HISTOPATHOLOGICAL SPECTRUM OF UPPER GASTRO-INTESTINAL MALIGNANCIES IN ENDOSCOPIC BIOPSY AND HELICOBACTER PYLORI STATUS IN GASTRIC MALIGNANCY

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ABSTRACT

BACKGROUND

Upper gastrointestinal tract (GIT) is one of the most common sites for neoplasms, especially malignant tumours. Endoscopic biopsy examination followed by histopathological assessment is a convenient procedure and current gold standard for accurate objective assessment of patients with symptoms of upper GIT. The indications for upper GIT endoscopic biopsy include- evaluation of dyspepsia, odynophagia, gastroesophageal reflux disease (GERD), peptic ulcer disease and its complications, abdominal pain, gastric and oesophageal growth. Efficient endoscopic findings also help the pathologist to reach a correct diagnosis. Helicobacter pylori (H. pylori) is identified as an important aetiologic factor to develop peptic ulcer disease, gastric MALT lymphoma, pre-malignant and malignant gastric lesions. The diagnosis of H. pylori is done by rapid urease test in the biopsy material and special staining by Giemsa in the histopathology sections. Therefore, the purpose of this study is to determine the occurrence of upper GI malignancies with identification of different morphological spectrum and find out the correlation between H. pylori infection and gastric malignancy.

MATERIALS AND METHODS

Selected subjects of upper GI symptoms underwent endoscopy with flexible fibre optic endoscope and the endoscopic findings were noted. All the biopsy samples were routinely processed and stained with haematoxylin and eosin (H and E) for light microscopic examination. Rapid urease test in biopsy material and Giemsa stain in the tissue sections were done to detect H.pylori in gastric tissue.

RESULTS

Out of 109 upper GI endoscopic biopsies 45 malignancies were there which involved 12 from oesophagus, 31 from stomach and two from duodenum. Squamous cell carcinoma in oesophagus and intestinal type of adenocarcinoma in stomach were the commonest findings. H. Pylori were detected in two (6.45%) out of 31cases of gastric carcinomas.

CONCLUSION

The upper GI diagnostic endoscopy followed by biopsy is a useful tool to diagnose upper GI malignancy. Although a small number of patients affected by H. pylori gastritis will eventually develop malignancies, early diagnosis of H. pylori gastritis followed by eradication of the organism with appropriate treatment should be done to prevent the progression to metaplasia, dysplasia and carcinoma.

KEYWORDS

Endoscopic biopsy, upper gastrointestinal tract, malignancy, Helicobacter pylori.

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BACKGROUND

Until about the time of World War II knowledge of Gastrointestinal Pathology was largely based on autopsy studies which were often erroneous because of tissue autolysis.[1] New techniques of endoscopic biopsy followed and added to the abundance of tissue available to pathologists for the diagnosis and the study of the pathogenesis and pathology of gastrointestinal tract (G.I.T.) diseases. Endoscopic biopsy examination followed by histopathological (H/P) assessment is a convenient procedure and current gold standard for accurate objective assessment of patients with symptoms of upper G.I.T. The indications for upper GIT endoscopic biopsy includes – evaluation of dyspepsia, odynophagia, gastroesophageal reflux disease(GERD), Barrett's oesophagus, dysplasia, peptic ulcer disease and its complications, gastric and oesophageal carcinoma. Upper gastrointestinal tract is one of the most common sites for neoplasms, especially malignant tumors. According to the National Cancer Registry, oesophageal and gastric cancers are the most common cancers found in men, while oesophageal cancer ranks third among women after the carcinoma of breast and

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cervix.[2] With the increasing incidence of mortality related to upper G.I. malignancies the role of endoscopic biopsy in screening and confirming diagnosis is unquestionable. Endoscopic practice is improving day by day with the advancements of modern techniques. It is also established that endoscopic findings always help the pathologists to achieve the correct diagnosis as pathologists prefer clinicians to stay in clinical mode and give accurate clinical details and, particularly, endoscopic details.[3]

The most important development in the field is the identification of Helicobacter pylori (H. pylori) as an important etiologic factor in gastric carcinoma.[4,5,6] This inflammation can progress to peptic ulcer disease, gastric MALT lymphoma, and pre-malignant gastric lesions. Although only a small proportion of patients with H. pylori will eventually develop malignant disease, the widespread high prevalence of this bacterium explains that gastric cancer remains the fourth most common cancer and second leading cause of cancer related death worldwide.[7,8] Rapid urease test, a rapid diagnostic test for diagnosis of Helicobacter pylori, is an invasive test in that it requires sampling of the gastric mucosa. The test provides indirect evidence of the infection by identifying the presence of a non-mammalian enzyme, urease, in or on the gastric mucosa. Direct identification can be done by special staining on histopathologic sections.

Aims and Objectives

Therefore the purpose of this study was to determine the occurrence of upper GI malignancies with identification of different morphological spectrum and find out the H. pylori status in gastric malignancy.

MATERIALS AND METHODS

This study is a retrospective descriptive study conducted in Department of Pathology and Gastroenterology of a tertiary care hospital in Durgapur over a period of 18 months. Selected subjects of upper GI symptoms like dyspepsia, odynophagia, GERD, peptic ulcer disease, heartburn, pain epigastrium, nausea, vomiting, etc., were underwent endoscopy with flexible fiber-optic endoscope and the endoscopic findings were noted. All the mucosal biopsies were put in 10% neutral buffered formalin properly labeled with the site of the biopsy. Additional biopsies from gastric tissue were taken for rapid urease test. Brief clinical history and endoscopic findings were taken in all cases. All the samples were routinely processed and stained with hematoxylin and eosin (H and E) for light microscopic examination. For H. pylori status in the gastric tissue Giemsa stain was done. Cases were considered to be H. pylori infected when either RUT or histology was positive.

RESULTS

In the present study; endoscopic biopsies were studied on patients of age ranging from 5 years male to 83 years male. Total 109 upper GI endoscopic biopsies were done among which 45 malignancies were there. 12 cases of malignancy from oesophagus, 31 from gastric and two from duodenum were found (Table-1). Age of malignancy ranged from 31 years to 83 years with occurrence of maximum cases in 7th decade. Overall malignancies show male preponderance except in oesophageal cases where eight cases among 12 cases of malignancies were found in female population. Most of the carcinomas of oesophagus were squamous cell carcinomas (SCC) of which four were well differentiated, six were moderately differentiated and one was poorly differentiated. All the gastric and one case of duodenal malignancies were adenocarcinoma. Among the gastric carcinomas intestinal variety was most common (45.16%), followed by diffuse type (19.35%) and signet ring type (19.35%). 4 cases of mucinous carcinoma (12.90%) and only one case of tubular variant of adenocarcinoma were found (Table-2). Most of the gastric carcinomas were found at antrum (35.48%) followed by pylorus (25.81%). We found only one case of malignant gastrointestinal stromal tumor (GIST) in duodenum. In endoscopy most of the oesophageal SCC cases presented with exophytic mass followed by stricture with irregular mucosa at the lower end of the oesophagus. One case of oesophageal adenocarcinoma presented nodular mass with obstruction at lower end of oesophagus. Gastric adenocarcinoma in endoscopy mostly presented with exophytic mass followed by ulcerative growth. Nodularity with increased vasculature and thickened mucosa with loss of rugae were also encountered in some cases. Duodenal adenocarcinoma presented as ulcerative growth whereas malignant GIST showed nodularity in endoscopy. H. Pylori were detected in two (6.45%) out of 31cases of gastric carcinomas, six (30%) out of 20 cases of chronic gastritis and one case of low grade dysplasia (Table-3).

Site	No. of Malignant Cases (n-45)	Endoscopic Findings	Histopathologic Findings
Oesophagus	12(26.67%)	Exophytic Growth (8)	Squamous cell carcinoma
		Stricture with irregular mucosa (3)	Squamous cell carcinoma
		Nodular mass with obstruction of lower end (1)	Adenocarcinoma
Stomach	31(68.89%)	Exophytic mass (12)	Adenocarcinoma
		Ulcerative growth (10)	
		Nodularity with abnormal vasculature (05)	
		Thickened mucosa with loss of rugae (04)	
Duodenum	2(4.44%)	Ulcerative growth (1)	Adenocarcinoma
		Nodularity (1)	Malignant gastrointestinal stromal tumor

Table 1. Distribution of Malignant Cases According to Site and Correlation with Endoscopic Findings

Site of Gastric Biopsy	Histomorphological Type	No. of Cases (31)
Gastro oesophageal junction (16.13%)	Intestinal	03
	Diffuse	02
Fundus (16.13%)	Intestinal	02
	Mucinous	02
	Signet ring	01
Lesser curvature (6.45%)	Intestinal	01
	Diffuse	01
Antrum (35.48%)	Intestinal	05
	Mucinous	02
	Diffuse	02
	Tubular	01
	Signet ring	01
Pylorus (25.81%)	Intestinal	03
	Diffuse	01
	Signet ring	04

Table 2. Histomorphological Variants of Gastric Adenocarcinomas with Site Distribution

Lesions	No. of Cases	No. of H. Pylori Positive Cases	No. of H. Pylori Negative Cases
Chronic gastritis	20	06 (30%)	14
Gastric polyp	03	00	03
Dysplasia	02	01	01
Gastric carcinoma	31	02 (6.45%)	29

Table 3. Gastric Lesions Showing H. pylori Positivity

DISCUSSION

The common site for upper GI endoscopic biopsy is from stomach followed by oesophagus and duodenum.

Oesophageal Malignancies

Among the 12 cases of oesophageal malignancies 8 cases (66.67%) occurred in female population. Reviewed literature also showed rising pattern of esophageal malignancy in female.[9] Highest numbers of cases are seen in 7th decades. Population based data suggest that esophageal cancer incidence peaks in the sixth decade in most parts of the world.[10] Another feature of this study showed that occurrence of carcinoma at younger age in females which correlates with other study.[10] The possible explanation would be habit of cigarette smoking, alcoholism and other dietary habits like chewing of betel nut in pan among Indian females and also higher prevalence of iron deficiency anemia in female. Squamous cell carcinoma arising from lower part of oesophagus is the most common (91.67%) finding in our study which correlates with the study done by Inian Samarasam[11] Oesophageal malignancies were easily diagnosed by endoscopy as most of the cases presented as exophytic growth or stricture with irregular narrowing of lower end.

Gastric Malignancies

Total 31 cases were malignant in our study with high male: female ratio (almost 5: 1) which is strikingly high in comparison to other study.[12] Probably the habit of drinking alcohol and smoking simultaneously is there in male population. Intestinal variety according to WHO classification was the most common finding here. Our study correlates with the study done by Plummer et al[13] which showed adenocarcinoma as a common gastric malignancy and antrum as the common location. Most of the patients presented with gastric carcinoma clinically were suspicious for malignancy as most of them presented with exophytic or ulcerative growth. Other two features like nodularity with change in the microvasculature and thickened mucosa with loss of rugal folds detected by magnified endoscopy also raised the suspicion of gastric malignancy.[14] We found only 2 cases (6.45%) among 31 cases of gastric malignancy to be positive for H. pylori depending upon the rapid urease test (RUT) results. The rapid urease test, first described by Mc Nulty and Wise in 1985, has gained wide acceptance in the detection of H. pylori in mucosal biopsy samples.[15] RUT well correlated with the Giemsa stained biopsy slide in all the cases of chronic active gastritis. But due to loss of normal architecture and presence of tumor diathesis in adenocarcinoma specimen we failed to demonstrate H. pylori bacilli in routine and Giemsa stained histopathology sections. In these cases we had to rely on the RUT result. Reviewed literature reveals that there is a significant risk of progression to cancer in cases of H. pylori gastritis, when they are associated with atrophy and metaplasia.[16]

Duodenal malignancies

We found one case of adenocarcinoma and another case of malignant GIST in second part of duodenum. Malignant tumors are rare in duodenum of which Only 3%–5% of GISTs are found in the duodenum.[17] Factors that correlate with malignancy in GIST are tumour size > 5 cm, mitotic count > 5 per 50 high power field (HPF), dense cellularity, and mucosal invasion.[18] In our case mitotic count was 15/50

HPF along with high cellularity and nuclear atypia which were the indicators for malignancy irrespective of other findings. Closest differential diagnosis of this case was leiomyosarcoma in endoscopic small biopsy later in larger excision biopsy it was found to be GIST.

CONCLUSION

Upper gastrointestinal tract is one of the most common sites for neoplasms, especially malignant tumors. The upper GI diagnostic endoscopy followed by biopsy is a useful tool to diagnose upper GI malignancy. It will also help in early detection and treatment. As stomach and oesophagus are the most common areas to develop malignancy, biopsy should be done in cases of abnormal endoscopic findings. Although a small number of patients affected by H. pylori gastritis will eventually develop malignancies, early diagnosis of H. pylori gastritis followed by eradication of the organism with appropriate treatment should be done to prevent the progression to metaplasia, dysplasia and carcinoma.

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