

**Abstract P324 Figure 1** MNBI is reduced in Barrett's (regardless of PPI use) compared to NERD and FH Median and IQR for the MNBI of: patients with Barrett's off PPIs 406Ω (368Ω, 1111.5Ω); Barrett's on PPIs 453Ω (261.5Ω, 1000Ω); NERD 1160Ω (964.5Ω, 2764Ω) and FH 3355Ω (2866.5Ω, 3809.25Ω)

patients studied off PPI ( $p=0.97$  figure 1). There was no difference in MNBI between the 10 patients with persistent (>3 cm) Barrett's who had attempts at therapy (ablation, mucosal resection) compared to the 27 who had not received therapy ( $p=0.96$ ).

There was a moderately inverse correlation between Barrett's segment length (median 5 cm (3 cm, 9 cm) and MNBI ( $r = -0.436$ ;  $p=0.038$ ).

**Conclusion** This study suggests that the impact of reflux disease on mucosal permeability (MNBI) may have an influence on symptom perception. Both MNBI and symptom perception were significantly reduced in Barrett's compared to NERD. Furthermore, neither MNBI nor symptom perception are affected by use of acid reducing medication despite the difference in AET. This study provides further validation to the Lyon consensus definition of MNBI as a measure of reflux disease severity.

P325

### AN EXPANDED INTESTINAL INTRAEPITHELIAL LYMPHOCYTE COMPARTMENT IS LINKED TO SHIFTS IN COMPOSITION OF MUCOSAL MICROBIOTA

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**Introduction** The composition of bacteria colonising the gastrointestinal tract shapes mucosal and systemic immune responses and impacts susceptibility to different diseases. However, a consistent microbiome signature of Irritable Bowel Syndrome (IBS) has yet to be established, and the microbiome was not altered in a large, population-based study of IBS<sup>1</sup>. Since it has been proposed that immune activation and subtle intestinal inflammation may be present in a subset of IBS<sup>2</sup>, we

hypothesised that alterations in the gut microbiome may underpin changes in gut immune phenotype.

**Methods** The study population comprised IBS cases and controls (defined by modified Rome III criteria) from the PopCol study<sup>1</sup>. All participants had a normal colonoscopy. Biopsies were taken from the terminal ileum (TI), caecum, transverse colon (TC), sigmoid and rectum (Re). Assessment of histology was blinded and dual read, and disagreement was resolved by consensus. Intraepithelial lymphocyte (IEL) counts were dichotomised: high IEL count was defined as >15 per 100 enterocytes in TI and >8 per 100 colonocytes in the colon. Colonic mucosa-associated microbiota (MaM) and faecal microbiota (FM) were characterised by 16S rRNA sequencing on Illumina MiSeq. Data were processed and analysed in R, Graphpad & STAMP, with p value correction for multiple testing.

**Results** 76 participants (including 30 with IBS) were analysed, in whom IEL and microbiome data were available. The median age was 50 years (range 23–69) and 40 (53%) were women. 55% of TI samples and between 39% (Re) and 51% (TC) of samples from colonic sites had a high IEL count. No difference was observed in alpha diversity of MaM or FM based on IEL count. There were trends towards differences in beta diversity of the MaM according to IEL count in the TI and TC ( $p=0.079$  &  $0.072$ ). No difference in FM beta diversity was observed. In the MaM, the genus *Blautia* and *unclassified Clostridiales* were associated with high IEL count in the TI ( $p=0.024$  &  $0.036$ ). *Alloprevotella* was associated with low IEL count in the sigmoid ( $p=0.035$ ).

**Conclusions** In this nested analysis of participants in the PopCol study, modest but discernible differences in the mucosa-associated microbiota were seen according to IEL count.

### REFERENCES

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- Burns G. *Am J Gastroenterol* 2019 Mar; **114**(3):429–436.

P326

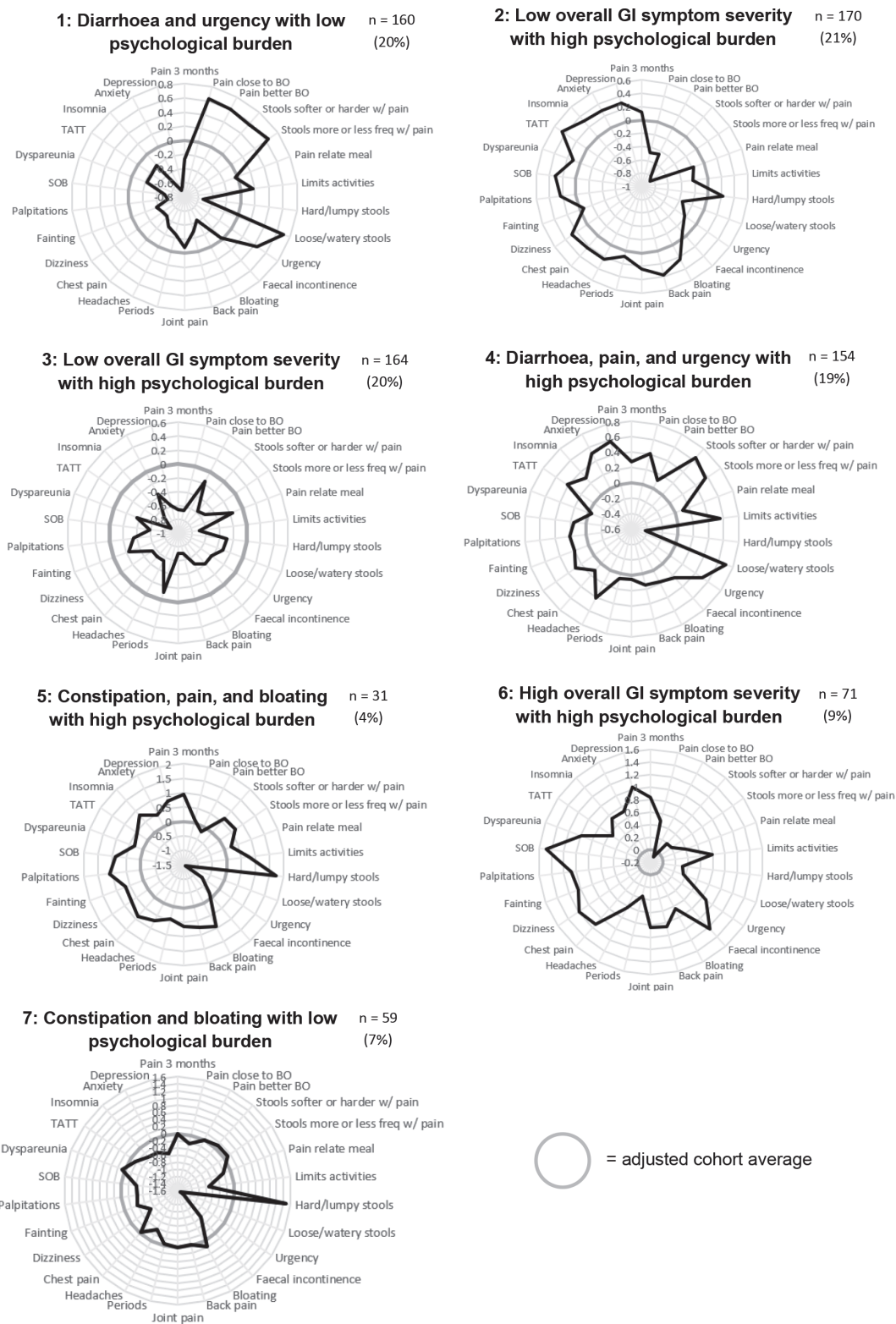
### IDENTIFICATION OF NOVEL SUBGROUPS IN IRRITABLE BOWEL SYNDROME USING LATENT CLASS ANALYSIS: BEYOND STOOL FORM

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**Introduction** Conventionally, patients with irritable bowel syndrome (IBS) are divided into subgroups based on their predominant stool pattern, either diarrhoea, constipation, or mixed stool form. However, factors other than gastrointestinal symptoms, such as psychological co-morbidities, are also highly relevant to IBS symptomatology. We explored alternative approaches to subgrouping people with IBS by incorporating factors beyond stool form alone.

**Methods** We collected demographic, symptom, mood, and psychological health data from 1375 adult subjects in the UK community who self-identified as having IBS, and identified two cohorts meeting either the Rome III or the Rome IV diagnostic criteria. In each cohort, we performed latent class analysis, a method of cluster modelling, to identify specific subgroups (clusters) within the data. We used the Bayesian information criterion (BIC) to determine the preferred model;



Abstract 326 Figure 1 Results of cluster modelling in people with Rome IV-defined IBS

the lowest value indicates the solution which best fits the data. We validated the model using 10-fold cross-validation. Finally, for each cluster, we drew a radar plot by plotting z-values for each variable, calculated by adjusting the cluster mean value to the cohort mean value. We compared the radar plots by visual inspection to describe the particular characteristics of each cluster.

**Results** In total, 1080 (78.9%) of 1368 individuals met the Rome III criteria for IBS, and 811 (59.1%) of 1373 individuals met the Rome IV criteria for IBS. In both the Rome III and Rome IV cohorts, latent class analysis selected a 7-cluster model as the optimum solution, having the lowest BIC value. The clusters were defined by a mixture of gastrointestinal symptoms, non-gastrointestinal symptoms (somatisation),

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anxiety, and low mood. Visual inspection of the radar plots showed that the characteristics of these clusters were identical between the Rome III and Rome IV analyses. The Rome IV cluster results and their descriptions are shown in figure 1. Further analysis, showed that the proportion of patients with severe IBS symptom scores, high levels of perceived stress, and high levels of gastrointestinal-specific symptom anxiety was significantly higher in clusters with high psychological comorbidity ( $p < 0.001$ ).

**Conclusions** Latent class analysis identifies seven distinct IBS subgroups characterised by a mixture of gastrointestinal symptoms, somatoform symptoms, and psychological co-morbidity. Further research is needed to assess the durability and stability of these subgroups over time, and whether they might be used to direct treatment.

**P327 MODULATING HUMAN CORTICAL SWALLOWING FUNCTION BY CONDITIONING THE BRAIN WITH REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION**

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**Background** Various repetitive transcranial magnetic stimulation (rTMS) paradigms have been suggested as treatments for neurogenic dysphagia. However, there is no consensus as to what is the optimal paradigm for improving swallowing function. Moreover, the response to rTMS varies across individuals (NGM 2019, 31(7), e13612), which may be attributed to the preceding brain state. Our contention was that preconditioning human pharyngeal motor cortex with rTMS could stabilize and modify swallowing performance induced by brain stimulation.

**Aim** To compare the effects of preconditioned versus sham-preconditioned rTMS on swallowing performance.

**Material and Methods** Ten healthy volunteers (age=27±2 years; 6 males) were randomised to receive 4 conditions of combined 1Hz (inhibitory) and 5Hz (excitatory) rTMS: i. sham 1Hz immediately followed by active 5Hz (s1-0-5); ii. active 1Hz followed by 5Hz after 30 minutes (1-30-5); iii. sham 5Hz immediately followed by active 1Hz (s5-0-1); and iv. active 5Hz followed by 1Hz after 90 minutes (5-90-1). Both 1 and 5Hz rTMS paradigms were applied over the

pharyngeal motor cortex of the 'dominant' hemisphere. Changes in swallowing reaction times and accuracy were determined, every 15 minutes from baseline to 60 minutes post-rTMS, and analysed using ANOVA.

**Results** Preconditioned 5Hz rTMS (1-30-5) enhanced swallowing accuracy when compared to the sham-preconditioned protocol (s1-0-5) ( $F[1,9]=16.144$ ;  $p=0.003$ ) (figure 1A). Significant improvement was mainly observed at 15 minutes post-rTMS ( $p=0.049$ ). Similarly, preconditioned 1Hz rTMS (5-90-1) reduced swallowing accuracy when compared to the sham-preconditioned protocol (s5-0-1) ( $F[1,9]=10.411$ ;  $p=0.01$ ) (figure 1B). Unlike preconditioned 5Hz rTMS, the changes in swallowing accuracy were not significant at any specific time point. There were no significant changes in swallowing reaction times across any of the conditions.

**Conclusions** Preconditioning human pharyngeal motor cortex with additional rTMS can robustly modify human swallowing behaviour. Future studies should explore the therapeutic role of preconditioned rTMS as a more effective protocol for dysphagia.

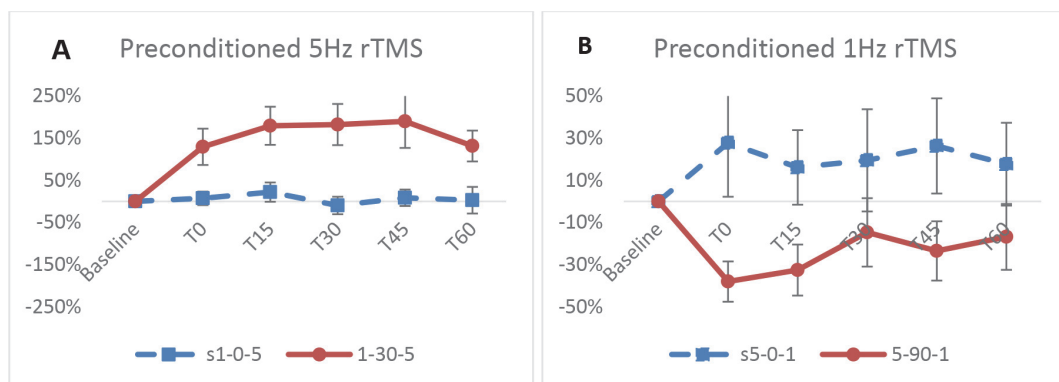
**P328 PSYCHOLOGICAL NEED IN PATIENTS WITH IRRITABLE BOWEL SYNDROME IN SECONDARY CARE**

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**Introduction** Irritable bowel syndrome (IBS) affects 17% of the UK population. Most treatments focus on managing the physical symptoms, however, IBS is associated with a wide range of psychological factors. The aim of this study was to investigate the psychological needs and prevalence of anxiety and depression in an IBS population referred to the gastroenterology dietitian in secondary care.

**Methods** A cross-sectional survey was conducted in August 2019. Patients with IBS attending the gastroenterology dietetic outpatient clinics completed a questionnaire comprising the following validated tools: the Patient Health Questionnaire (PHQ9), Generalised Anxiety Disorder Assessment (GAD7), Work and Social Adjustment Scale (WSAS), IBS Quality of Life (IBS-QoL) and Gastrointestinal Symptom Rating Scale (GSRS). Patients with other gut co-morbidities were excluded. Descriptive statistics and correlations were completed using SPSS.



**Abstract 327 Figure 1** A. Changes in swallowing accuracy after preconditioned 5Hz rTMS compared to sham-preconditioned rTMS. B. Changes in swallowing accuracy after preconditioned 1Hz rTMS compared to sham-preconditioned rTMS.