

## CLINICAL AND MANOMETRIC PROFILE EVALUATION OF PATIENTS WITH GASTRO ESOPHAGEAL REFLUX DISEASE (GERD)

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### ABSTRACT

**Background:** Gastro Esophageal Reflux Disease (GERD) has a high prevalence all over the world, and this disease has considerable geographical variation. GERD may act as a significant risk factor in the etiopathogenesis of esophageal adenocarcinoma and Barrett's esophagus. **Material & Methods:** In the present study 100 patients of both sexes of age between 20-65 years were included in the study after obtaining ethical clearance. Patients who were presented with symptoms of heartburn or acid regurgitation (GERD) for at least more than three months were included in the study after obtaining their informed written consent. **Results:** Out of total patients 64 were males, and 36 were females with their mean age of  $42.18 \pm 14.53$ . Their clinical presentations were heartburn (52.8%), acid regurgitation (36.4%), chest pain (19.3%), nausea and vomiting (6.7%). Among 100 study participants diagnosed with GERD 30% were reported to have ineffective esophageal motility and out of them only 9% had low LES pressure. Among 30 study participants diagnosed with ineffective esophageal peristalsis 38.7% reported to have failed peristalsis, and 61.3% study participants had weak peristalsis. **Conclusion:** Ineffective or abnormal esophageal motility was higher than the low pressure of LES inpatients had GERD. Hence, Ineffective esophageal motility and Hypotensive sphincter were the leading cause for GERD and also not always correlated with esophagitis.

**Keywords:** High-Resolution Manometry, Ineffective peristalsis, esophageal adenocarcinoma, Barrett's esophagus.

### INTRODUCTION

Gastro Esophageal Reflux Disease (GERD) has a high prevalence all over the world, and this disease has considerable geographical variation. The approximate prevalence rate was found too high up to 28% in the US and up to 26% in Europe, and also higher prevalence observed in Asian countries (1). GERD compromise subjects' quality of living because of symptomatic pain and discomfort. GERD may act as a major risk factor in the etiopathogenesis of esophageal adenocarcinoma and Barrett's esophagus (2).

Abnormal oesophageal motility act as the primary risk among numerous risk factors which constitute the etiopathogenesis of GERD and also linked with disease severity and prognosis (3). Abnormal oesophageal motility leads to delayed clearance of the reflux contents which leads to prolonged mucosal exposure to highly acidic gastroduodenal contents which results in esophagitis and other complications. Ineffective esophageal peristalsis is also reported higher, and Prevalence was found as high as 40-50% among patients with GERD (4).

However, esophageal motility patterns were found to vary in different subclasses of GERD cases. Patterns with abnormal motility and with low LES pressure are more likely to be associated with endoscopic esophagitis as found in GERD patients (5). High-Resolution Manometry (HRM) of the esophagus is an advanced procedure which gives a glance of change in intraluminal pressure and as well as the motor activity of the esophagus while swallowing from upper to lower esophageal sphincter (6).

Further studies should be warranted to evaluate the role of abnormal motility in patients with GERD. Hence, we conducted a present study to find out the association of abnormal esophageal motility and pressure at low basal Lower Esophageal Sphincter (LES) with High-Resolution Manometry and also endoscopic findings in study patients with GERD.

## **MATERIALS & METHODS**

The present study was conducted in our tertiary care hospital, in the department of general medicine. One hundred patients of both genders of 20-65 years of age were enrolled for the present study after obtaining institutional ethical clearance. Patients who were presented with symptoms of heartburn or acid regurgitation (GERD) for at least more than three months were included in the study after obtaining their informed written consent. Patients with previous history of previous gastric or esophageal surgery, previous history of esophageal or fundic varices, collagen diseases, previous history of ingestion of corrosive agents, esophageal cancer, achalasia, acute cardiovascular, respiratory, digestive tract or metabolic diseases were excluded. Patients on proton pump inhibitors were to instructed to with hold the medicine for three weeks before the procedure. Patients were further categorized into two groups on the basis of erosive and non-erosive reflux disease according to the endoscopic findings. Patients were also instructed to discontinue drugs for 48hours before the manometry such as calcium-channel blockers and nitrates which may affect esophageal motor function. The data were collected and organized using MS Excel spread sheet, software Epi Info v7 and SPSS v22.

## **Manometry procedure**

Manometry was performed using a 16-channel water perfused catheter which had eight channels placed at 1 cm distance at the lower end, and the remaining eight channels were placed at a 3cm distance. The catheter was introduced via a transnasal route. Basal LES pressure was measured for 1 minute, which is continued by ten wet swallows of 5 ml at a gap of 30seconds. Above stated ten wet swallow frames represents the contraction and relaxation of upper and lower esophageal sphincter. Which were represented as isobaric colour contour presentation? Spatial and temporal findings of esophageal motor activity were made. Tests swallows were classified based upon HRM data using the Chicago classification. According to Chicago classification it is considered as ineffective esophageal motility, when >50% of swallows are ineffective, that is either failed (Distal Contractile Integral <100 mm of Hg/cm/sec) and weak (Distal Contractile Integral = 100-450 mm of Hg/cm/sec) (7).

## **RESULTS**

In the present study, all 100 patients with GERD were enrolled for endoscopy and followed by esophageal manometry. Out of these 64 were males and 36 were females with their mean age of  $42.18 \pm 14.53$ . Six of the patients had a hiatus hernia. Their clinical presentations were heartburn (52.8%), acid regurgitation (36.4%), chest pain (19.3%), nausea and vomiting (6.7%). Among 100 study participants diagnosed with GERD 30% were reported to have ineffective esophageal motility and out of them only 9% study participants had low LES pressure. 03% of patients with GERD had both ineffective esophageal motility and low LES pressure. Among 30 study participants diagnosed with ineffective esophageal peristalsis 38.7% reported to have failed peristalsis, and 61.3% study participants had weak peristalsis. Ineffective esophageal motility was also found to be more common among older age group individuals with their mean age being  $46.54 \pm 12.84$ . On upper GI endoscopy findings, out of total 73 study participants had erosive reflux disease, and 27 study participants had non-erosive reflux disease. In the categorized subgroup of study participants with erosive reflux

disease, six study participants represents with low LES pressure, and 22 study participants had IEM, and this association was not statistically significant (Table 1).

**Table No.1: Association between manometric profile and endoscopic findings.**

Manometric profile	Endoscopic findings		P value
	Non-erosive reflux disease	Erosive reflux disease	
Normal lower esophageal sphincter pressure (%)	24	67	.458
Low Lower esophageal sphincter pressure (%)	03	06	
Normal esophageal motility (%)	20	50	.846
Ineffective esophageal motility (%)	08	22	

## DISCUSSION

In the present study, abnormal esophageal motility was observed to be higher when compared with low basal LES pressure. However, in a study conducted among similar patient history it was reported that low basal LES pressure along with decreasing amplitude and abnormal peristaltic waves in the distal esophagus was more likely to be associated with GERD patients (8). Kruse-Anderson et al. observed in their study conducted among GERD patients increased fewer and low amplitude propagative peristalsis when compared with controls (9).

Transient Lower Esophageal Sphincter Relaxations and Abnormal Esophago Gastric Junction and anatomic distortion of Esophago Gastric Junction, hypotensive Lower Esophageal Sphincter (LES) and ineffective esophageal peristalsis are found to be the

main risk factors for the reflux of gastric acidic contents into the esophagus. We observed in the present study that ineffective esophageal motility was contributing to be the main significant abnormality found in GERD patients than low pressure of LES. Since esophageal peristalsis is the major protective mechanism for gastric reflux which governs the clearance of acidic contents. A study conducted by Savarino et al. also results that ineffective esophageal motility, low LES pressure and hiatus hernia were observed to be more common in GERD patients than patients had functional heartburn and controls (10). Several researches also published the result that GERD and its complications were tends to more frequently associated with patients with absent peristalsis and scleroderma patients which indicated the role of esophageal clearance in the etiopathogenesis of GERD (11).

It was also observed in recent studies that dysphagia or reflux means impairment of esophageal functions were found to be more frequent among older patients which starts from 40 years and more. In the present study, we found that increased occurrence of ineffective or abnormal esophageal motility is also common in older patients. Gutschow et al. among patients with and without GERD had reflux symptoms found that there was a statically significant decrease in peristaltic function with relation to age of patients and it is more prevalent in older than in younger patients (12).

In the present study low pressure of LES was observed higher among patients had erosive reflux disease than in patients had non-erosive reflux disease. A study conducted by Frazzoni et al. conducted among patients with GERD had found lower LES pressure in patients with non-erosive and erosive reflux disease compared with controls (13). Both low LES pressure and ineffective peristalsis was reported to be affected in reflux esophagitis. Somani et al. found that the severity of esophagitis is inversely related with contraction amplitudes of the distal esophagus (14). In the present study, ineffective esophageal motility was observed higher among patients who had erosive reflux disease when compared with non-erosive reflux disease. Daum et al. reported that peristaltic dysfunction is of 56% in non-erosive reflux disease and 76% in patients had erosive reflux disease, they

also found that esophageal motility abnormality was observed to be higher in GERD patients by using HRM method than with conventional manometry procedure (15). In contrast Lemme et al. found that there was no difference seen in the prevalence of ineffective motility among non-erosive and erosive GERD patients (16). Simren et al., also reported that ineffective motility had little effect on esophageal clearance of acid reflux and only severe esophageal motility disorders were linked with prolonged esophageal reflux clearance in those had supine reflux (17).

## CONCLUSION

We concluded Based on the results of the present study that, Ineffective or abnormal esophageal motility was higher than low pressure of LES inpatients had GERD. Hence, Ineffective esophageal motility and Hypotensive sphincter were the main cause for GERD and also not always correlated with esophagitis.

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