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Original Research Paper

A Study on Prevalence and Progression of Barrett's Esophagus

Medical Science

KEYWORDS : Barrett's esophagus; Gastroesophageal reflux disease; Endoscopy; Histology; Dysplasia.

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ABSTRACT

Introduction: *The study was conducted to estimate the prevalence of Barrett's esophagus in patients with reflux symptoms, to assess the prevalence of dysplasia in Barrett's esophagus and to study the endoscopic and histopathological aspects of Barrett's esophagus.***Methods:** *A total of 79 patients were evaluated prospectively for symptoms compatible with GERD. In all cases, routine endoscopy and Prague Criteria of reporting of Barrett's esophagus were performed. In each subject biopsy was taken and assessed histologically.***Results:** *Endoscopically 35/79 had GERD, 28/79 had features of Barrett's esophagus and 7/79 had islands of columnar epithelium. Histologically, intestinal metaplasia with goblet cells was present in 33(41.8%) and 8/33 (24.2%) had low grade dysplasia.* **Conclusion:** *The prevalence of Barrett's esophagus was found to be 41.8% in patients with reflux symptoms and the prevalence of dysplasia in Barrett's was found to be 24.2%. Endoscopic and histological features of Barrett's esophagus were assessed in detail.*

INTRODUCTION

Barrett's Esophagus is defined by American College of Gastroenterology as an endoscopically recognizable columnar metaplasia of the esophageal mucosa that is confirmed pathologically to have intestinal metaplasia; the latter defined by the presence of goblet cells.[1] The term Barrett's esophagus is named after Norman Barrett, a thoracic surgeon of Guys Hospital in London.[2]

The condition develops as a consequence of chronic Gastroesophageal reflux disease(GERD) and predisposes to the development of esophageal adenocarcinoma. Approximately, 10 to 15% of patients with gastroesophageal reflux disease develop Barrett's esophagus.[3]

In Barrett's esophagus, the normal squamous epithelium is replaced by metaplastic epithelium.[4] It is important to recognize Barrett's esophagus in esophageal biopsies because of its premalignant potential. Esophageal biopsy and staining with Hematoxylin & Eosin and Alcian Blue is a reliable method of diagnosis. The progress of metaplastic epithelium is through a multistep process to low grade dysplasia, high grade dysplasia and ultimately to invasive cancer.

OBJECTIVES

- To study the endoscopic and histopathological aspects of Barrett's esophagus
- To estimate the prevalence of Barrett's esophagus in patients with symptoms of gastroesophageal reflux disease(GERD)
- To study the prevalence of dysplasia in Barrett's esophagus .

MATERIALS AND METHODS

The present study was carried out in the Departments of Pathology and Department of Gastroenterology of Sree Gokulam Medical College. A total of 79 patients were evaluated prospectively in the endoscopic unit of Gastroenterology department for symptoms compatible with GERD in a cross sectional study lasting from December 2011 to October 2013.

Cases were selected based on a validated questionnaire which included demographic features, risk factors and clinical features. A routine endoscopy was performed by the same gastroenterologist on all patients. Normally on endoscopy Z line is sharp and regular. There may be islands of columnar epithelium above the normal junction of the stomach and esophagus. Endoscopic Barrett's esophagus was graded and reported in accordance with Prague Criteria.5 Endoscopic pictures and reports were collected to know the macroscopic features. Biopsy was taken from 3cm above the squamocolumnar junction. The biopsy specimens were stained using H&E and with alcian blue at pH 2.5.

Histopathological features of Barrett's esophagus include both epithelial and mesenchymal changes in the esophagus.6 Crypt and surface epithelium, which may be flat, undulating or even villiform, is typically lined by mucinous columnar cell with scattered goblet cells, enterocytes and paneth cells.6 Intestinal metaplasia of esophagus is defined by the presence of goblet cells. Mesenchymal changes include duplication of muscularis mucosa.6

Prevalence of dysplasia in Barrett's was also looked for. Dysplasia was graded as negative for dysplasia, indefinite for dysplasia and positive for dysplasia(low grade or high grade dysplasia).6

STATISTICAL ANALYSIS

Data, entered in Microsoft excel, was filtered and coded. Data was analysed using SPSS version 16 (SPSS ¨C Statistical Package for Social Sciences). Simple proportions and chi square values with level of significance were evaluated and interpreted.

RESULTS

The mean age of the patients was 46.1+ 12.2 years. Among the 79 patients included in the study group 72.2% were males. 29.1% of the subjects were smokers and 40.5% were alcoholics. Majority of the patients presented with complaints of heart burn (84.8%) and regurgitation (75.9%).

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Nonerosive reflux disease, with normal endoscopic findings and typical symptoms of GERD, was present in only 5 patients. Endoscopic findings of GERD was present in 35/79(44.3%) patients, islands of columnar epithelium was present in 7/79(8.86%) and that of Barrett's was present in 28/79(35.4%). {Table 1}

Histological columnar metaplasia was present in 40(50.6%) subjects. Intestinal metaplasia with goblet cells was present in 33(41.8%) and were diagnosed as having Barrett's. Thus histological finding of Barretts was present in 33/79(41.8%) subjects.{Figure 1} Goblet cells were better demonstrated by Alcian blue stain.{Figure 2} 25.3% of subjects showed immature squamous metaplasia. Complete intestinal metaplasia with enterocytes and paneth cells were present in 15.2% of cases.

Out of the 33 patients with histological features of Barrett's esophagus, 25 were negative for dysplasia, none were diagnosed as indefinite for dysplasia, 8 (24.2%) had low grade dysplasia and none had high grade dysplasia. A diagnosis of adenocarcinoma was not given in any of the cases.

DISCUSSION

This study was conducted to know the prevalence and progression of Barrett's esophagus. On endoscopy, according to Prague Criteria5 of Barrett's esophagus, C1M2-3 was observed in 24 subjects and C2 and above in 4 subjects. Most of the people with endoscopic finding of Barrett's were also having histological finding of Barrett's. All patients with endoscopic diagnosis of C2 and above showed evidence of Barrett's esophagus histologically .

Of the 79 subjects with GERD symptoms, columnar metaplasia was present in 40(50.6%) subjects. However. intestinal metaplasia with goblet cells was present in 33(41.8%) and were diagnosed as having Barrett's. Goblet cells were better demonstrated by Alcian blue stain.

Thus in the present study, the prevalence of Barrett's esophagus was found to be 41.8% in patients with reflux symptoms. This prevalence rate is higher when compared to studies conducted by Punia et al7 in 2006 (23.6%), Askir et al8 in 2005 (22%), Bayrakci et al9 in 2008 and (2%) Dhawan et al10 in 2001 (6%),. The reported prevalence of Barrett's in India range from 2.6 – 23%.7,10-11 In 2014, Wani et al found a prevalence of 2.38% in India.12 The reason for higher prevalence in our study may be because we selected patients with severe reflux symptoms.

The prevalence of GERD in India is now higher than previous estimates and seems to be between 8-19%. This appears to be similar to that of the western countries.13-16 Although patients with GERD are at higher risk for Barrett's16, it is seen that the prevalence of Barrett's is low in India. However, with the new finding regarding the high prevalence of GERD in India, there is a renewed interest in revisiting the prevalence of complications of GERD such as Barrett's esophagus.

The prevalence of dysplasia in Barrett's was found to be 24.2%. None of our patients had high grade dysplasia or adenocarcinoma. This rate is higher when compared to study done by Sharma et al17 (prevalence of 8.5%) and Wani et al18(7.47%). However this rate is lower when compared to study done by Schnell TG et al19(prevalence of 74%). In the study by Punia et al, none had associated dysplasia but one of the patient had adenocarcinoma.

It is important to recognize Barrett's esophagus in esophageal biopsies because of its premalignant potential. Patients with clinical features of GERD have to be carefully evaluated for Barrett's esophagus, followed up and biopsy taken if indicated.

CONCLUSION

The prevalence of Barrett's esophagus was found to be 41.8% in patients with reflux symptoms and the prevalence of dysplasia in Barrett's was found to be 24.2%. Endoscopic and histological features of Barrett's esophagus were assessed in detail.

Table 1: Distribution of patients according to endoscopic findings

Endoscopic Feature	Number of patients	Percentage
Normal	5	6.3%
GERD	35	44.3%
Islands of CLE	7	8.86%
BE – C1M2-3	24	30.4%
BE – C2 & above	4	5.1%
Others	4	5.06%

GERD – Gastroesophageal reflux disease; CLE – Columnar lined esophagus BE - Barrett's esophagus; C – most proximal Circumferential extend of columnar metaplasia; M – Maximum extend of columnar metaplasia

Figure 1: Percentage (%) distribution of the study sample according to histological features of Barrett's esophagus

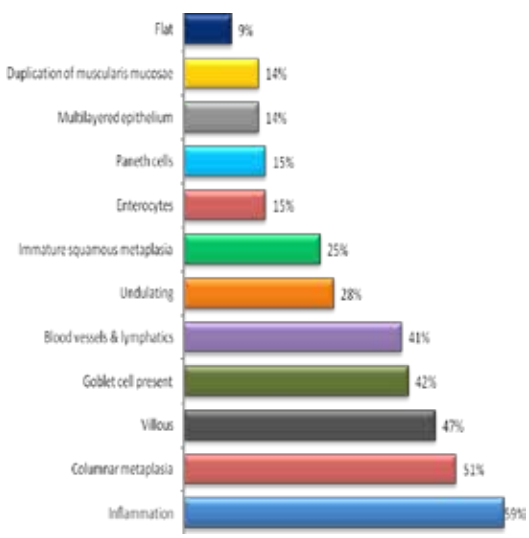
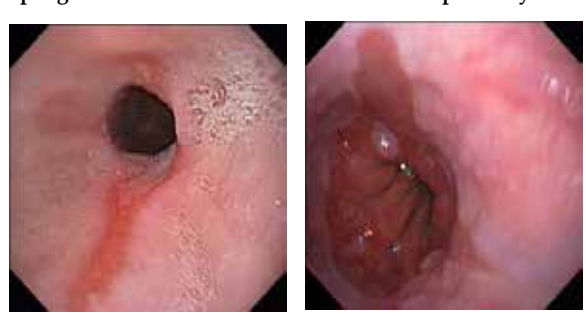
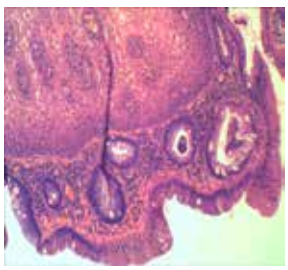
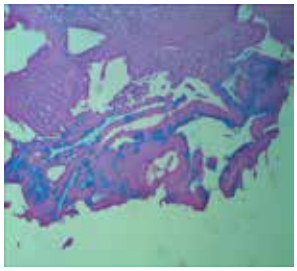


Figure 2: (a & b) Barrett's esophagus C1M3 & C2M3 respectively on endoscopy (c &d) A segment of Barrett's esophagus in H& E and Alcian blue stains respectively







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