Trends of High-Resolution Manometric Findings in Patients of Esophageal Motility Disorders at Liver Centre of a Tertiary Care Health Facility


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Abstract

Background: High-resolution esophageal manometry, a reliable diagnostic technique compared to conventional manometry, is being used by and large internationally but is unfortunately rare at our national level. This study assessed the trends of high-resolution manometric findings in patients having esophageal motility disorders at a public care health facility of Rawalpindi, Pakistan.

Method: This descriptive case series was conducted at Liver centre of Holy Family Hospital, on all 26 patients with complaints of esophageal motility disorders and undergoing high-resolution manometry from November 2015 to August 2016. Information was extracted from complete manometric reports of the patients. The data was entered and analysed using SPSS version 22 and descriptive analysis was performed to assess the trends of manometric findings.

Results: Out of 26 patients who had undergone manometry, majority of the study participants presented with dysphagia 20(76.92%), followed by vomiting 2(7.69%), heartburn 2(7.69%) and hiatal hernia 1(3.84%). 8% of the patients were diagnosed as Achalasia type 1, 52% as Achalasia type 2, 4% as Achalasia type 3 and 21.05% as Gastroesophageal Reflux Disease (GERD). Majority (80%) of the study population were diagnosed via manometry, 100% for hiatal hernia and heartburn each, 80% for dysphagia and 50% for vomiting.

Conclusion: The high resolution manometry has led to the confirmation of diagnoses of approximately eighty percent of our study population proving it to be currently available best technique for the diagnosis of esophageal motility disorders and majority of the patients showed the general trends of Lower Esophageal Sphincter Pressure (LESP) and peristalsis explained for different diseases.

Key Words: Manometry, findings, trends, Dysphagia, Achalasia, esophageal motility disorders, Gastroesophageal reflux

Introduction

High-resolution esophageal manometry is one of the reliable techniques for the diagnosis of esophageal motility disorders. Manometric techniques measure the amplitudes and timing of the pressure changes that, in general, reflect the force and timing of the circular muscle contraction or relaxation.1,2 It is basically a diagnostic system that measures intraluminal pressure activity in gastrointestinal tract using a series of closely spaced pressure sensors. Esophagus can be affected by a variety of conditions which present with a variety of symptoms making diagnosis difficult. Manometry is indicated for difficulty in swallowing, heart burn, GERD, epigastric discomfort, noncardiac chest pain, prior to antigastric reflux surgery, epigastric discomfort etc.3 Manometry has been developed to help in diagnosing patients with negative endoscopic findings.4 An Indian study conducted to evaluate the clinical importance of manometry established manometry to be first order of choice for diagnosing patients with dysphagia.5 According to an audit done in June 2015, high resolution manometry is considered to be gold standard investigation for confirming the diagnosis of esophageal motility disorders, another study done in November 2000 also proved it to be gold standard for diagnosing hypertensive lower esophageal sphincter.6,7 Research has also proved that high-resolution manometry has improved the diagnosis of achalasia compared to conventional manometry and contributes to better clinical outcomes.8 A Spanish study established that manometry should be routinely performed after excluding any organic esophageal disease.9
We did not come across any documented study evaluating manometric findings in patients having esophageal motility disorders at local or even national level. Being a recent diagnostic technique in Pakistan, no substantial research has evaluated the importance of high-resolution manometry in improving the diagnosis and management of patients with esophageal motility disorder. Hence, this foremost study was conducted in Pakistan to establish the importance of manometric findings in patients with esophageal motility disorders. In Pakistan, Centre for Liver Diseases (CLD), Holy family Hospital Rawalpindi is the only government facility to presently carry out High-Resolution Manometry. We conducted this study to determine the manometric findings in the patients undergoing High Resolution Manometry (HRM) in Centre of Liver Disease and also to assess the trends of manometric findings in different conditions causing esophageal motility disorders and the yield of manometry in these patients.

patients and Materials
We conducted this descriptive case series study in Centre of Liver and Gastrointestinal Disease, Holy Family Hospital, Rawalpindi from November 2015 to August 2016. We included all the patients who had undergone High Resolution Manometry during the mentioned time duration. In our study, only patients of esophageal motility disorders with negative endoscopic findings who had undergone manometry in CLD were included. We extracted information from available data at CLD, after approval from the Institutional Research Forum of RMC. We went through the manometric reports of patients with different esophageal motility disorders and filled our structured proformas accordingly. All the data was entered and analyzed using SPSS version 22 and descriptive statistics such as frequencies and percentages were presented for categorical variables like gender, presenting complaints and type of diagnosis etc. For continuous variables like age and pressures of lower esophageal sphincter pressure mean, modes, ranges, highest and lowest values along with standard deviations were calculated.

Results
Out of 26 patients who had undergone manometry, 12 (46.15%) were males and 14 (53.84%) were females. Mean age of study sample was 28.84 ± 9.42 years; youngest being 15 years while oldest 46 years. 20 (76.92%) of the study participants presented with complaint of dysphagia, 2 (7.69%) with vomiting, 2 (7.69%) with heart burn and 1 (3.84%) with hiatal hernia. The mean duration of illness of patients was 27.14 ± 23.57 months. Figure 1 shows distribution of indications according to gender of patients.

When these indications were observed according to the age groups of the patients all the patients who presented with hiatal hernia belonged to youngest age group i.e. 15-19 years. Vomiting was also observed in patients up to 25 years of age and heartburn above 24 years age group where dysphagia was almost uniformly distributed in all age groups. The distribution of indications is displayed in table 1. Table 2 shows the percentage of patients presenting with different complaints showing different trends of LESP. Out of the 20 patients who presented with dysphagia, 15 (75%) patients showed ineffective peristalsis (<80% peristaltic contractions), 1 (50%) out of 2 patients who presented with vomiting showed ineffective peristalsis and similarly 1 (50%) out of 2 patients of heart burn showed ineffective peristalsis. Yield of manometry according to our study was as follows: 8% of our patients were diagnosed as achalasia type 1, 52% were diagnosed as achalasia type 2, 4% were diagnosed as type 3 and 16% were diagnosed as GERD.

Achalasia is characterised by absence of peristalsis and impaired relaxation of lower oesophageal sphincter (LES). It is subdivided into different types according to high resolution manometry. Type 1 is achalasia with minimal oesophageal pressurization, type 2 is achalasia with oesophageal compression and type 3 is achalasia with spasm. Figure 3 shows difference of mean lower esophageal sphincter pressures between achalasia type 1, 2 & 3 in our study population. GERD stands for gastroesophageal reflux disease. It is a chronic condition of mucosal damage caused by stomach acid coming up from the stomach into the stomach. 100% of GERD patients had hypotensive LES (<10 mmHg), 100% had ineffective peristalsis (< 80% peristaltic contractions) and 25% had retrograde contractions. Table 3 shows trends of pressures at LES and peristalsis in 4 patients of GERD. Percentage of patients diagnosed with the help of high resolution manometry i.e. yield of high resolution manometry was 80%.

![Fig. 1: Indications in patients based on gender.](image-url)
introduced at other public health care facilities as of patients with a LTS whereas 4,5 introduce High resolution manometry is a relatively newly diagnostic technique in Pakistan. An Indian and Scandinavian study conducted on similar topics had sample sizes as 255 and 303 respectively whereas our study was conducted on a much smaller sample as this technique has very recently been introduced in Pakistan.4,5 Majority of our subjects presented with dysphagia i.e. 76.92% whereas a study on Indian population displayed that the commonest presenting complaint was heartburn, where only 7.69% of our patients presented with heartburn as their complaint.25 Out of all dysphagic patients in our study 93.75% had ineffective peristalsis whereas an Indian study had 9.67% of dysphagic patients with ineffective peristalsis.5 55.26% of dysphagic patients according to another Indian research were diagnosed to have achalasia whereas in our study, 80% of the dysphagic patients had achalasia, a figure much larger than the former.5,10 The proportions of patients with achalasia were observed to 53.7%, 99% 77% and 65.4% in Spanish, American, North Indian and Sudani population respectively whereas our study observed 64% of study population with aca lasia.9,10,12,13 52% of our patients had type II achalasia, comparable to 49% of American subjects.10 16% of our population was diagnosed with GERD inconsistent to 50% of Sudani study.12 29.67% of the GERD patients had hypotensive LES in the Indian study (<10 mmHg) whereas 100% of our GERD population had hypotensive LES.5 Overall 80% of the patients were diagnosed by High Resolution Manometry in our research in concordance with 82% in Scandinavian study.4 Studies have shown esophageal manometry to be a useful and cost effective test in patients with symptoms of dysphagia, non-cardiac chest pain or gastrointestinal reflux disease.14,16 The diagnostic importance of high resolution manometry is now so well established that it is now hailed as a gold standard for the diagnosis of esophageal motility disorders. Hence, it would be highly beneficial to increase the practice of using high resolution manometry as a diagnostic technique for esophageal motility disorders. Furthermore, this technique should be introduced at other public health care facilities as well.

**Discussion**

High resolution manometry is a relatively newly introduced diagnostic technique in Pakistan.4,5 Its importance as a diagnostic tool has been well established and Holy Family Hospital, Rawalpindi is the “first” public health care facility to introduce this technique in Pakistan. An Indian and Scandinavian study conducted on similar topics had sample sizes as 255 and 303 respectively whereas our study was conducted on a much smaller sample as this technique has very recently been introduced in Pakistan.4,5 Majority of our subjects presented with dysphagia i.e. 76.92% whereas a study on Indian population displayed that the commonest presenting complaint was heartburn, where only 7.69% of our patients presented with heartburn as their complaint.25 Out of all dysphagic patients in our study 93.75% had ineffective peristalsis whereas an Indian study had 9.67% of dysphagic patients with ineffective peristalsis.5 55.26% of dysphagic patients according to another Indian research were diagnosed to have achalasia whereas in our study, 80% of the dysphagic patients had achalasia, a figure much larger than the former.5,10 The proportions of patients with achalasia were observed to 53.7%, 99% 77% and 65.4% in Spanish, American, North Indian and Sudani population respectively whereas our study observed 64% of study population with aca lasia.9,10,12,13 52% of our patients had type II achalasia, comparable to 49% of American subjects.10 16% of our population was diagnosed with GERD inconsistent to 50% of Sudani study.12 29.67% of the GERD patients had hypotensive LES in the Indian study (<10 mmHg) whereas 100% of our GERD population had hypotensive LES.5 Overall 80% of the patients were diagnosed by High Resolution Manometry in our research in concordance with 82% in Scandinavian study.4 Studies have shown esophageal manometry to be a useful and cost effective test in patients with symptoms of dysphagia, non-cardiac chest pain or gastrointestinal reflux disease.14,16 The diagnostic importance of high resolution manometry is now so well established that it is now hailed as a gold standard for the diagnosis of esophageal motility disorders. Hence, it would be highly beneficial to increase the practice of using high resolution manometry as a diagnostic technique for esophageal motility disorders. Furthermore, this technique should be introduced at other public health care facilities as well.

**Conclusion**

The High Resolution manometry has led to the confirmation of diagnoses of approximately eighty
percent of our study population proving it to be currently available best technique for the diagnosis of esophageal motility disorders. All the patients showed the general trends of LESP and peristalsis.

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References