and controlling excessive exercising. No patients required these measures in 2019-2020.

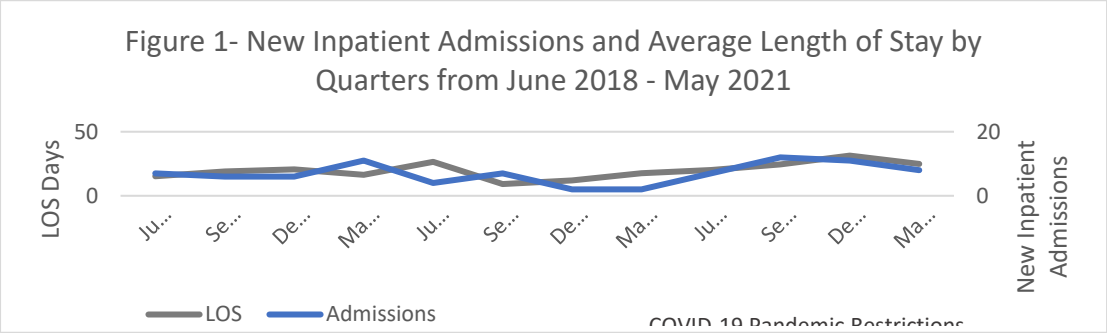
Percentage of patients admitted to specialist Tier 4 eating disorder (ED) units dropped in 2020/2021 compared to previous 2 years, despite an increase in complexity and severity of

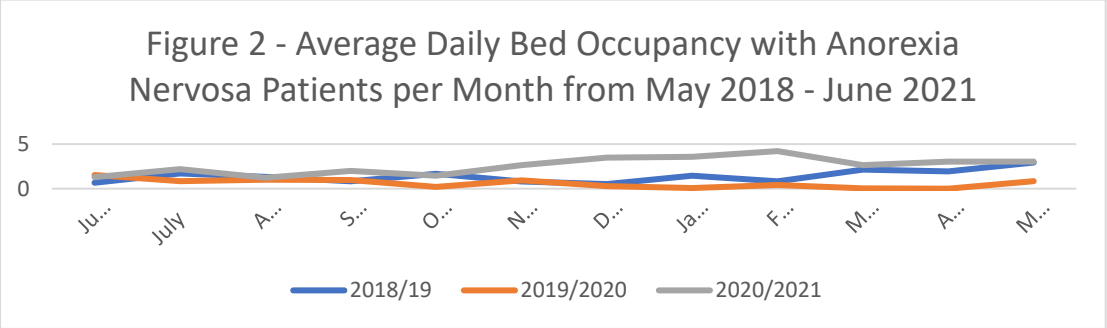
illness.

Summary and Conclusion:

This study has demonstrated an increase in number of inpatient admissions for patients with Anorexia Nervosa at a single centre over the past year. A national shortage in specialised Tier 4 ED beds has also likely contributed to increase in patient volume, length of stay and requirement for more intensive management, placing a greater demand on hospital resources.

It is recognised that there is an increasing number of patients presenting with Anorexia Nervosa. The observed trend of patients with increased complexity and severity, delay in presentation and prolonged hospital stay is likely to have been influenced by COVID-19 pandemic.





N4

Compliance with gluten free diet and TTG values in children with coeliac disease diagnosed on serology compared to duodenal biopsy: a single centre experience

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Royal Manchester Children's Hospital, MFT

Background
Coeliac disease (CD) is an immune-mediated systemic disorder induced in genetically susceptible individuals by gluten and related prolamines, resulting in various gastrointestinal (GI) and non-GI symptoms and signs (ESPGHAN, 2012). CD-specific antibodies (including anti-TTG and endomysial antiobodies (EMA)) are present. Enteropathy with villous atrophy, crypt hyperplasia and intraepithelial lymphocytes are found on duodenal biopsy (ESPGHAN 2012). Treatment is lifelong gluten-free diet (GFD). Global prevalence is around 1% (Hall, 2020), however 50-90% may be undiagnosed in the community (Goddard, 2006). ESPGHAN guidelines (ESPGHAN, 2020) allow CD to be diagnosed on bloods alone if TTG-IgA is greater than 10 times the upper limit of normal with positive EMA in a second sample.

Aim
Children with CD in our tertiary centre were evaluated to compare perceived compliance with GFD and TTG values between groups diagnosed on bloods and on biopsy. We hypothesised that GFD compliance differs between those diagnosed on bloods versus biopsy.

Subjects and Methods

173 children were identified via the dietetic CD database diagnosed between 2006 – 2021 (64 male, 109 female). 69 were excluded (52 as incomplete compliance data or repeat TTG not available, 17 as diagnosis was too recent for repeat serology).

Results
21 patients were diagnosed on bloods. 18 met criteria for no-biopsy approach. Age at diagnosis ranged from 11 months to 14 years. 3 did not meet no-biopsy criteria. 19/21 were symptomatic (90%) - 13/21 (61%) GI symptoms, 4/21 iron deficiency anaemia. 10 had other co-morbidities which include cow's milk and egg allergy and asthma.

15/21 (71%) reported good compliance, 6/15 (40%) had normal tTG, 9/15 (60%) children still had raised TTG. Of these 6 were within 2 years of diagnosis and 5/6 had declining TTGs (73% normal or declining TTG). 6/21 (28%) reported issues with compliance. Of these 5 had raised TTGs, 1 had normal TTG. 19 children were symptomatic at diagnosis; 14 reported good compliance and one asymptomatic at diagnosis had a normal repeat TTG.

83 patients were diagnosed on biopsy. Age at diagnosis ranged from 14 months – 16 years. 74/83 (89%) were symptomatic - 63/83 (75%) GI symptoms, iron deficiency anaemia and growth faltering. 11 had other comorbidities.

62/83 (74%) reported good compliance, 47/62 (75%) had TTG within normal range. 20/83 (24%) reported issues. 15/20 (75%) had raised TTG. 55/74 symptomatic children reported good compliance. 1/5 asymptomatic children had normal repeat TTG, 4/5 had raised TTGs.

Summary and Conclusion

Reported compliance is similar between groups. 40% diagnosed on bloods reported good compliance with normal TTG (73% normal or declining within 2 years of diagnosis) compared

to 75% diagnosed on biopsy. Reported issues with compliance were similar between groups (issues at nursery and school, not liking the taste of gluten free food, accidental exposure, taking 'may contain' products, and not avoiding all gluten sources). Understanding may be different between groups. Both groups had equal access to dietitians. The bloods group should be re-evaluated further from diagnosis and to capture more children diagnosed on bloods. Qualitative work exploring understanding and compliance may be useful.

N5

A systematic review of the benefits and complications of the blended diet for enteral tube feeding in young people

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Background: Interest and use of blended diets (BD) for young people who are tube fed has significantly increased in the last decade, driven primarily by the desires and perceptions of highly motivated caregivers. With wider use in practice, new and increasing literature has emerged on clinical outcomes that may support this practice for health professionals.

Objective: To identify, appraise and synthesise the best available evidence on the benefits and complications of the BD versus commercial feeds for enteral tube feeding in young people.

Methods: A systematic review was carried out from December 2020 to June 2021 in line with PRISMA- P guidance and registered with PROSPERO (CRD42021229453). Searches were conducted of PubMed, Embase, CINAHL, Scopus and Cochrane in accordance with a PICO approach without limitation on year of publication. The search strategy included blended diet OR blenderized diet OR blended OR blenderized OR Pureed OR real food OR liquidized OR liquidised AND enteral OR tube OR gastrostomy OR PEG OR G-tube OR nasogastric OR NG. Inclusion criteria for the review were (1) English language, (2) studies including children, (3) original research from interventional and observational studies and (4) examination of outcomes. Exclusion criteria were (1) unoriginal research or case reports, (2) studies that focus on management of feeding, preparations or attitudes and (3) studies that compare commercial blends only. Data was synthesised using a formal narrative synthesis approach in keeping with the four-element framework by Popay et al, using the Mixed Methods Appraisal Tool (MMAT) and A MeaSurement Tool to Assess systematic Reviews (AMSTAR 2) in appraisal.

Results: 629 database results were identified. Following screening, 53 were sought for retrieval. Full text article review revealed 6 eligible for inclusion involving 226 participants (age range 9 months - 26 years). Study type varied and included cohort, prospective interventional and retrospective. 5 studies reported differences in GI symptoms (n=181). 3 studies reported changes in medication use (n=78). 5 studies reported on growth outcomes (n=148). 3 studies specifically reported complications or adverse events (n=9). The studies varied to an extent that deems them collectively unsuitable for meta-analysis or other pooled quantitative statistical analysis. However, the available literature indicates towards positive outcomes, particularly in the area of gastrointestinal symptom control with few reports of mild adverse events in the included studies.

Conclusion: There is a paucity of data in this area and much heterogeneity in included studies. This is an important and highly clinically relevant topic and more primary research, ideally using core outcome sets to standardise reporting, is required to answer the key questions.

Exhibitors

Takeda

Orphalan

Coloplast