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HISTOPATHOLOGICAL INTERPRETATION OF UPPER GASTROINTESTINAL (CARDIAC) ENDOSCOPIC BIOPSIES IN GASTROESOPHAGEAL REFLUX DISEASE

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Abstract

GERD has been thought to be a disease of the Western world. The prevalence rates had been estimated to be lower in Asia as compared to the Western countries. Some recent epidemiological studies in India showed the prevalence of reflux disease is in between 8% and 24%, which is comparable to the Western world. The impact of adaptation of 'western diet and lifestyle', increasing obesity, spicy food habits leads to increase in prevalence of Barrett's esophagus. This advancement has also resulted in better health education and awareness. Improved knowledge of the disease can result in an increased recognition of GERD; thereby causing an apparent increase in its prevalence.

With this study, we were able to study spectrum of upper gastro-esophageal cardiac biopsies in patients with reflux symptoms, epigastric pain & regurgitation, etc. We have analyzed the various histopathological patterns GERD in which most common was Barrett's esophagus, mild esophagitis, candidal and viral esophagitis, which is comparable with other Indian studies. This study suggests that there is increase in prevalence of Barrett's esophagus in Indian community. In our study we have analyzed 75 cases of upper gastroesophageal cardiac biopsies and its various histological patterns in a referral tertiary care hospital. We have also correlated these features with special stain like PAS and alcian blue.Most common age group in the present study was middle and older people, with 69.3% were males and 30.7% were females. Out of 75 cases studied; 35 (46.7%) had Barrett's esophagus, 14 (18.7%) had mild esophagitis, 6 (8.0%) had candidial esophagitis, 5 (6.7%) had acute ulcerative esophagitis, 5 (6.7%) had chronic esophagitis, 5 (6.7%) had viral esophagitis, 1 (1.3%) had infected granulation tissues, 3 (4.0%) had normal findings and 1 (1.3%) had GERD.

KEYWORDS: Gastro-esophageal reflux disease, **BE:** Barrett's oesophagus, **PAS:** Periodic acid schiff stain, **SIM:** Squamous intraepithelial metaplasia.

INTRODUCTION

Reflux esophagitis or gastroesophageal reflux disease (GERD), is one of the most common non-neoplastic disorders of the esophagus. The incidence of Helicobacter pylori infection, gastric carcinoma and peptic ulcers has decreased in the Western countries, gastroesophageal reflux disease has been on the rise. Reflux occurs in middle age and in both sexes. The specific symptoms include heartburn and regurgitation occurring after consumption of fat-rich foods.

Atypical symptoms include angina-like chest pain, un-easiness, regurgitation and protracted hiccups. Which may lead to complications such as erosive esophagitis, strictures, Barrett's esophagus, and malignancy. (1)

As a consequence of the irritation caused by the reflux of acid and bile, adenocarcinoma may develop in these patients, representing the sequence which starts with the development of GERD and progresses to metaplasia (Barrett's esophagus, BE), low grade dysplasia, high-grade dysplasia and adenocarcinoma. Although there has been a decrease in the incidence of oral squamous cell cancers, the rate of esophageal adenocarcinoma has increased rapidly and this has been traced to the advent of obesity epidemic, GERD and Barrett's esophagus. Hence it is important to diagnose Barrett's esophagus primarily. (2)

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Endoscopic biopsies help to understand the distribution upper GI lesions in patients presenting with upper GI symptoms and to follow the endoscopic diagnosis for medical and surgical management. [3]
Both columnar mucinous cells and goblet cells produce mucins that can be differentiated using mucin histochemistry. The columnar cells produce neutral mucins similar to gastric surface epithelial cells and/or acidic mucins, which is typical of intestinal mucosa. Therefore, these cells can stain red (neutral mucins), blue (acidic mucins) or magenta (neutral and acidic mucins) on a combined PAS–alcian blue stain. [4,5]

AIMS
To study and interpret the histopathological findings in patients of gastro-esophageal reflux disease in the upper gastrointestinal endoscopic (cardia) biopsies.

OBJECTIVES
1. To evaluate endoscopic biopsies in GERD cases.
2. To evaluate the spectrum of histopathological changes in GERD cases

MATERIALS & METHODS
This is a three year retrospective & cross sectional study in patients diagnosed with GERD after undergoing upper gastrointestinal endoscopic (cardiac) biopsies in our Hospital and from 1st Feb 2016 to 1st Feb 2019. We have included 75 endoscopic biopsies at the cardia of gastroesophageal junction. Case details with HPE findings and special stain findings were recorded. Various histopathological patterns in reflux disease were studied.

Inclusion criteria:
All the patients reporting to Hospital having symptoms of GERD in whom endoscopy biopsy will be done would be taken for this observational study.

Exclusion criteria:
- Patients having endoscopic diagnosis of adenocarcinoma of esophagus.
- Patients of esophageal varices.
- Patients with derange coagulation profile.

RESULTS
In our study we have analysed 75 cases of upper gastroesophageal cardiac biopsies and its various histological patterns in a referral tertiary care hospital. We have also correlated these features with special stain like PAS and Alcian blue.
In males, the most common diagnosis was Barrett's esophagus (44.2%), followed by mild esophagitis (26.9%) and chronic esophagitis (7.7%). Where as in females, Barrett's esophagus had more prevalence (52.2%), followed by candidal esophagitis (13.0), and viral esophagitis (13.0%).
The most common presenting complaints was epigastric pain i.e. 34 cases (45.3%), 24 cases (32.0%) had reflux, 14 cases (18.7%) had retrosternal pain, 14 (18.7%) had vomiting, 14 (18.7%) had heartburn, 8 (10.7%) had dysphagia and 4 (5.3%) had Hiatal hernia.
Similarly commonest histological findings was inflammatory cells (100%) and other were 65 (86.7%) hyperplastic sq. epithelium, 34 (45.3%) columnar metaplasia, 14 (18.7%) ulceration, with (8.0%) candida, 5 (6.7%) had viral inclusions, 4 (5.3%) had haemorrhage, only one case (1.3%) had dysplasia on histopathological examination.
Out of 75 cases, PAS satin positive cases are 41 which include Barrett’s esophagus 35 cases and candidal esophagitis 06 cases showing 100% positivity.
Similarly, Alcian blue stain showing 100% positivity in all 35 cases of Barrett’s esophagus. Alcian blue stain is positive in goblet cells with intestinal metaplasia suggesting Barrett’s esophagitis.

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Figure 1- Distribution of presenting complaints among the group of cases studied.

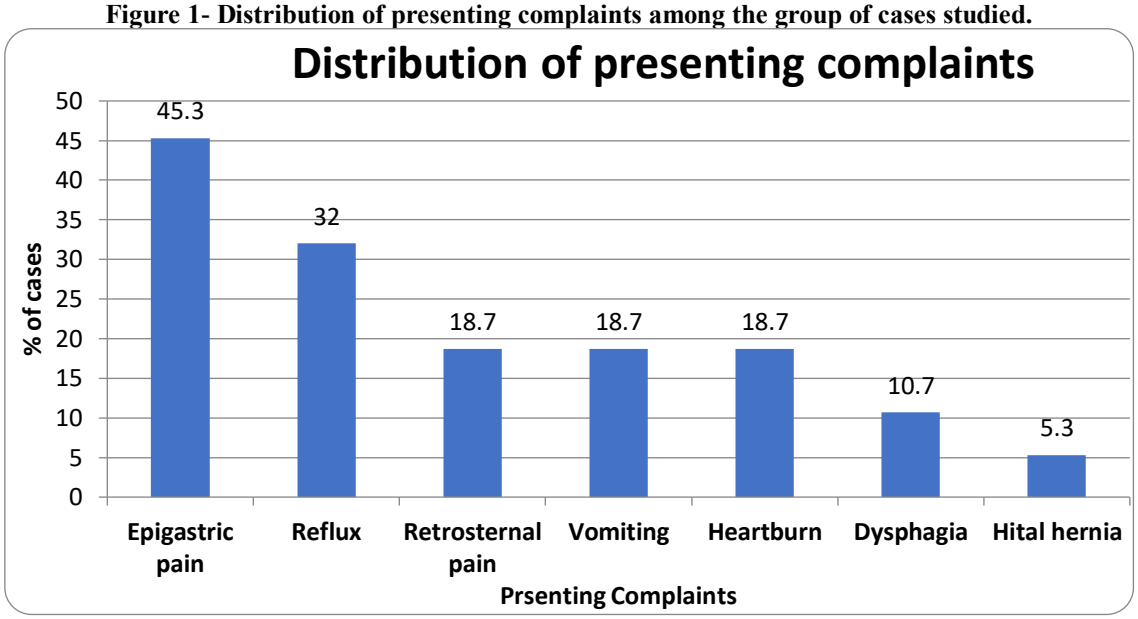

Figure 2 - Distribution of various histopathological features among the group of cases studied.

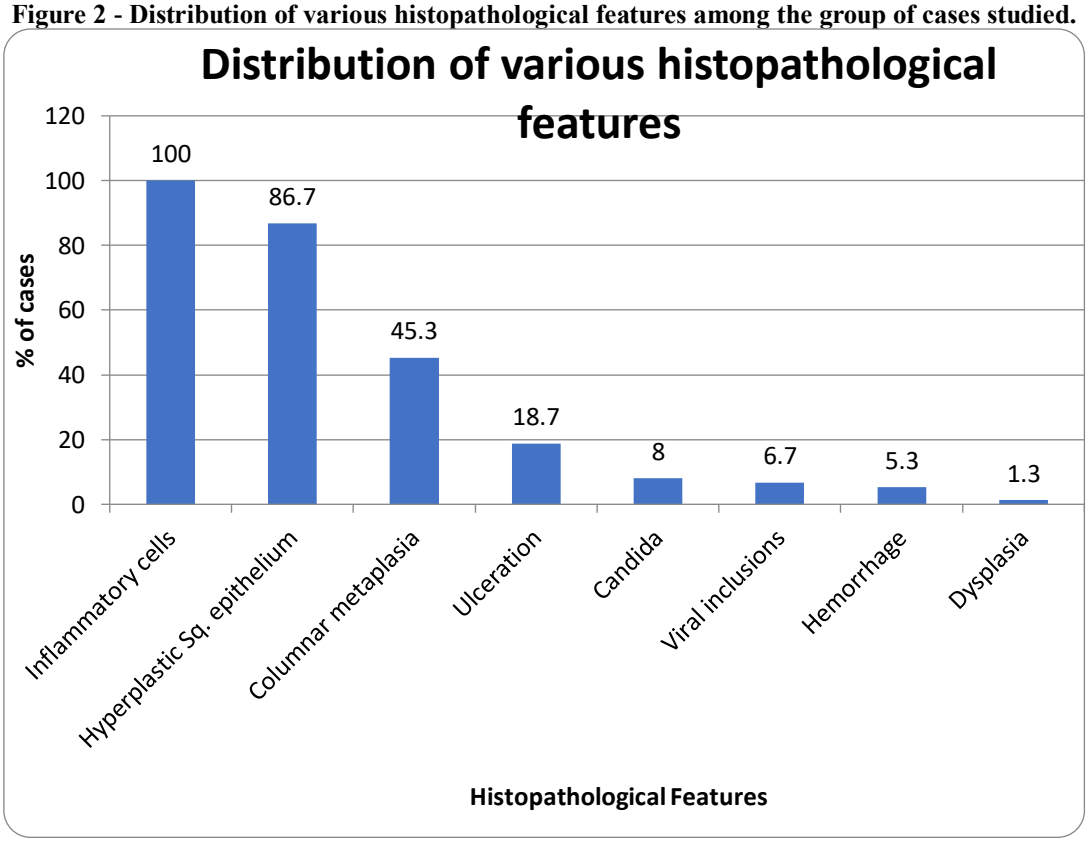

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Figure 3 - Distribution of final diagnosis based on upper gastrointestinal endoscopic (cardiac) biopsies in the patients having GERD symptoms.

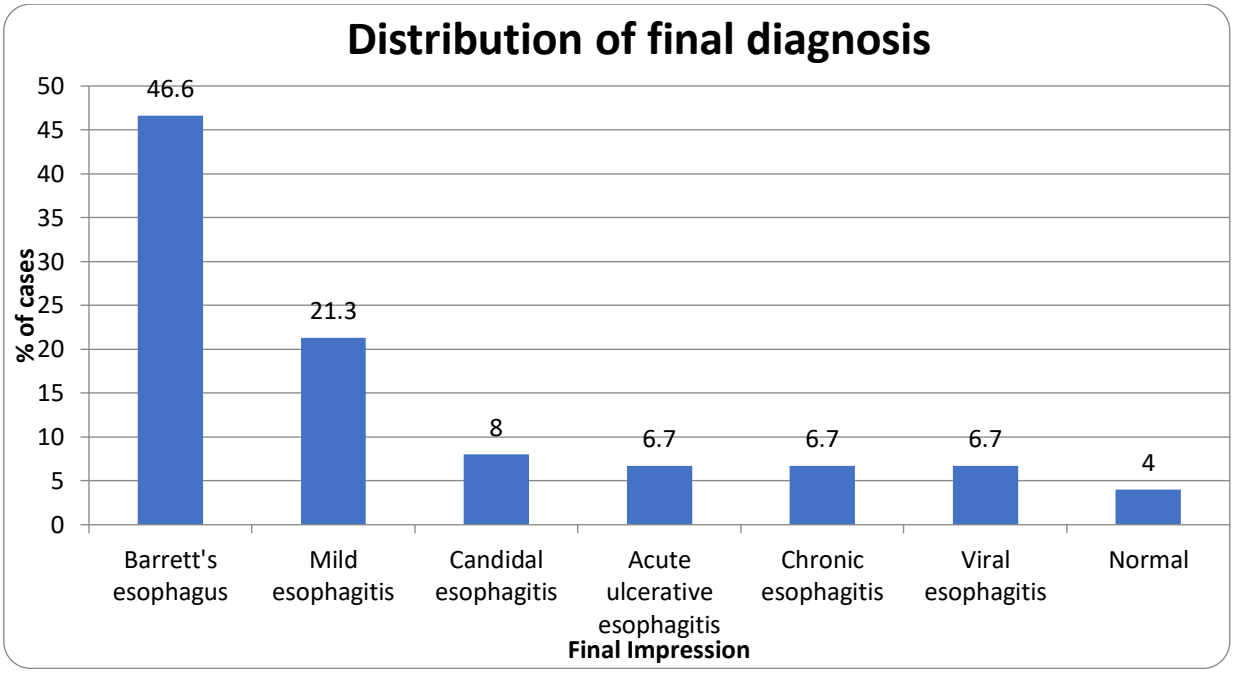

Figure 4 - Distribution of final diagnosis based on upper gastrointestinal endoscopic (cardiac) biopsies according to various age groups in the group of cases studied.

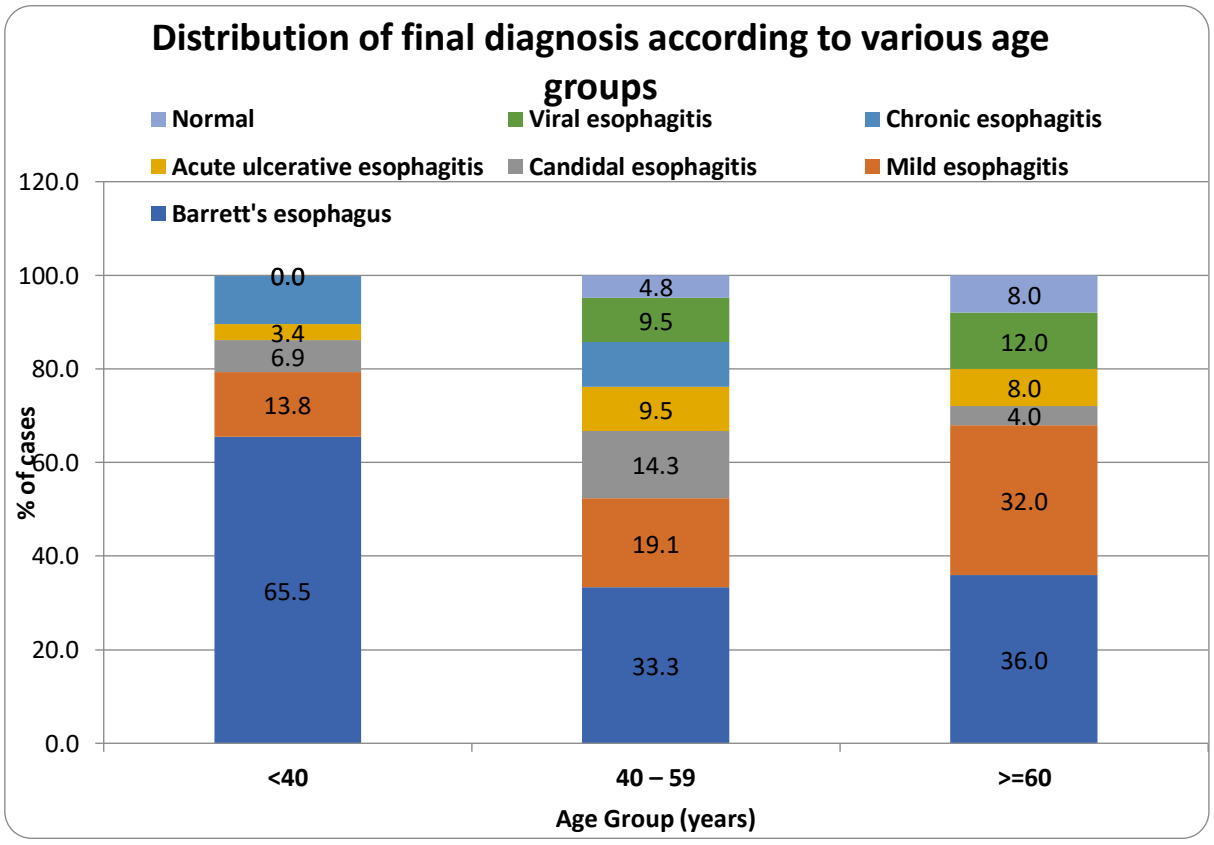

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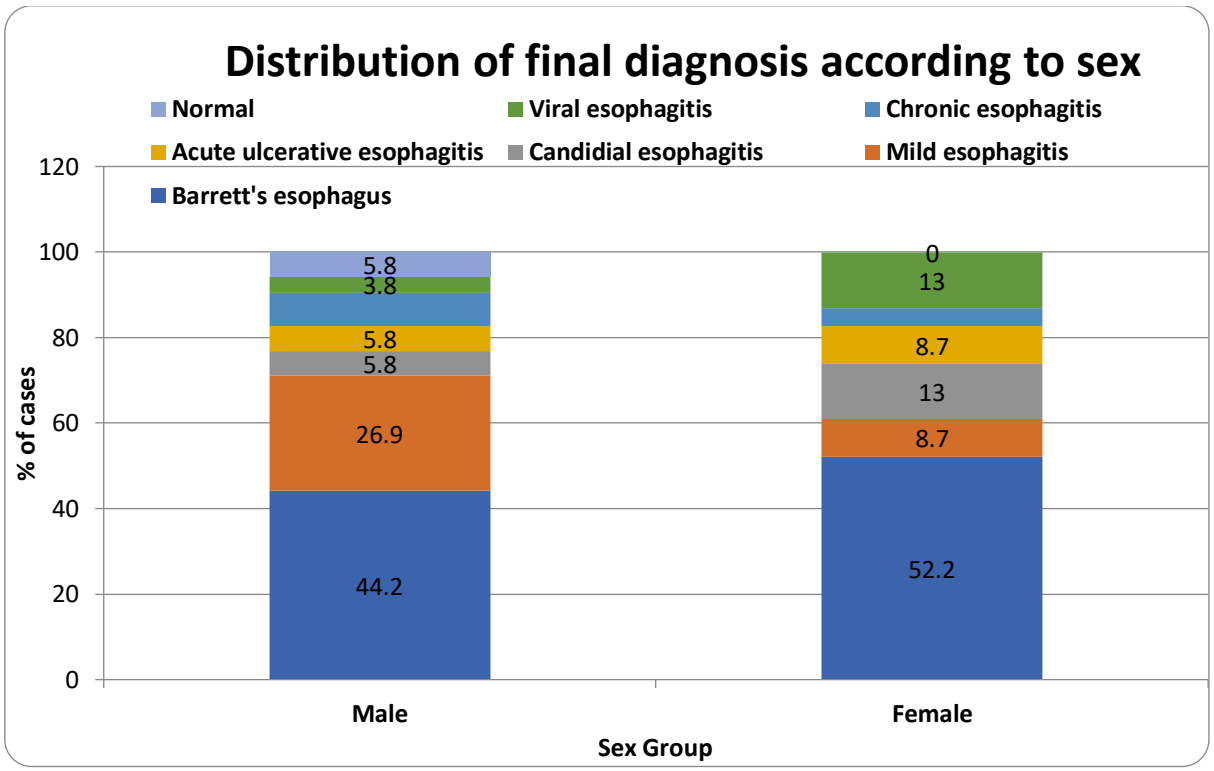
Figure 5 - Distribution of final diagnosis based on upper gastrointestinal endoscopic (cardiac) biopsies according to sex in the group of cases studied.



IMAGES

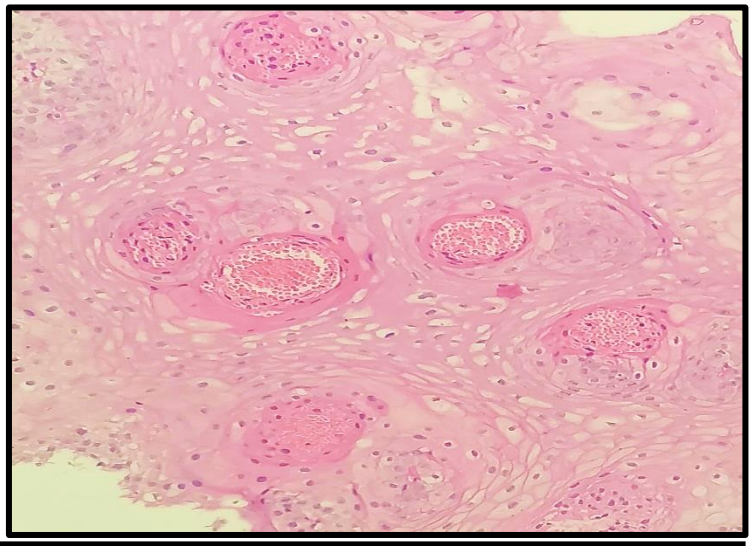


Image no. – 1, High power view of GERD showing congested blood vessels (same case), H & E stain.

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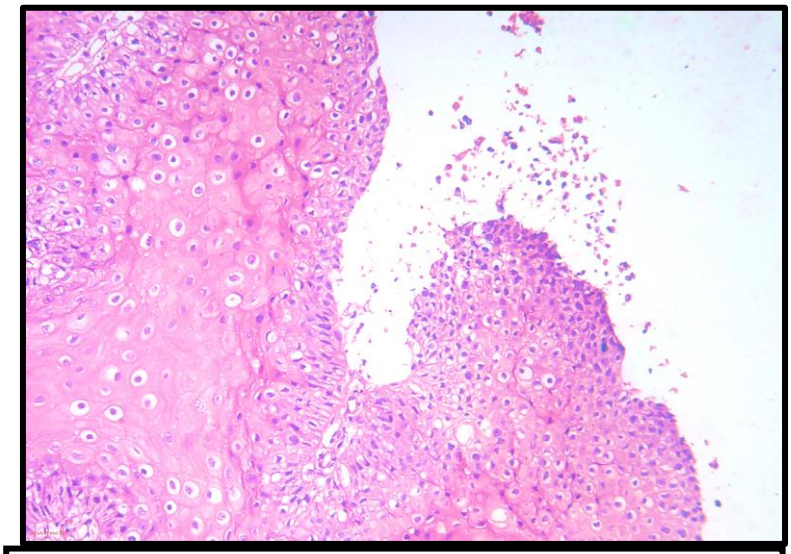

Image no. – 2, Microscopic picture of ulcerative esophagitis, H & E stain, 20X.

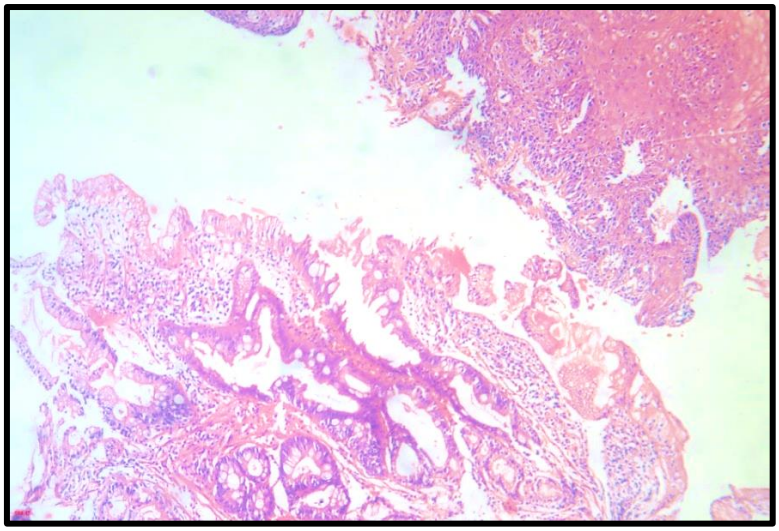

Image no. – 3, Microscopic picture of Barrett's esophagus showing stratified squamous epithelium with columnar metaplasia, H & E stain, 10X.

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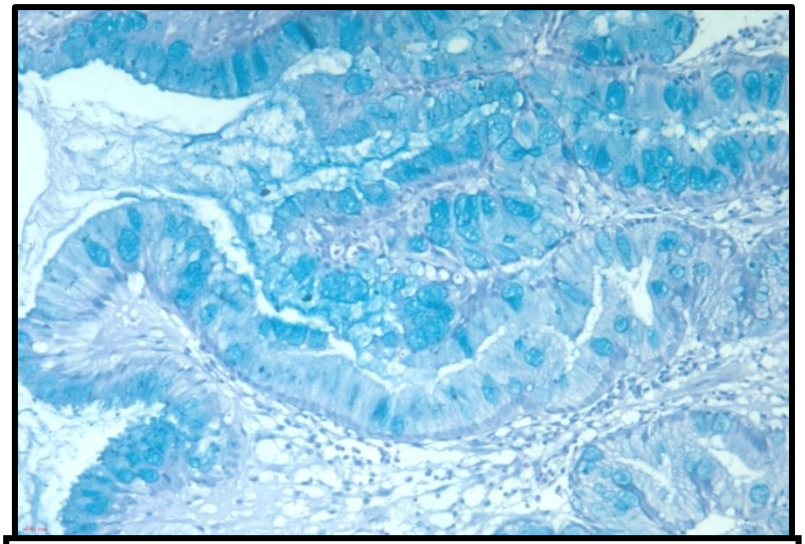

Image no. – 4, Alcian blue stain highlighting goblet cells in intestinal metaplasia, high power view.

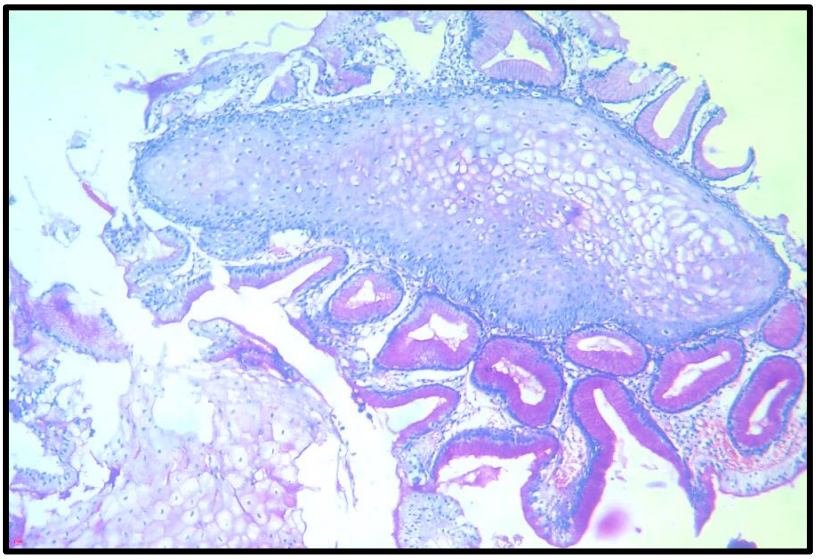

Image no. - 5, PAS stain in Barrett's esophagus, highlighting columnar metaplasia at GE junction, 20X.

DISCUSSION

Out of 75 cases, 35 (46.6%) had Barrett's esophagus. The higher prevalence of Barrett's esophagus in this study may be because of the institute, were the study in conducted is a referral centre. So advanced cases would be coming to the institute. Punia et al studied 55 patients with symptoms of GERD. In their study, 13 patients were diagnosed as having BE (6 detected as having squamous intraepithelial metaplasia (SIM) and 7 as gastric metaplasia) with a prevalence rate of 23.4%. [6]

Wani IR et al studied 378 patients with GERD; there was an endoscopic suspicion of CLE in 56 patients. Therefore, it was observed a prevalence rate of 14.81% of endoscopic BE in patients with GERD. [7]

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Out of 75 cases 15 (20.0%) had mild esophagitis in the present study, which is comparable with incidence of esophagitis 11.8% in Javali S et al study. [3]

Out of 75 cases, 34 (45.3%) had epigastric pain, 24 (32.0%) had reflux, 14 (18.7%) had retrosternal pain, 14 (18.7%) had vomiting, 14 (18.7%) had heartburn, 8 (10.7%) had dysphagia and 4 (5.3%) had Hiatal hernia. In the study of Pravin Kumar , 2011 et al, 4039 eligible subjects, 653 (16.2%) had GERD; 3.6% had heartburn on daily basis and 5.9% on a weekly basis. The corresponding prevalence's for regurgitation were 3.3% and 5.0%, respectively. Thus, epigastric tenderness was the most common sign among the patients clinically. [8]

Out of 75 cases, all cases (100%) had inflammatory cells, 65 (86.7%) had hyperplastic sq. epithelium, 34 (45.3%) had columnar metaplasia, 14 (18.7%) had ulceration, 6 (8.0%) had candida, 5 (6.7%) had viral inclusions, 4 (5.3%) had haemorrhage, 1 (1.3%) had dysplasia on histopathological examination.

Two studies reported the prevalence of unspecified dysplasia in histologic BE; and they were 1.3% and 3.3%, respectively. [9,10]

CONCLUSION

This study illustrates the spectrum of gastroesophageal reflux disease (GERD) and its associated complications. Our findings indicate that GERD is prevalent among middle-aged and older individuals, with a slight male predominance. The most commonly reported symptom is epigastric pain. Barrett's esophagus was the most frequently observed condition, followed by esophagitis and ulcerative esophagitis, all stemming from reflux disease.

We utilized PAS stain and Alcian blue stain to confirm intestinal metaplasia and the presence of goblet cells within the metaplasia. In conclusion, understanding the various histopathological changes associated with GERD is crucial for early detection of metaplastic and dysplastic alterations.

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