



E-ISSN: 2616-3470
P-ISSN: 2616-3462
© Surgery Science
www.surgeryscience.com
2019; 3(1): 132-135
Received: 11-11-2018
Accepted: 02-12-2018

Dr. Sabayya Bhovi
Senior Resident, Department of
Surgery, GIMS, Kalaburagi,
Karnataka, India

Dr. Jagadish Kumar CD
Consultant, Mysore, Karnataka,
India

Histopathological and endoscopic study of GERD patients

Dr. Sabayya Bhovi and Dr. Jagadish Kumar CD

DOI: <https://doi.org/10.33545/surgery.2019.v3.i1c.24>

Abstract

The Gastro esophageal reflux is a normal physiologic phenomenon experienced intermittently by most people, particularly after a meal. Gastro esophageal reflux disease (GERD) occurs when the amount of gastric juice that refluxes into the esophagus exceeds the normal limit, causing symptoms with or without associated esophageal mucosal injury. From the endoscopically diagnosed GERD patients Four quadrant biopsies were taken 2 cm from the GE junction and not more than 2 cm apart from each other. Then Chromoendoscopy was performed by spraying 0.4% solution of the indigo carmine through a catheter and the patterns formed was documented through a higher resolution endoscope as a rigged/villous circular, irregular/distorted pattern and biopsies were taken from these places. Our study shows that the yield of chromoendoscopy (indigo carmine) and its directed biopsy was far superior to the conventional endoscopy and four quadrant biopsy. In appropriate clinical setting, chromoendoscopy can be used as a diagnostic technique for diagnosing Barrett's esophagus.

Keywords: Chromoendoscopy, Gastro esophageal reflux disease, GE junction

Introduction

The Montreal consensus conference defined GERD as “a condition which develops when the reflux of gastric contents causes troublesome symptoms and/or complications”. However, this definition did not include details of the pathophysiology of the disease and its implications for treatment. The Brazilian consensus conference considered GERD to be “a chronic disorder related to the retrograde flow of Gastro-duodenal contents into the esophagus and/or adjacent organs, resulting in a spectrum of symptoms, with or without tissue damage”^[1].

This definition recognizes the chronic character of the disease, and acknowledges that the refluxate can be gastric and duodenal in origin, with important implications for the treatment of this disease. The Gastroesophageal reflux is a normal physiologic phenomenon experienced intermittently by most people, particularly after a meal. Gastroesophageal reflux disease (GERD) occurs when the amount of gastric juice that refluxes into the esophagus exceeds the normal limit, causing symptoms with or without associated esophageal mucosal injury (i.e.-esophagitis). Gastroesophageal reflux disease, with hallmark symptoms of heartburn and acid Regurgitation, is a common disorder, affecting up to 60% of persons at some time during the course of a year, 20 to 30% of persons at least weekly and 7-10% of the adult population on a daily basis. Frequent or severe symptoms of gastroesophageal reflux disease are associated with time lost from work and impaired health related quality of life (HRQOL) further emphasizing the clinical significance of this entity^[2]. In addition to quality of life issues, the numerous complications of chronic GERD, such as esophageal stricture formation, Barrett's esophagus and esophageal adenocarcinoma, necessitate adequate diagnosis and treatment of this common entity. The impact of GERD on HRQOL in affected individuals is proportional to the frequency and severity of heartburn, and is greater than that associated with many other chronic diseases. The prevalence of GERD is estimated to be 10% to 20% in Europe and North America and 5% in Asia. The incidence rate, reported by two longitudinal studies, was 4.5 and 5.4 per 1000 people per year, respectively.

Correspondence
Dr. Jagadish Kumar CD
Consultant, Mysore, Karnataka,
India

The diagnosis and treatment of GERD are therefore, important because the disease, in addition to the highly disturbing typical symptoms, has a series of known consequences. An important concept emerging from the consensus process is that of GERD being a spectrum disease that can run from symptomatic GERD through the potential complications of esophagitis, hemorrhage and stricture formation, to Barrett's esophagus and esophageal adenocarcinoma [3, 4].

The GERD disease spectrum-GERD without endoscopically visible esophageal injury, Esophagitis, Hemorrhage, stricture formation, Barrett's esophagus, esophageal adenocarcinoma.

With an emphasis on morphological diagnosis, endoscopy has become a major tool to assess the final consequences of GERD, which is especially useful for population- based screening. Endoscopic screening for Barrett's esophagus and esophageal adenocarcinoma has been recommended for patients with classic and chronic symptoms of Gastroesophageal reflux disease (GERD). The endoscopic esophageal changes caused by reflux disease are not only helpful diagnostically, but also identify patients exposed to a significant risk of disease chronicity [5].

Methodology

Source Of Data: Patients present to OPD complaining GERD symptoms

Sample Size: 200 patients with GERD symptoms

Study Design: Descriptive study.

Methodology: 200 patients satisfying one inclusion criteria attending the OPD Hospital underwent treatment with PPI for 4 weeks and then were subjected to Endoscopy and Biopsy using a PENTAX EPK-700 Endoscope. The Gastroesophageal junction was first identified (in cm) by taking the upper incisor teeth as a reference point. The presence of endoscopic evidence such as redness, ulcers, lax lower esophageal sphincter, poor esophageal clearance, delayed gastric emptying, bile reflux, columnar epithelium were noted. From this endoscopically diagnosed GERD patients Four quadrant biopsies were taken 2 cm from the GE junction and not more than 2 cm apart from each other. Then Chromoendoscopy was performed by spraying 0.4% solution of the indigo carmine through a catheter and the patterns formed was documented through a higher resolution endoscope as a rigged/villous circular, irregular/distorted pattern and biopsies were taken from these places. Biopsies were transported in 10% formalin solution and was subjected to HPE for evidences of BE by a single expert pathologist. The presence of HPE evidence of columnar epithelium, intestinal metaplasia, dysplasia and its grading was documented.

Statistical Methods Used

- Descriptive statistics
- Contingency table analysis
- Chi square test

Results

Table 1: Four quadrant biopsy yield among patients with symptoms

Biopsy Findings	No	Percentage
Intestinal Metaplasia	9	4.5
Gastric Metaplasia	2	1
Dysplasia	2	1
N=84		

Table 2: Chromoendoscopy biopsy yield among patients with symptoms

Biopsy Findings	No	Percentage
Intestinal Metaplasia	18	9
Gastric Metaplasia	6	3
Dysplasia	4	1

Table 3: Correlation of Regurgitation with endoscopic findings

	GERD Lesion Present	GERD Lesion Absent	
Regurgitation Present	64	52	116
Regurgitation Absent	20	64	84
	84	116	200

X² = 19.6726 P value = 9E-06 (<0.05)

Table 4: Correlation of Heart Burns with endoscopic findings

	GERD Lesion Present	GERD Lesion Absent	
Heart Burns Present	54	38	92
Heart Burns Absent	30	78	108
	84	116	200

X² = 19.495 P value = 1E-05 (<0.05)

Table 5: Correlation of Heart Burns with endoscopic findings

	GERD Lesion Present	GERD Lesion Absent	
Dysphagia Present	30	50	80
Dysphagia Absent	54	66	120
	84	116	200

X² = 1.1084 P value = 0.2924 (>0.05)

Table 6: Correlation of Water Brush with endoscopic findings

	GERD Lesion Present	GERD Lesion Absent	
Water brush Present	38	12	50
Water brush Absent	46	104	150
	84	116	200

X² = 31.6366 P value = 0 (<0.05)

Table 7: Correlation of Global Sensation with endoscopic findings

	GERD Lesion Present	GERD Lesion Absent	
Global sensation Present	32	38	70
Global sensation Absent	52	78	130
	84	116	200

X² = 0.6099 P value = 0.4348 (>0.05)

Table 8: Correlation of Bloating Abdomen with endoscopic findings

	GERD Lesion Present	GERD Lesion Absent	
Bloating Abdomen Present	28	48	76
Bloating Abdomen Absent	56	68	124
	84	116	200
$X^2 = 1.3387$			

P value = 0.2472 (>0.05)

Table 9: Correlation of Belching with endoscopic findings

	GERD Lesion Present	GERD Lesion Absent	
Belching Present	54	34	88
Belching Absent	30	82	112
	84	116	200
$X^2 = 24.1875$			

P value = 1E-06 (<0.05)

Table 10: Comparison between Chromoendoscopy biopsy with endoscopic biopsy

	Endoscopic Biopsy +	Endoscopic Biopsy -	
Chromoendoscopy biopsy +	10	14	24
Chromoendoscopy biopsy -	1	59	60
	11	73	84

 $X^2 = 24.1016$ P value = 1E-06 (<0.05)

Discussion

Our study shows that the yield of chromoendoscopy (indigo carmine) and its directed biopsy was far superior to the conventional endoscopy and four quadrant biopsy. In appropriate clinical setting, chromoendoscopy can be used as a diagnostic technique for diagnosing Barrett's esophagus. Chromoendoscopy is simple, safe and requires minimal additional time and its use in surveillance requires further studies.

The results of a similar study by Zuberi Badar Faiyaz *et al.* at Lyari General Hospital, Dow University of Health Sciences, Pakistan are as follows. A total of 196 patients were selected and endoscopically examined. Most common grade given by patients to epigastric pain was grade-4 (42.9%), retrosternal burning as grade-4 (41.8%) and reflux grade-5 (36.7%). There was significant correlation between the clinical severity of epigastric pain with endoscopic findings and reflux but no correlation was observed with histological findings. Out of 109 (55.6%) patients who had normal mucosa on endoscopy but on histology 70 (35.7%) of them had inflammation. Grading of endoscopic and histological findings showed significant correlation with each other. The conclusion was that endoscopic negative GERD is common; severity of clinical symptoms does not correlate with endoscopic findings while histopathological findings correlate with those of endoscopic findings [6].

Studies from Ewha Womans University, Seoul, Korea by Hyun Joo Song *et al.* shows that heartburn of moderate to severe degree was a universal complaint and frequency of regurgitation was noticed to be more than thrice a week to daily intermittent in all the patients. Hiatus hernia was seen in 26/146 (17.8%). Out of 89 (60%) endoscopic positive GERD patients 82% had

Grade A or B esophagitis lesions while only 2 patients had grade D lesions. H. Pylori by RUT on gastric biopsies was found in 64% patients. The symptom scores did not correlate with the severity of esophagitis. HP positive and negative patients had similar symptoms and endoscopy profile [7].

Sharma P *et al.*, in his study found Chromoendoscopy using indigo carmine as a useful clinical tool for the increased detection of patients with intestinal metaplasia as well as for surveillance of patients for the detection high grade dysplasia [8]. Kara M A *et al.* from their study concluded that high resolution chromo-endoscopy with indigo carmine to be more sensitive in detecting Dysplasia and Metaplasia in Barrett's when compared to narrow band imagin [9].

Bregman J *et al.* recommend chromo-endoscopy as a useful adjunct to high resolution endoscopy for precise delineation and characterization of lesion and for possible detection of occult lesion [10].

According to Markku Voutilainen *et al.*, in a study conducted at Helsinki University Hospital, Helsinki, Finland, of the 248 GERD patients, 81 (33%) had endoscopy-negative GERD, but of those aged <50 years (n = 67), 57 (85%) were endoscopy-negative. The correlation between reflux symptoms and endoscopy-positive GERD is poor and most GERD patients aged <50 years have endoscopy-negative GERD. The use of NSAIDs is a risk factor for GERD, whereas chronic gastritis, but not H. Pylori infection, may protect against GERD. Incomplete intestinal metaplasia at the gastroesophageal junction was associated with GERD [11]. In another study from Karstula Health Care Center, Finland by Mantynen T *et al.*, of the 760 patients who underwent endoscopy because of heartburn or regurgitation, 254 (33.4%) had endoscopy positive (erosive) GERD, 11 (1.4%) BE (one with esophageal adenocarcinoma), six (0.8%) esophageal ulcer, and one peptic esophageal stricture (0.1%) [12].

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In appropriate clinical setting, chromoendoscopy can be used as a diagnostic technique for diagnosing Barrett's esophagus. Chromoendoscopy is simple, safe and requires minimal additional time and its use in surveillance requires further studies.

Richter JE, in his study found 93% of the patients with evidence of columnar epithelium in the endoscope and had intestinal metaplasia histopathologically but 15% population with no evidence of columnar epithelium endoscopically had intestinal metaplasia. Histopathology was considered the gold standard for confirmation of Barrett's esophagus in their conclusion from the study.

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Conclusion

- Most common associated finding in UGI Endoscopy for GERD patients is Hiatus Hernia (3%).
- Incidence 6.5% and 14% respectively.
- Our study shows that the yield of chromoendoscopy (indigo carmine) and its directed biopsy was far superior to the conventional endoscopy and four quadrant biopsy. In appropriate clinical setting, chromoendoscopy can be used as a diagnostic technique for diagnosing Barrett's esophagus.
- Chromoendoscopy is simple, safe and requires minimal additional time and its use in surveillance requires further studies.

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