

## Neurogastroenterology

**P323** OGG-CI COMPLEMENTS REFLUX DISEASE SEVERITY AND GIVES INSIGHT INTO THE PATHOPHYSIOLOGY OF REFLUX IN BARRETT'S

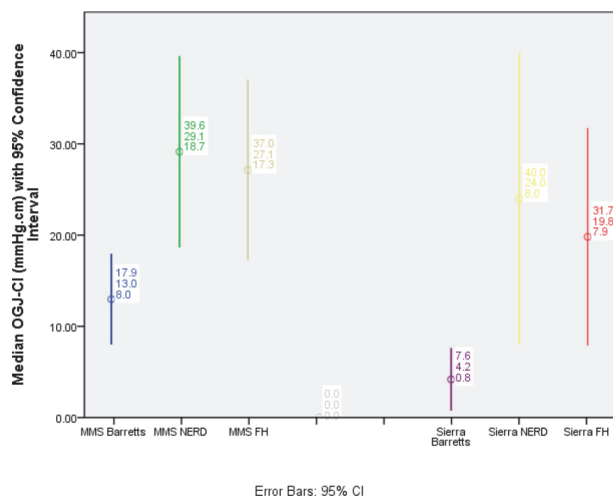
Humayra Abdul-Razakq\*, Amanda Raeburn, Kalp Patel, Oluyemi Femi-Ayeni, Andres Vales, Anton Emmanuel, Natalia Zarate, Rami Sweis. *University College London Hospital, London, UK*

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**Introduction** Oesophagogastric junction contractile integral (OGJ-CI) is a novel parameter that assesses barrier function during high resolution manometry (HRM); however it has not yet come into routine clinical use. We assessed OGJ-CI values across three common presentations of reflux; Barrett's oesophagus, NERD and functional heartburn (FH), to determine how OGJ-CI complements disease severity. Analysis was replicated across 2 common HRM systems and catheter types in consecutive patients.

**Methods** Consecutive HRM studies between 2014 and 2020 were collected from a tertiary referral unit in London; 63 patients (21 Barrett's, NERD and FH each) used a water-perfused catheter (Medical Measurement System, Netherlands) and 48 patients (16 Barrett's, NERD and FH each) used a solid state catheter (Sierra Scientific Instruments, USA). OGJ-CI was calculated using the distal contractile integral (DCI) tool over 3 respiration cycles at 30 mmHg isobaric contour. DCI of the oesophageal body was used as a measure of peristaltic effectiveness. Manometry was followed by 24 hour catheter-based pH monitoring to measure acid exposure time (AET) and is presented as (median; interquartile range).

**Results** AET was greatest in patients with Barrett's (14%; 5.8–23.6%) followed by NERD (9.3%; 5.8–13.6%) and FH (1.9%; 0.8–2.8%) ( $p < 0.0001$ ). Similar OGJ-CI and DCI pressure trends were seen across both manometry systems and catheter types. There was no statistical difference in OGJ-CI between NERD and FH (Sierra  $p = 0.9$ ; MMS  $p = 0.614$ ). On the other hand, OGJ-CI was significantly lower in patients with Barrett's compared to NERD and FH (Sierra:  $p = 0.014$ ; MMS:  $p = 0.017$ ) (figure 1).



**Abstract P323 Figure 1** OGG-CI across 3 presentations of reflux, using MMS and Sierra

Similarly, DCI was higher in NERD (Sierra 659 mmHg.s.cm; MMS 588 mmHg.s.cm) and FH (Sierra 1202 mmHg.s.cm; MMS 736 mmHg.s.cm) (Sierra  $p = 0.032$ ; MMS  $p = 0.414$ ), while in Barrett's, DCI was significantly lower (Sierra 417 mmHg.s.cm; MMS 198 mmHg.s.cm) (Sierra  $p = 0.002$ ; MMS  $p < 0.0001$ ). A weak negative correlation was observed between Barrett's length and OGJ-CI ( $r = -0.18$ ,  $p = 0.5$ ).

**Conclusion** OGJ-CI correlates well with acid reflux burden but the mechanism differs between reflux disease states; OGJ-CI integrity is the same between NERD and FH but markedly reduced in Barrett's. The same pattern is replicated with DCI as a measure of peristaltic effectiveness. This pattern is similar across two of the most commonly used HRM systems and is independent of catheter characteristics. This study suggests that in Barrett's, disruption of OGJ anatomy may result in an increased volume of reflux compounded by reduced peristalsis effectiveness and clearance of refluxate, whereas in NERD the increased frequency of reflux is more likely to be cleared by an intact peristaltic contraction.

**P324** MEAN NOCTURNAL BASELINE IMPEDANCE CORRELATES WITH REFLUX DISEASE SEVERITY BUT NOT SYMPTOMS

Humayra Abdul-Razakq\*, Amanda Raeburn, Oluyemi Femi-Ayeni, Andres Vales, Anton Emmanuel, Natalia Zarate, Rami Sweis. *University College London Hospital, London, UK*

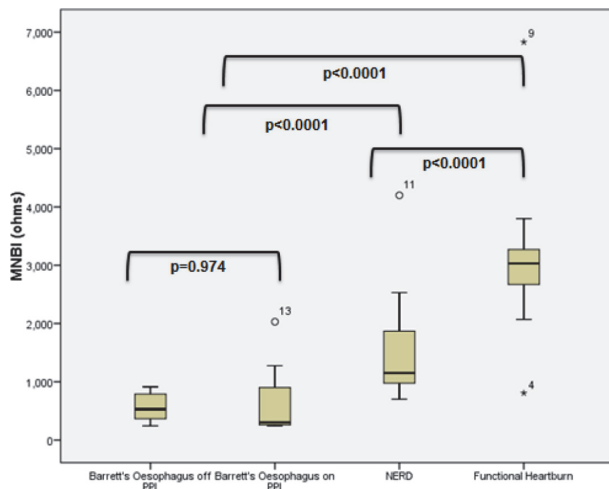
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**Introduction** The Lyon Consensus 2018 describes nocturnal baseline impedance (MNBI) as a reflection of oesophageal mucosa permeability, with lower values found in erosive than non-erosive reflux disease (NERD); however it is not clear how MNBI correlates with symptoms. This study aims to determine the relationship of MNBI across three common presentations of reflux; Barrett's oesophagus, NERD and functional heartburn (FH).

**Methods** Between 2014 and 2020, pH-Impedance measurements and symptom index (SI) were collected for 37 consecutive patients with at least 3 cm of Barrett's oesophagus (13 on and 24 off proton pump inhibitors; PPI). 37 consecutive patients with NERD and 37 with FH were also included for comparison. MNBI was calculated from sensors at 3 and 5 cm above the LOS over 3 × 10 minute intervals during the nocturnal period.

**Results** There was a significant difference in median acid exposure time (AET) between the 3 subgroups; Barrett's (14.0%(6.3%,23.5%), NERD (8.9%(5.6%13.5%) and FH (1.9 (0.7%, 2.7%) ( $p < 0.001$ ). AET was greater in patients with Barrett's off PPIs (median AET 16.9% (11.4%, 27.7%) than on PPIs (8.9%(2.3%,14.7%) ( $p < 0.01$ ). Barrett's patients reported the fewest symptoms (7.5; 0–24) ( $p = 0.047$ ), whereas FH (13.5; 6–28) and NERD (15; 6–41) were similarly more symptomatic ( $p = 0.660$ ). On the other hand, NERD patients were more likely to have a positive SI (12/37; 32.4%), followed by Barrett's (7/37; 18.9%) and FH (1/37; 2.7%) ( $p = 0.002$ ). Similarly, the median SI for NERD was highest (32.3%; 6.4–54.5%) compared to Barrett's (6.25%; 0–38%) and FH (0%; 0%,8.2%) ( $p < 0.0001$ ).

MNBI was low in Barrett's compared to NERD and FH (figure 1;  $p < 0.0001$ ). The 13 Barrett's patients studied on PPI with proven adequate acid suppression ( $AET \leq 6.0$ ), continued to exhibit a low MNBI which was similar to the 24 Barrett's



**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

<sup>1</sup>JL Alexander\*, <sup>2,3,4</sup>A Andreasson, <sup>5</sup>LW Hugerth, <sup>5</sup>L Engstrand, <sup>6,7</sup>MM Walker, <sup>7</sup>NJ Talley, <sup>1</sup>N Powell. <sup>1</sup>Div. of Digestive Diseases, Imperial College, London, UK; <sup>2</sup>Dept. of Psychology, Macquarie University, North Ryde, Australia; <sup>3</sup>Stress Research Institute, Stockholm University, Stockholm, Sweden; <sup>4</sup>Dept. of Medicine Solna, Karolinska Institutet, Solna, Sweden; <sup>5</sup>Center for Translational Microbiome Research, Karolinska Institutet, Solna, Sweden; <sup>6</sup>Dept. of Anatomical Pathology, University of Newcastle, Newcastle, Australia; <sup>7</sup>Faculty of Health and Medicine, University of Newcastle, Newcastle, Australia

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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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### P326 IDENTIFICATION OF NOVEL SUBGROUPS IN IRRITABLE BOWEL SYNDROME USING LATENT CLASS ANALYSIS: BEYOND STOOL FORM

<sup>1</sup>Christopher J Black\*, <sup>2</sup>Yan Yiannakou, <sup>3</sup>Lesley A Houghton, <sup>4</sup>Elspeth Guthrie, <sup>4</sup>Robert West, <sup>1,3</sup>Alexander C Ford. <sup>1</sup>Leeds Gastroenterology Institute, Leeds Teaching Hospitals NHS Trust, Leeds, UK; <sup>2</sup>County Durham and Darlington NHS Trust, Durham, UK; <sup>3</sup>Leeds Institute of Medical Research at St. James's, University of Leeds, Leeds, UK; <sup>4</sup>Leeds Institute of Health Sciences, University of Leeds, Leeds, UK

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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;