

randomly allocated to receive one endoscopic, intrapyloric injection of BTX-A (100 units in 4 ml saline), followed 1 month later by an injection of saline only ($n = 12$), or vice-versa ($n = 11$).

Both solid and liquid half-emptying times (measured using a breath test) significantly decreased after the first injection in the saline-first group; in the group that received BTX-A first, only solid half-emptying time decreased significantly. There were no further improvements in gastric emptying times after the second injection for both groups. Pooled data showed that the improvements in gastric emptying times and Gastroparesis Cardinal Symptom Index scores did not differ significantly between treatment and placebo.

The authors conclude that, in a cohort of patients with predominantly idiopathic gastroparesis, intrapyloric injection of BTX-A does not improve disease symptoms or gastric emptying rates to a greater extent than placebo.

Original article Arts J *et al.* (2007) Clinical trial: a randomized-controlled crossover study of intrapyloric injection of botulinum toxin in gastroparesis. *Aliment Pharmacol Ther* 26: 1251–1258

Acupuncture is effective in patients with GERD who do not respond to standard PPI therapy

Patients with GERD are usually treated with once-daily PPIs; however, studies have shown that 25–42% of patients treated with a standard-dose PPI continue to experience symptoms of GERD, such as heartburn, acid regurgitation and dysphagia. As acupuncture has shown considerable benefits in patients with various gastrointestinal disorders, Dickman and colleagues compared this alternative therapy with doubling the dose of the PPI in patients with GERD who fail treatment with a standard-dose PPI.

The study included 30 adult patients who had experienced GERD-related symptoms on at least 2 days per week for 3 months while receiving a standard-dose PPI (omeprazole 20 mg once daily). These patients were randomly allocated to receive either a double-dose PPI (i.e. omeprazole 20 mg twice daily; $n = 15$) or a standard-dose PPI plus acupuncture (10 sessions over 4 weeks, performed by an expert; $n = 15$). Patients completed the Short Form-36 quality-of-life questionnaire at baseline and after 4 weeks' treatment; in

addition, GERD-related symptoms were recorded throughout the treatment period using a self-report diary.

Patients in the acupuncture plus PPI group showed significant decreases in all GERD-symptom scores, whereas patients in the double-dose PPI group showed no decreases in the same scores. Significant improvements in the general health and bodily pain sections of the Short Form-36 questionnaire were seen in the acupuncture group only.

The authors conclude that the addition of acupuncture to a standard-dose PPI is more effective than doubling the PPI dose for controlling GERD-related symptoms in patients who do not respond to standard PPI therapy.

Original article Dickman R *et al.* (2007) Clinical trial: acupuncture vs. doubling the proton pump inhibitor dose in refractory heartburn. *Aliment Pharmacol Ther* 26: 1333–1344

Lgr5-positive cells might be adult stem cells that become cancer stem cells in tumors

Studies have found that the gene encoding Lgr5 (leucine-rich-repeat-containing G-protein-coupled receptor 5) is expressed in colon cancer cells and in ovarian and hepatocellular carcinomas. Elucidating the role of Lgr5 expression in malignancy is dependent on understanding its function in the normal cell; Lgr5 seems to be active in intestinal epithelial cells, where it is responsible for normal tissue renewal.

Barker *et al.* investigated the expression sites of Lgr5 in mice by use of screening and knock-out techniques to find out whether columnar epithelial cells represent intestinal stem cells, and to find out more about them.

The results showed that Lgr5 was indeed expressed in the cycling columnar cells at the crypt base of the intestinal villi. The cycling observed was constant and rapid, with a complete cell cycle taking place every 24 h. They also discovered that Lgr5 was actively expressed in rare cells in other tissues in the eye, brain, hair follicle, mammary gland, stomach and reproductive organs. Further studies involving lineage-tracing experiments in adult mice showed that the Lgr5-positive intestinal columnar epithelial cells at the crypt base almost certainly represent the stem cell of the small intestine and colon.