Introduction Lymphocytic duodenosis (LD) is defined by normal villous architecture and intraepithelial lymphocytes (IELs) > 25 per 100 enterocytes. Such patients should not be diagnosed with coeliac disease (CD), solely by histology, as recent studies have suggested other associations with LD. Despite a paucity of data, previous investigators have suggested that LD may also be associated with irritable bowel syndrome (IBS).

Aims To prospectively assess the associations between LD and IBS.

Methods Two hundred patients with LD were investigated for associated LD conditions, by means of revisiting the patient's history and recent investigations including the initial coeliac serology, followed by a combination of gluten challenge, HLA typing, repeat duodenal biopsies, and exclusion of infection/inflammatory bowel disease.

A diagnosis of CD was based on the persistence or progression of LD on a gluten-containing diet, the presence of HLA DQ2 or DQ8, and a clinical response to a gluten free diet.

In the absence of an alternative cause, a diagnosis of IBS was made on the presence of the ROME III criteria.

Results 150 female, 50 male, mean age 49, SD 16, age range 17–83

An identifiable association was found in 70% of patients : CD (20%), NSAIDs (17%) and H.pylori (16%) accounting for the majority. Other causes included gastrointestinal infections (7%), autoimmune disorders (5.5%), inflammatory bowel disease (2%), TB or HIV (1.5%), and IgA deficiency (1%).

In 60 cases (30%) no cause was found, although reassuringly two-thirds normalised their histology. In just over half of those without an identifiable cause, symptoms were consistent with IBS (35/60). IBS, therefore, accounted for 17% of all LD cases.

Whereas all patients with CD were HLA positive, only 55% of those with alternative causes or IBS were HLA positive ($p < 0.0001$).

Conclusion 17% of LD is associated with the Rome III criteria for IBS. LD may, therefore, be a disease marker for IBS and a reflection of low grade inflammatory response although no clues to the triggering mechanism were elucidated.

Disclosure of Interest None Declared

OC-034 CORTICAL AND BRAINSTEM NEUROPHYSIOLOGICAL MECHANISMS UNDERLYING DYSPHAGIA IN PARKINSON'S DISEASE: A TRANSCRANIAL MAGNETIC STIMULATION STUDY' 'ON' AND 'OFF' LEVODOPA

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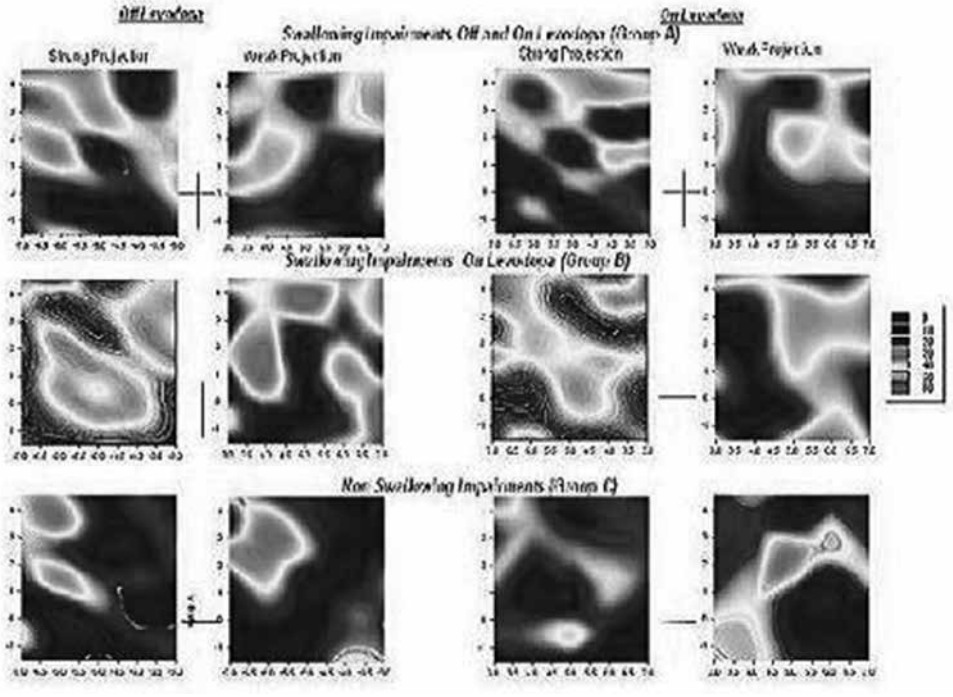
Introduction Dysphagia in Parkinson's disease (PD) patients, persisting despite dopaminergic medication, affects nutritional and drug intake with reduced quality-of-life (Michou & Hamdy, Exp Rev Neurother 2010). Here we explore the potential neurophysiological mechanisms underlying dysphagia in PD when 'on' and 'off' Levodopa with transcranial magnetic stimulation (TMS).

Methods 26 verified PD patients (65 ± 8 yoa, 10 male) completed the Swallowing Disturbance Questionnaire (Manor *et al* Mov Dis 2007) and SWAL-QOL (McHorney *et al* Dysphagia 2002). After 12 hours 'off' L-dopa, patients underwent a) cortical TMS mapping for pharyngeal musculature, b) brainstem reflexes TMS stimulation, c) lung function tests with spirometry before and after (d) videofluroscopy (VFS) of liquid, pureed boluses and saliva. These were repeated following the administration of L-dopa to the patients. Factorial and non-parametric statistical tests were applied.

Results VFS identified dysphagia in 10 patients (Group A), while 6 patients showed swallowing difficulties only 'On-L-dopa'(Group B), with the remainder 10 subjects being non-dysphagic (Group C). Swal-QOL score was reduced in Group A ($p < 0.05$), while aspiration-penetration scores (thin and puree consistencies) and additional 'clearing swallows' worsened after administration of L-dopa ($p < 0.05$) for Group B. After Levodopa intake, cortical pharyngeal excitability was decreased significantly in Group A ($p < 0.005$), but increased in Group C ($p < 0.001$) compared to 'off-state' (Figure 1). No significant change in lung function was observed during the off- or on-state, nor did lung function correlate with dysphagia. The amplitudes of the brainstem reflexes were different between the 3 groups 'on-Levodopa'. Patients experiencing dysphagia only when



Abstract OC-034 Figure 1

on Levodopa (Group B) showed significant decrease (inhibition) in brainstem reflexes amplitude after Levodopa.

Conclusion Different patterns of cortical and brainstem activity, reflecting different mechanisms of compensation with Levodopa intake, can differentiate dysphagic PD groups. Moreover, physiology was negatively affected by L-dopa in groups with inhibition of brainstem reflexes. Our novel brain stimulation data demonstrate the dysphagia in PD patients is associated with altered cortical and brainstem activity, modulated by L-dopa differentially across the PD groups, providing the platform for research on rehabilitation for dysphagia in PD.

Disclosure of Interest None Declared

OC-035 MECHANISM OF LACTOSE INTOLERANCE IN IRRITABLE BOWEL SYNDROME: ROLE OF ANXIETY, MUCOSAL IMMUNITY AND VISCERAL HYPERSENSITIVITY

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Introduction Many patients, especially those with Irritable Bowel Syndrome (IBS), report food intolerance; however the mechanism underlying these "functional digestive symptoms" is unknown. We assessed the role of psychological factors, mucosal immune activation and visceral sensitivity on the development of lactose intolerance (LI) after ingestion of 20g lactose in IBS patients and healthy controls (HCs) with lactase deficiency: a validated, clinical experimental model of intolerance to poorly absorbed, fermentable foods (Yang *et al* Clin Gastro Hep 2013 in publication).

Methods IBS-D patients meeting Rome III criteria (n = 277) and age/sex matched HCs (n = 64) underwent a 20g lactose hydrogen breath test (LHBT) with measurement of hydrogen production, abdominal distention, and LI symptoms. Hospital Anxiety and Depression Score assessed psychologic state. Barostat measured rectal sensitivity. Additionally, 55 IBS-D patients and 18 HCs completed colonoscopy with colon and terminal ileum (TI) biopsies for quantification of mast cells (MCs), T lymphocytes, and enterochromaffin cells (ECC).

Results Hydrogen production and distention were similar in IBS patients and HCs during LHBT; however LI symptoms were more frequent in IBS (54% *vs.* 28%, $P < 0.001$), including bloating (39% *vs.* 14%, $P < 0.001$), borborygmi (39% *vs.* 22%, $P = 0.010$), pain (31% *vs.* 11%, $P = 0.001$) and diarrhoea (29% *vs.* 9%, $P = 0.001$). IBS patients were more anxious ($p < 0.001$) and had higher rectal sensitivity than HCs ($P = 0.001$). Multivariate analysis indicated that hydrogen production increased the likelihood of bloating (OR2.2 (95%CI 1.1–4.4), $P = 0.028$) and borborygmi (OR12.4 (3.3–45.8), $P < 0.001$), but not objective distention ($P = 0.673$). Visceral hypersensitivity also associated with bloating (OR6.6 (1.7–25.0), $P = 0.005$) and total symptom score (OR3.7 (1.3–10.9, $P = 0.014$). A planned subanalysis showed that, compared to IBS patients with no symptoms, those with LI were more anxious ($p = 0.045$) and more likely to have visceral hypersensitivity ($p < 0.001$).

In those that had colonoscopy, IBS patients with LI (25/55 (45%)) had increased MCs ($p < 0.006$), T-cells and ECC (both $p < 0.05$) in proximal colonic and TI mucosa compared to patients without LI and HCs. Multivariate analysis indicated that total LI symptom score was associated with anxiety ($r = 0.519$, $P < 0.001$), MCs in terminal ileum ($r = 0.650$, $P < 0.001$) and visceral sensitivity ($r = 0.629$, $P < 0.001$).

Conclusion Gas production and sensitivity to luminal distension both contribute to digestive symptoms after lactose ingestion in patients with lactase deficiency. IBS-D patients with LI are characterised by anxiety, evidence of mucosal immune activation and visceral hypersensitivity.

Disclosure of Interest None Declared

OC-036 NEURONAVIGATED REPETITIVE CEREBELLAR STIMULATION PRODUCES LONG-LASTING ACTIVATION OF HUMAN CORTICAL SWALLOWING PROJECTIONS

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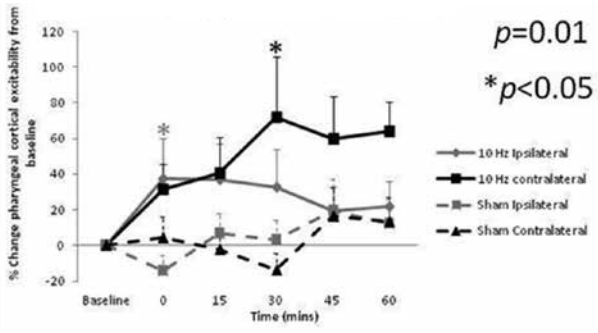
Introduction Animal studies, human brain imaging and more recently Transcranial Magnetic Stimulation (TMS) suggest a role for the cerebellum in human swallowing. Moreover, paired-pulse cerebellar-cortical TMS delivered in rapid succession (50–200 ms intervals) facilitates pharyngeal motor cortex excitability. We therefore hypothesised that high-frequency (5–20 Hz) repetitive TMS (rTMS) of the cerebellum could modulate pharyngeal motor cortex excitability producing long-lasting changes that may prove to be therapeutically useful for dysphagia after stroke.

Methods In 17 healthy adults (6 female, age range 18–61 yrs), anatomical MR brain scans were acquired. Thereafter participants were intubated with an intraluminal catheter to record pharyngeal electromyography and underwent TMS cortical mapping with neuronavigation to co-localise pharyngeal motor representation bilaterally, hand motor cortex and the cerebellar site which evoked the largest pharyngeal motor response. Subjects were then randomised to receive one of 5 neuronavigated cerebellar rTMS interventions (Sham, 1 Hz, 5 Hz, 10 Hz and 20 Hz, at least 1 week apart) to the cerebellar site evoking the largest baseline pharyngeal responses to single-pulse cerebellar TMS. Bihemispheric pharyngeal cortical excitability (ipsilateral and contralateral cortex to cerebellum site) was measured at baseline and for up to one hour post cerebellar rTMS intervention. Abductor pollicis brevis (APB) recordings were used as control. Interventional data were compared to sham using repeated measures ANOVA.

Results Cerebellar rTMS was tolerated well and delivered at an average intensity of 55% of stimulator output. Compared to Sham, 10Hz cerebellar rTMS increased pharyngeal cortical excitability ($F(1.16) = 8.3$, $^{*}p = 0.01$), with maximal size and durational effects seen primarily in the contralateral pharyngeal cortex (+72%, $^{**}p = 0.02$, *Figure 1*). By contrast, 1Hz ($F(1.16) = 0.3$, $p = 0.60$), 5Hz ($F(1.16) = 0.5$, $p = 0.48$), and 20Hz rTMS ($F(1.16) = 1.3$, $p = 0.27$) cerebellar conditioning did not significantly alter pharyngeal excitability compared to Sham. APB responses were not significantly different to sham after any intervention.



Abstract OC-036 Figure 1 Effects of 10 Hz Cerebellar rTMS on pharyngeal cortical excitability.