reflux (37%) than after acid reflux (11%). In all, 57% of the symptoms recorded were typical of GERD and 43% were atypical. Typical GERD symptoms were associated with a positive symptom index, and were predominantly related to nonacid reflux, whereas atypical symptoms were not associated with reflux.

Mainie *et al*. say that MII-pH monitoring could help to clarify the mechanisms underlying persistence of GERD symptoms during PPI therapy. They note that neither clinical presentation nor conventional pH monitoring can prove the presence or absence of reflux that causes GERD symptoms.

Original article Mainie I *et al.* (2006) Acid and non-acid reflux in patients with persistent symptoms despite acid suppressive therapy: a multicentre study using combined ambulatory impedance-pH monitoring. *Gut* **55:** 1398–1402

Hypnotherapy benefits patients with non-cardiac chest pain

Non-cardiac chest pain (NCCP) is a common, debilitating condition that causes considerable psychological distress, in part because it is notoriously difficult to treat. Previous studies have shown that other conditions that are similarly classed as functional gastrointestinal disorders—namely IBS and functional dyspepsia—respond well to hypnotherapy. Jones and colleagues have now investigated the efficacy of hypnotherapy for NCCP.

Patients with frequent angina-like chest pain (at least one episode per week), who had undergone a chest angiography with a normal result and did not have gastroesophageal reflux, were enrolled in this study. They were randomly assigned to receive hypnotherapy (15 patients) or supportive listening therapy plus placebo (13 patients) for 17 weeks, after a 4-week baseline monitoring period.

There was a markedly greater improvement in chest pain and quality-of-life measures in patients who received hypnotherapy compared with those who did not. In addition, hypnotherapy-treated patients also had a greater reduction in their use of concomitant medications. Anxiety and depression scores, and the frequency of chest pain, were not noticeably improved by either treatment regimen.

The authors conclude that hypnotherapy shows potential for patients with NCCP, and warrants investigation in larger studies that include a wider range of patients, such as those who have not undergone chest angiography for their symptoms.

Original article Jones H *et al.* (2006) Treatment of non-cardiac chest pain: a controlled trial of hypnotherapy. *Gut* **55:** 1403–1408

Aspergillus niger prolyl endoprotease as a treatment for celiac disease

Celiac disease is caused by an immune response to the digestion products of wheat gluten. Gluten is incompletely digested because of its high proline content—human digestive enzymes are unable to cleave proteins at proline residues. In susceptible individuals, some gluten peptides trigger a T-cell response, causing inflammation in the small intestine. Diet supplementation with nonhuman prolyl oligopeptidases, which can cleave proteins at proline residues, has been suggested as therapy for celiac disease, but the enzymes tested do not function at gastric pH, and are efficiently degraded by pepsin. Researchers in the Netherlands have now evaluated a newly discovered prolyl endoprotease from *Aspergillus niger* (AN-PEP) as a potential treatment for celiac disease.

AN-PEP is active between pH 2 and pH 8, with peak activity at pH 4–5. The enzyme retains its activity after incubation for 60 min at pH 2, and is resistant to pepsin degradation. Intact gluten is degraded effectively by AN-PEP, and gluten peptides are digested 60 times faster by AN-PEP than by a prolyl oligopeptidase. Almost all gluten-derived immunostimulatory peptides are destroyed by AN-PEP, and the T-cell stimulatory properties of a pepsin/trypsin digest of gluten are eliminated or greatly reduced by AN-PEP.

The authors conclude that AN-PEP is active throughout the pH range encountered in the human digestive tract. AN-PEP's pepsin resistance, high catalytic rate, activity against intact gluten and effectiveness against immunostimulatory peptides make it a promising candidate for clinical trials to evaluate oral AN-PEP supplementation in the treatment of celiac disease.

Original article Stepniak D *et al.* (2006) Highly efficient gluten degradation with a newly identified prolyl endoprotease: implications for celiac disease. *Am J Physiol Gastrointest Liver Physiol* **291:** G621–G629

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