

P343 EFFECTS OF UNILATERAL AND BILATERAL CEREBELLAR MAGNETO-ELECTRIC STIMULATION ON PHARYNGEAL CORTICAL ACTIVITY AND SWALLOWING BEHAVIOUR

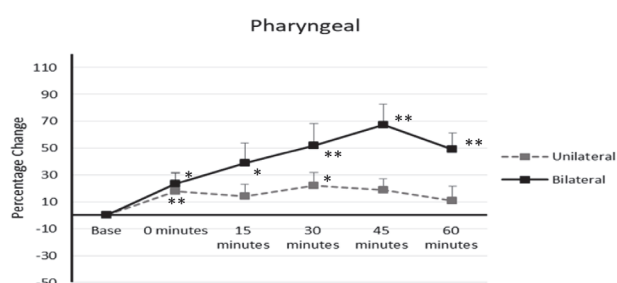
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Background The cerebellum is recognised to bilaterally modulate sensorimotor function and has recently been shown to play a role in swallowing. Indeed, we have previously shown that unilateral cerebellar repetitive trans-cranial magnetic stimulation (rTMS) can excite corticobulbar motor pathways to the pharynx. However, the comparative effects of bilateral versus unilateral cerebellar rTMS on these pathways remain unknown.

Method In this cross-over study, healthy participants (n=13) were randomly allocated to receive unilateral or bilateral 10 Hertz cerebellar rTMS. Participants were intubated with pharyngeal electromyography and/or manometry catheters to acquire motor evoked potentials (MEPs) and pressure recordings. The first part of the study involved using single pulse TMS to measure baseline motor cortex pharyngeal MEP amplitudes, before either unilateral or bilateral cerebellar rTMS was administered. Repeat measures of PMEP amplitude were performed at 15-minute intervals for an hour following in interventions. Thereafter, in further studies, a cortical 'virtual lesion' (V/L) was applied prior to cerebellar rTMS with pre and post PMEPs and measurements of swallowing accuracy using a behavioural task.

Results Across the study arms, bilateral cerebellar rTMS was significantly more effective than unilateral (Unilateral vs bilateral MEP P=0.0005 *figure 1*; V/L MEP and behaviour P=0.0005 and 0.0005 respectively).



Abstract P343 Figure 1

Conclusion Bilateral cerebellar rTMS shows greater facilitatory brain and behavioural swallowing effects than unilateral stimulation with the potential to be a more powerful clinical therapy for neurogenic dysphagia.

P344 TOWARDS A DATA-DRIVEN APPROACH TO THE IMPLEMENTATION OF THE LOW-FODMAP DIET IN IBS

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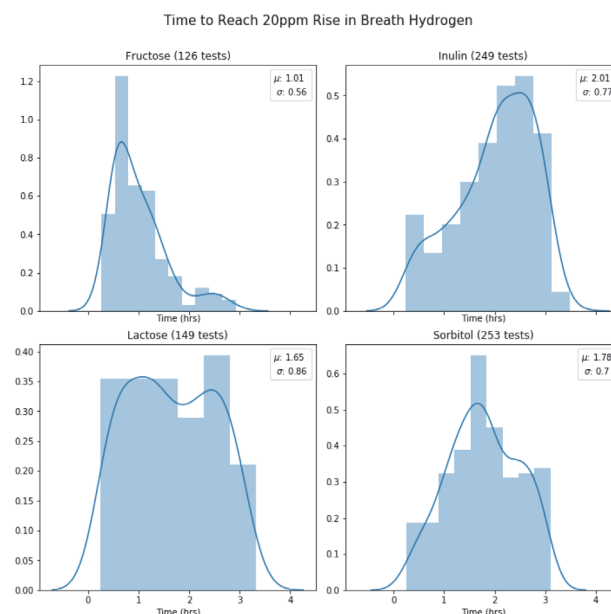
Introduction The low-FODMAP diet (LFD) is now frequently used in the management of Irritable Bowel Syndrome (IBS).

However, the process can be lengthy, has no standardised protocol and relies exclusively on self-reported symptoms, which are subjective and can be unreliable, in particular when they are reported retrospectively.

Methods A total of 2423 carbohydrate challenges (695 lactose 25 g, 531 fructose 25 g, 460 sorbitol 10 g & 737 inulin 10 g) were performed by 1349 participants using a portable app-connected breath analysis device from April 2018 until February 2020. The substrate was administered in a fasting state to minimise the likelihood of symptom generation. Upon ingestion of the substrate, breath tests were performed every 15 minutes for 3 hours. The criterion for a positive challenge was a rise in breath hydrogen of 20 ppm or greater from the lowest preceding breath hydrogen measurement.

Results It was found that 21% of lactose, 24% of fructose, 55% of sorbitol, and 34% of inulin challenges reached the positive test criterion. The mean time taken to reach this criterion was respectively 1.7 h, 1.0 h, 1.8 h and 2.0 h illustrating some of the temporal dynamics of carbohydrate malabsorption and potential metabolism by the gut microflora (figure 1). The area-under-the-curve (AUC) was 88.6 ppm.h, 87.5 ppm.h, 82.4 ppm.h and 68.8 ppm.h for lactose, fructose, sorbitol and inulin respectively.

Conclusions Less than a quarter of lactose or fructose challenges were positive. Despite sorbitol being only passively absorbed (Beaugerie et al, *Gastroenterology*. 99 (1990): 717–723), 45% of participants yielded a negative challenge. Similarly, for inulin, which is entirely non-absorbable, 66% of participants did not reach the positive test criterion. It is likely that some participants would have eventually reached the criterion for inulin. It is also likely that only some participants are host to the species of colonic bacteria with the capability to cleave inulin's $\beta(2,1)$ bonds. It was seen that the chain length greatly affects mean time to reach the positive criterion, despite the AUC being similar for each FODMAP, except inulin. This offers evidence that significant amounts of hydrogen may have continued to be produced in the case of inulin had the challenge duration been extended.



Abstract P344 Figure 1 Distributions of the time taken to meet positive challenge criterion

Accumulation of the gases produced during the fermentation of FODMAPs is likely one of the leading factors associated with symptom generation in IBS. The observed differences in timing and quantity of breath hydrogen illustrates the complexity of human and bacterial metabolism of the FODMAP substrates. Measuring breath hydrogen subsequent to the ingestion of a fixed FODMAP dose, provides a quantifiable indicator of the volume of colonic gas that would be produced under dietary conditions.

P345 DEAR DOCTOR, COULD YOUR PATIENT'S UNEXPLAINED GASTROINTESTINAL SYMPTOMS BE CAUSED BY MAST CELL ACTIVATION SYNDROME?

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Introduction Mast Cell Activation Syndrome (MCAS) is a condition in which mast cells are inappropriately activated leading to inflammatory and allergic-type symptoms to everyday triggers such as food, chemicals, stress and more. Destabilisation of the mast cell has a direct impact on the gastrointestinal (GI) tract and patients with the symptoms of MCAS are often referred to a gastroenterologist for investigation.

Methods To assess how MCAS impacts the GI system, the charity Mast Cell Action undertook a UK-wide online survey of adults and children (via their carers) with a confirmed or suspected diagnosis of MCAS. The survey evaluated symptoms most frequently experienced, tests and investigations commonly undertaken, and medical management strategies.

Results The survey was completed by 112 adults and on behalf of 30 children. A diagnosis of MCAS was confirmed in 68/112 (61%) of adults and 17/30 (57%) of children. The three most common GI symptoms were bloating (n=100 [89%]), pain (n=96 [86%]) and diarrhoea (n=90 [80%]) in adults, and pain (n=26 [87%]), GERD (n=24 [80%]) and constipation (n=22 [73%]) in children. Adults most frequently underwent investigation for coeliac disease (n=73 [65%]) and IBS (n=68 [61%]) whereas children underwent investigation for coeliac disease (n=16 [53%]), GERD (n=10 [33%]) and H. Pylori (n=8 [27%]). The surveyed patients had undergone a wide range of tests and investigations, with 72 adults (64%) and 14 children (47%) undergoing endoscopy and 59 adults (53%) and 8 children (27%) undergoing colonoscopy. In addition to MCAS, the most common diagnoses were IBS (n=48 [43%] and n=4 [13%], respectively), GERD (n=23 [21%] and n=7 [23%]) and coeliac disease (n=10 [9%] and n=2 [7%], respectively). Medical management strategies most frequently involve sodium cromoglicate, ranitidine, and PPIs. Diet modification was reported by 76 adults and 17 children; 32 adults and 13 children currently have a gastroenterologist leading their care.

Conclusions This patient-reported survey indicates that MCAS patients experiencing GI symptoms are frequently investigated for a range of conditions. MCAS is notoriously difficult to diagnose, requiring a combination of multisystem symptoms, biological mediator test results and response to treatment.¹ Although most recognised for its acute allergic symptoms (particularly anaphylaxis), the chronic symptoms of MCAS can be severely debilitating and significantly

impact patient lives. GI symptoms are one of the most frequent chronic symptoms of MCAS due to the high presence of mast cells in the gut.² This survey confirms the range of GI symptoms suffered by people with MCAS and highlights the need to access the right tests and clinical review in order to achieve a diagnosis.

REFERENCES

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P346 ABDOMINAL FUNCTIONAL ELECTRICAL STIMULATION A NOVEL TREATMENT FOR NEUROGENIC BOWEL MANAGEMENT IN MULTIPLE SCLEROSIS

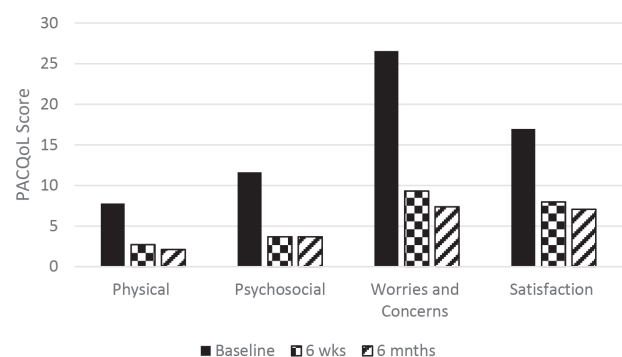
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Introduction Neurogenic bowel dysfunction for people with Multiple Sclerosis (PwMS) is a debilitating condition leading to a lower quality of life. Initial studies suggest abdominal functional electrical stimulation (ABFES) could be an effective (6 weeks) short term bowel management treatment, however, long-term benefits remain unexplored (Street, Peace, Padfield, Singleton., 2019, *Neurodegenerative Disease Management*, 9:83–39). Low compliance with standard care treatments for bowel management indicates a need to explore alternative treatments. The current study sought to explore the acceptability and effectiveness of using ABFES over a 24-week period and provide data for a future randomised controlled trial.

Methods Thirty-four PwMS with constipation (ROME IV criteria) participated in the study. A two-channel neuromuscular stimulator was used to elicit a visible contraction of the anterior abdominal wall muscles (stimulation parameters 40 Hz, 300 μ sec pulse width and 40–50 mA). Participants self-administered treatment at home for 30 minutes twice a day for six weeks and titrated for need thereafter. The Patient Assessment of Constipation related Quality of Life (PACQoL) questionnaire was completed at baseline, six weeks and six months (PACQoL minimum clinical important difference (MCID) = 0.5 points).

Results A non-parametric Friedman test of differences among repeated measures found an overall significant difference in



Abstract P346 Figure 1 Difference in PACQoL domains for baseline, six weeks and 24 weeks