investigations. The further tests undertaken were at the discretion of the investigating clinician. Statistical analysis was performed using SPSS with Fisher's exact test used to compare categorical data.

Results 403 patients (277 female, median age 52 years) who met Rome II criteria for D-IBS were followed-up during the study period. Investigations undertaken in this cohort of patients were as follows: faecal pancreatic elastase (313) gastroscopy (208), colonoscopy (188), glucose or lactose hydrogen breath tests (62), CT/MRI scan (40), barium enema (38), SeHCAT (18) and small bowel capsule endoscopy (18). Final diagnoses are shown in Abstract PWE-056 table 1. 88 patients (22%) were subsequently identified to have an alternative diagnosis than D-IBS with pancreatic insufficiency and coeliac disease being the most common. When comparing diagnostic yields of individual tests, a lactose-hydrogen breath test had the highest positive yield of 28.6% (8/28), which was significantly higher than any other diagnostic test undertaken ($p<0.01$).

Conclusion This study highlights the frequency of investigations undertaken in patients with D-IBS symptoms. While the majority of patients have negative tests, there remains a significant number of patients in whom underlying pathology is identified accounting for their D-IBS symptoms. Although NICE guidelines advocate testing for coeliac disease, our study also demonstrates the importance of testing for pancreatic insufficiency in patients presenting with D-IBS symptoms.

Competing interests None declared.

PWE-057 BILATERAL REVERSAL OF A VIRTUAL LESION TO HUMAN PHARYNGEAL MOTOR CORTEX BY CARBONATED WATER SWALLOWING

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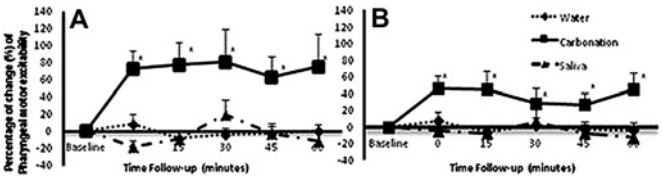
Introduction Anecdotal clinical evidence supports the use of carbonated liquids in reducing the likelihood of aspiration in dysphagic patients (Bulow *et al. Acta Radiol* 2003; Sdravou *et al. Dysphagia* 2011). Repetitive transcranial magnetic stimulation (rTMS) delivered at 1-Hz can induce transient focal suppression of pharyngeal motor cortex (Mistry S, *et al. J Physiol* 2007). Here we investigated whether swallowing of carbonated water can reverse the inhibitory effects of a virtual lesion to pharyngeal motor cortex, compared to still water and saliva swallowing.

Methods In 14 healthy subjects (7 male, mean age 34±15 (SD)) pharyngeal electromyographic responses were recorded using an intraluminal catheter after the application of Transcranial Magnetic Stimulation (TMS) over pharyngeal motor cortex, as a measure of cortico-bulbar excitability. On three randomised visits, subjects were cued by a visual feedback software to perform a total of 40 swallows over 10 min (swallows every 15 s) of either carbonated water or still water vs 10 min of saliva swallowing ad libitum (control), before and after an unilateral 1-Hz virtual lesion of the pharyngeal motor cortex. Cortical excitability (presented as mean±SEM) was then reassessed bilaterally for 60 min post-interventions and analysed with repeated measures ANOVA (SPSS V.14).

Results A three-way ANOVA showed a significant interaction of Hemisphere × Intervention × Time [$F(1,13)=5.82$, $p=0.03$]. Compared to saliva swallowing (control), there was significant increase in cortical excitability bilaterally following swallowing of carbonated water (lesioned pharyngeal motor cortex [$F(1,13)=7.5$, $p=0.017$], with a maximum increase of 81±38% at 30 min post intervention (Abstract PWE-057 figure 1A); unlesioned [$F(1,13)=4.75$, $p=0.04$], with a maximum of 46±16%, immediately post intervention, Abstract PWE-057 figure 1B), not seen with still water swallowing.



Abstract PWE-057 Figure 1 The effects of carbonation, still water and saliva swallowing to the lesioned (A) and contralateral (non-stimulated pharyngeal motor cortex, B) with 1-Hz fTMS in 14 healthy volunteers, *$p<0.05$.

Conclusion Carbonation reverses the effects of a unilateral virtual lesion with significant increases in cortical excitability not limited to the lesioned hemisphere. These data support the notion that chemesthetic stimuli of carbonation may provide the required peripheral sensory information that can influence brain swallowing activity compared to still water swallowing. These data provides the platform for considering the use of carbonation as facilitating stimuli in dysphagic patients who aspirate thin liquids.

Competing interests None declared.

PWE-058 POSTPRANDIAL SUPPRESSION OF REFLUX BY A RAFT FORMING ALGINATE (GAVISCON ADVANCE) COMPARED TO A SIMPLE ANTACID: TECHNICAL ASSESSMENT OF PH-IMPEDANCE MONITORING AND CLINICAL FEASIBILITY STUDY IN GASTRO-OESOPHAGEAL REFLUX DISEASE (GORD) PATIENTS

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Introduction Proton Pump Inhibitors (PPI) reduce acid reflux but not the frequency or proximal extent of reflux events that are a cause for persistent symptoms on PPI. Alginate preparations containing bicarbonate are effective for short-term control of reflux symptoms by formation of a viscous raft above the meal and acid neutralisation. However mechanistic studies have found equivocal effects of alginates on reflux suppression. It is unclear whether this was due to lack of effect, study power or technical issues.

Aim (i) technical assessment of pH-impedance equipment (Sandhill) in patients taking acid and reflux suppressants (ii) in vivo assessment of mechanistic effects of Gaviscon Advance (GA; Reckitt Benckiser) and Milk of Magnesia (MM; Boots) on postprandial reflux.

Methods (i) To assess effects on signal detection 10 patients took 10 ml GA or MM followed by repeated, single 10 ml swallows of orange juice (pH 4) until chemical and volume clearance was detected (ii) A randomised, controlled, double-blind, cross-over clinical study in 20 GORD patients (9 male: 11female; age 25–63) referred for investigation of reflux symptoms. On subsequent days at the beginning and end of a 24 h monitoring period, patients were randomised to receive either 10 ml GA or MM (both mint flavoured) after a mixed test meal (600 kcal). Postprandial distal and proximal reflux events (acid and non-acid) were documented over 4 h by pH-impedance with the patient in the upright, seated position.

Results (i) Technical: After intake of 10 ml GA or MM the pH and impedance signal fully recovered after median 6 (2–12) and 4 (2–10) swallows of orange juice. (ii) Clinical: During the 4 h postprandial observation acid exposure time (mean 2.3% (SD 3.3%) vs 3.4% (4.2%), $p=0.296$) and number of distal reflux events (20.5 (13.6) vs 22.5 (9.4), $p=0.500$) was similar after ingestion of GA and MM.