

OC-053

EFFECT OF AUTONOMIC MODULATION ON HUMAN OESOPHAGEAL PAIN HYPERSENSITIVITY

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Introduction Patients with Functional Gastrointestinal Disorders (FGID) often display persistent and heightened pain sensitivity to experimental gut stimulation, a phenomenon known as Visceral Pain Hypersensitivity (VPH). Current management of pain in FGID involves the use of either antispasmodics or antidepressants; both are often unsatisfactory. The role of the autonomic nervous system (ANS) in modulating pain is well known; however, the effect of ANS modulation on VPH has not been studied.

Methods The aim was to determine whether physiological modulation of the Autonomic Nervous System (ANS) influences the degree of oesophageal VPH in healthy volunteers using a validated model. 10 healthy volunteers (avr age 30.5 years; 8 male, 6 w-British) underwent psychological profiling for stress, anxiety and personality type. *Study 1:* Pain thresholds to proximal and distal oesophageal electrical stimulation were measured. Thereafter the subjects underwent hydrochloric acid infusion (0.15 M) in the distal oesophagus for 30 min. This was followed by measurements of oesophageal pain threshold (using visual analogue scales) to electrical stimulation in the proximal, unexposed oesophagus at 30, 60 and 90 min. Study 2 was performed at an interval of 2 weeks and the protocol was identical to that of study 1 except that during the acid infusion cardiac vagal tone (CVT) was increased by deep breathing at full inspiratory capacity in 4 sec followed by forced expiratory vital capacity in 6 sec at a frequency of 0.1 Hz (6 breaths/minute, over 5 min). ANS was monitored throughout in both studies.

Results The majority of volunteers were 'agreeable extroverts', which are protective personality factors. There was only 10% depression and 20% anxiety, showing our exclusion criteria effective. 70% of the subjects rated significant for alexithymia and showed a weak non-significant correlation with the level of sensitisation to acid ($r = 0.49$ $p = 0.14$). In study 1 in comparison to baseline, we observed a reduction in CVT during acid exposure while in study 2 the CVT increased during acid exposure, that is, (study 1 difference of -0.09 vs baseline; study 2 difference of 4.93 vs baseline) ($p = 0.006$). In study 2, all 10 volunteers reduced their level of oesophageal sensitisation to acid in comparison to study 1 with 50% failing to sensitise completely. Overall there was a reduction in sensitisation of 16 mA between study 1 and 2 ($p = 0.004$).

Conclusion This preliminary study suggests that the parasympathetic nervous system has anti-hyperalgesic properties in human oesophageal VPH. This data points to a possible change in the way we treat visceral pain, highlighting likely new targets for the development of novel treatments. Further research is now required with a powered study focusing on exploring mechanism of desensitisation during deep breathing.

Competing interests None.

Keywords functional gastrointestinal disorders (FGID), gastroesophageal reflux disease (GERD), non-erosive reflux disease (NERD), visceral pain hypersensitivity (VPH).