Assessment of concordance between HRM + pHmetry, and barium swallows

Introduction To determine the sensitivity and specificity of barium swallow in reference to the gold standard HRM + 24 hour pH studies to identify abnormalities in peristalsis, lower oesophageal sphincter (LOS) relaxation and detection of gastro-oesophageal reflux (GOR) in symptomatic patients. Concordance of oesophageal peristalsis and LOS relaxation between conventional oesophageal manometry and barium swallow has been well documented in synchronous and asynchronous studies. However, research comparing barium swallow and oesophageal HRM is limited and there is sparse data evaluating the ability of barium studies to detect GOR in comparison to 24 hour pH studies.

Methods 88 patients with GOR and/or dysphagia uncontrolled by medication, who have undergone HRM +/- 24 hour pH studies and a barium swallow within 12 months of each other, were identified. Consecutive patients were selected upon referral to Northern General Hospital between February 2018 and June 2019, with the exception of those without a gastroscopy to rule out structural abnormalities and those who have a history of upper gastrointestinal surgery. Of the 88 patients initially included in the study, data for 48 subjects was available to be blindly reviewed. The barium swallow images were then blindly reviewed by a consultant radiologist and oesophageal manometry + 24 hour pH results were reviewed by a clinical scientist to determine if inter-observer variability is a confounding variable.

Results 88 patients met inclusion criteria; of which we had available data on peristalsis for 88, data on LOS relaxation for 85 and reflux for 72. Referenced to HRM, barium swallow indicated 40% sensitivity and 53% specificity for identifying abnormal peristalsis, 61% sensitivity and 98% specificity for detecting abnormal LOS relaxation and 51% sensitivity and 72% specificity for detecting reflux. When assessing concordance between the reviewed manometry and barium swallows, there was little change within the peristalsis and reflux parameters, with the greatest change observed for LOS relaxation.

Conclusion In this tertiary centre, concordance between HRM and barium swallow is poor, and specifically, barium swallow is lacking in ability to identify abnormalities in oesophageal peristalsis and the reviewed data suggests that inter-observer variation is a factor causing discrepancies in the assessment of LOS relaxation. Further, in those patients whose results were changed when reviewed, these changes are unlikely to have affected their clinical management.