

GI physiology

PWE-001 **AMBULANT HIGH RESOLUTION MANOMETRY STUDIES OF THE MECHANISMS OF GASTRO-OESOPHAGEAL REFLUX IN PATIENTS WITH AND WITHOUT EVIDENCE OF HIATUS HERNIA**

doi:10.1136/gutjnl-2012-302514d.1

B T Theron,* A Yamamoto, H Aladin, N Trudgill. *Department of Gastroenterology, Sandwell Hospital, West Bromwich, UK*

Introduction Recent studies have shown that high resolution manometry (HRM) detects more transient lower oesophageal relaxation (tLOSr) than the established sleeve sensor. Previous studies using the sleeve sensor have suggested that when a hiatus hernia (HH) is present and in patients with more severe oesophagitis, gastro-oesophageal reflux (GOR) more commonly occurs due to mechanisms other than TLOSr. We have developed a unique ambulatory HRM system to study mechanisms of GORD under more physiological conditions in patients with reflux oesophagitis or Barrett's oesophagus, with and without hiatus hernia.

Methods 10 patients with HH and six patients without HH (all with an endoscopic diagnosis of reflux oesophagitis) were studied after a fast for at least 4 h. A 36 channel solid state HRM/impedance catheter was placed spanning the stomach to pharynx. A pH electrode was placed 5 cm above the GOJ. Patients were studied at rest and during 15 min of standardised exercise on an exercise bike, before and after a meal (sausage or bacon with egg sandwich with 500 mls of milkshake—736 calories). In addition subjects walked for 30 min in the post-prandial period.

Results 12 patients were male; median age 60 (range 35–76) years; six patients had LA A/B oesophagitis and 10 patients had LA C/D (5) or Barrett's oesophagus (5). Acid reflux episodes in patients with HH were due to tLOSr in 90%, low LOS pressure in 6% and swallowing in 4%, whereas in patients without HH they were due to tLOSr in 88%, low LOS pressure in 4% and swallowing in 8%. tLOSr appeared to be more frequent in patients with HH (13.5 (IQR 11.1–18.7) per hour vs 10 (IQR 7.6–15.6) per hour) but this difference fell short of statistical significance ($p=0.06$). There was no difference in the proportion of TLOSr associated with acid reflux in patients with (59%) and without HH (47%) but patients with HH were more likely to have impedance evidence of gas or liquid reflux during tLOSr than patients without HH (96% vs 83%, $p<0.001$).

Conclusion Prolonged ambulant studies of the mechanisms associated with acid gastro-oesophageal reflux reveal that tLOSrs are the predominant mechanism associated with acid reflux in patients with oesophagitis or Barrett's oesophagus both with and without HH. tLOSr appeared to be more common in patients with HH but this difference fell short of statistical significance. Patients with HH were more likely to have evidence of reflux during tLOSr.

Competing interests None declared.

PWE-002 **IBS IN NIGERIA; IS THERE A DECLINE IN PREVALENCE?**

doi:10.1136/gutjnl-2012-302514d.2

¹C A Onyekwere,* ²A Asiyanni, ²J Obi. ¹*Internal Medicine, Lagos state University college of medicine, Lagos, Nigeria;* ²*Internal Medicine, Lagos state University teaching hospital, Lagos, Nigeria*

Introduction Background: IBS is a common functional gastrointestinal disorder that presents in both primary healthcare as well as gastroenterology clinic. Reports of prevalence of IBS vary depending on diagnostic criteria as well as geographical setting. Data from Nigeria reveal prevalence of between 26% and 33%. **Aim:** we set out to determine the prevalence of IBS in Lagos population which is representative of the Nigeria society.

Methods Consecutive patients with recurrent abdominal pain who presented to the general outpatient unit of the three big referral hospitals in Lagos between 2010 and 2011 were evaluated for the presence of IBs using the Rome 111 criteria.

Results 350 subjects were evaluated during the study period of which 65 (36 females) met the Rome 111 criteria giving a prevalence of 18.6%. The IBS subtypes were IBS-C (33), IBS-D (18), and IBS-M (14). Occurrence of IBs was significantly associated with consumption of starchy food (rice, yam, potato, spaghetti, beans) and citrus foods. Majority of the IBs subjects (75%) were positive for small intestinal bacterial overgrowth using the hydrogen breath test.

Conclusion This study has shown a lower prevalence of IBS (18.6%) than the three previous reports from our setting (26%, 30%, 33%).

Competing interests None declared.

REFERENCES

1. **Olubuyide IO**, Olawiyi F, Fasanmade AA. A study of irritable bowel syndrome diagnosed by Manning Criteria in an African population. *Dig Dis Sci* 1995;**40**:983–5.
2. **Ladep NG**, Obindo TJ, Audu MD, *et al*. Depression in patients with irritable bowel syndrome in Jos, Nigeria. *World Gastroenterol* 2006;**12**:7844–7.
3. **Okeke EN**, Ladep NG, Adah S, *et al*. Prevalence of irritable bowel syndrome: a community survey in an African population. *Ann Afr Med* 2009;**8**:177–80.

PWE-003 **VASOPRESSIN CONTRACTS HUMAN ISOLATED STOMACH MUSCLE: POSSIBLE ROLE IN NAUSEA?**

doi:10.1136/gutjnl-2012-302514d.3

¹J Broad, ²P L Andrews, ¹G J Sanger.* ¹*Neurogastroenterology Group, Blizard Institute, Barts & The London SMD, QMUL, London, UK;* ²*Division of Biomedical Science, St George's University of London, London, UK*

Introduction Circulating levels of vasopressin are raised in association with nausea in humans and in species with an emetic reflex, whereas in rats exposed to emetic stimuli, levels of oxytocin but not vasopressin are raised.¹ One hypothesis is that vasopressin acts in the upper gut to help signal nausea, but in animals the concentrations which contract stomach muscle are usually higher than the concentrations measured in human plasma during nausea (around 10–200 pM). However, extreme species variations in gastric functions and genetics² means that studies must now be conducted with human stomach.

Methods Human stomach was obtained at surgery following informed consent. After removing the mucosa, strips were cut parallel to the circular muscle and suspended between ring electrodes in tissue baths for isometric recording (Kreb's; 5% CO₂ in O₂; 37°C; 2 g tension). Electrical field stimulation (EFS) was applied at 5 Hz (0.5 ms pulse width, 50 V, 10 s) every 1 min, for sub-maximal responses. N = number of patients. All drugs were added non-cumulatively.

Results In the gastric antrum, EFS-evoked contractions were prevented by 1 μM tetrodotoxin (n=3), attenuated by atropine 1 μM (n=3) and facilitated by the nitric oxide synthase inhibitor L-NAME 0.3 mM (by 11±7% n=14). Vasopressin (100 pM–100 nM) caused a concentration-dependent increase in baseline muscle tension of 230±68 mg, EC₅₀=1.2 nM, corresponding to a contraction equivalent to 226±118% of the EFS-evoked contraction (n=1–4 each concentration). However, there was no change in the magnitude of the contractions to EFS (+14±12% change at 100 nM). Elevated muscle tension persisted for >30 min in continued presence of the hormone (100 nM, n=4). In preliminary experiments with gastric fundus, only 100 nM vasopressin has been studied, being found to act similarly (an increase of 128 and 38 mg; n=2). Interestingly, oxytocin (100 nM) also increased baseline muscle tension in the antrum (by 164±64 mg, corresponding to an increase of 41±11% EFS; n=3), persisting for >30 min without affecting the magnitude of EFS evoked contractions (+13±4% change; n=3).

Conclusion Here we have shown for the first time that vasopressin and oxytocin have direct contractile effects on human isolated stomach muscle. The effective concentrations of vasopressin are within the range induced by nausea in humans. This indicates a potential direct role of vasopressin in signalling the induction of nausea in humans.

Competing interests None declared.

REFERENCES

1. **Stern RM**, Koch KL, Andrews PL. *Nausea: Mechanisms and Management*. Oxford Univ Press, 2011.
2. **Sanger GJ**, Holbrook JD, Andrews PL. The translational value of rodent gastrointestinal functions: a cautionary tale. *Trends Pharmacological Sci* 2011;**32**:402–9.

PWE-004 A STUDY OF FAECAL VOLATILE ORGANIC COMPOUNDS METABOLOME IN HEALTHY POPULATION ACROSS THE COUNTRIES

doi:10.1136/gutjnl-2012-302514d.4

¹I Ahmed,* ²V De Preter, ³K Rioux, ⁴N Ratcliffe, ⁵C S Probert. ¹Department of Gastroenterology, University of Bristol, Bristol, UK; ²Department of Gastroenterology, Translational Research Centre for Gastrointestinal Disorders, Leuven, Belgium; ³Department of Gastroenterology, University of Calgary, Calgary, Canada; ⁴Department of Department of sensors and Technology, University of West of England, Bristol, UK; ⁵Department of Gastroenterology, University of Liverpool, Liverpool, UK

Introduction Faecal biomarkers are emerging non-invasive tools for diagnosing gastrointestinal disorders. Faecal volatile organic compounds (VOCs) have been studied more recently in clinical diagnosis. Pattern of faecal VOCs in healthy population may provide basis for understanding changes in disease conditions. The VOCs within the metabolome may be different across the countries due to differences in dietary habits and environmental conditions and may have implications in developing their clinical utility.

Methods We aim to study the faecal VOCs of the healthy population from three different countries that is, England, Belgium and Canada. A total of 159 health volunteers (English=109, F=69), (Belgium=20, F=14), (Canada=30, F=17) donated faecal samples. Fresh samples were aliquoted in 18 mls sealed vials. VOCs were extracted using solid phase micro extraction and were analysed using gas chromatography–mass spectrometry. VOCs were identified using NIST library search comparing their fragment pattern.

Results A total of 232 VOCs were identified. Using binary data (presence or absence of VOCs), univariate analysis was used to identify those VOCs which were statistically significant ($p < 0.05$) in discerning differences between the three population groups. Alcohols, ketones and esters were predominantly associated with English volunteers compared to both Canadian and Belgium volunteers while aldehydes and alkenes were predominantly detected VOCs in the Canadian and Belgium groups respectively. A multivariate discriminant function analysis utilising these VOCs was able to differentiate three groups with a sensitivity of 96% and specificity of 90%.

Conclusion The observed differences in the faecal VOCs metabolites of the healthy population in different countries may provide important basis in the clinical utility of faecal biomarkers. It may also provide information in studying the differences in disease prevalence and behaviour in different countries. Further studies are warranted to explore this area.

Competing interests None declared.

REFERENCES

1. **Probert CS**, Ahmed I, Khalid T, et al. Volatile organic compounds as diagnostic biomarkers in gastrointestinal and liver diseases. *J Gastrointest Liver Dis* 2009;**18**:337–43.
2. **Angriman I**, Scarpa M, D'Inca R, et al. Enzymes in feces: useful markers of chronic inflammatory bowel disease. *Clin Chim Acta* 2007;**381**:63–8.

PWE-005 HIGH RESOLUTION ANORECTAL MANOMETRY: FIRST STUDY ESTABLISHING NORMAL VALUES IN HEALTHY VOLUNTEERS

doi:10.1136/gutjnl-2012-302514d.5

¹J M Burke,* ¹W Jackson, ¹M M Withers, ¹H O'Grady, ²G S Duthie. ¹GI Physiology, Hull and East Yorkshire Hospitals NHS Trust, Cottingham, UK; ²Hull York Medical School, Hull, UK

Introduction High Resolution Anorectal Manometry (HRAM) combined with interpretive software allows for the interpolation of manometric recordings into highly detailed topographical plots of intraluminal pressure events. HRAM has previously been shown to correlate highly with conventional water perfused manometry measurements.¹ This preliminary study is the first report establishing HRAM pressures in healthy volunteers. The advantages of the detection of pressure changes over a longer length of the anal canal have already been shown to improve accuracy and the detection of abnormalities in the anorectum.²

Methods HRAM was performed using the Medical Measurement System (Enschede, Netherlands) consisting of an 8-channel HRAM catheter with sensors spaced at 0.8 cm intervals. Pressure data are displayed in topographic form using Medical Measurement System analysis software that is integrated into the system. Measurements of anal sphincter pressure at rest, cough, during voluntary squeeze, endurance squeeze and pushdown were evaluated. Volunteers also completed a questionnaire which provided a Wexner score.

Results A total of 20 healthy volunteers (11 Female, 9 Male) with a mean age of 40 (range 19–60) constituted the study population. The Wexner scores ranged from 0 to 1 (median 0).

Conclusion These preliminary measurements of HRAM pressures in healthy volunteers could serve as a valuable resource of normative data when performing HRAM studies in disease specific groups such as incontinence and constipation.

Abstract PWE-005 Table 1

Anal sphincter	Range	Median
Resting pressure	30–163 cm H ₂ O	109 cm H ₂ O
Cough pressure increase	39–305 cm H ₂ O	143 cm H ₂ O
Voluntary squeeze pressure	50–922 cm H ₂ O	275 cm H ₂ O
Endurance squeeze time	18–125 s	52 s
% of relaxation during pushdown	0–42% (17/20 relaxed)	14%

Competing interests None declared.

REFERENCES

1. **Jones MP**, Post J, Crowell MD. High-resolution manometry in the evaluation of anorectal disorders: a simultaneous comparison with water-perfused manometry. *Am J Gastroenterol* 2007;**102**:850–5.
2. **Rao SS**. Advances in diagnostic assessment of fecal incontinence and dyssynergic defecation *Clin Gastroenterol Hepatol* 2010;**8**:910–19.

PWE-006 DIAGNOSTIC YIELD AND CLINICAL OUTCOME FOR DEFAECATING PROCTOGRAPHY AND ANORECTAL MANOMETRY IN PATIENTS WITH CHRONIC CONSTIPATION

doi:10.1136/gutjnl-2012-302514d.6

¹M Bhalme,* ²S Murugesan, ²V Jayasekeran, ²E Wrightham, ²B Unsworth, ²A Mondino, ²J McLaughlin, ²P Paine. ¹North Manchester General Hospital, Manchester, UK; ²Salford Royal Foundation Trust, Salford, UK

Introduction Defaecating proctography (DFP) and anorectal manometry (ARM) are both used to investigate chronic