



Original Research Article

Clinico-pathological correlation of gastric cancer in a tertiary referral centre

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ABSTRACT

Introduction: Survival in advanced gastric adenocarcinoma is low, due to which it becomes important to detect it in early stages. The aim of this study is to observe the demographic and clinic-pathological profile of gastric cancer in a tertiary referral centre in Mumbai, India.

Materials and Methods: We retrospectively studied 81 cases of adenocarcinoma of stomach in a tertiary care hospital. Their clinical history and relevant investigations were studied.

Result: The median age of the patients was 60 years. All patients had complaint of abdominal pain. Antrum (46.9%) was the most common location. Intestinal type (59.3 %) of adenocarcinoma was the most common sub-type.

Conclusion: Study showed moderately differentiated carcinoma to be the most frequent malignancy. Majority of cases had history of tobacco consumption, which indicates its role in causation of stomach cancer. Due to non-specific symptoms, and detection at advanced stage, screening of asymptomatic people in a high risk area may be useful in early detection

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1. Introduction

Cancer is one of the leading causes of morbidity and mortality worldwide, with approximately 14 million new cases and 8 million cancer related deaths in 2012.¹ Gastric cancer is the fifth most commonly occurring cancer after lung, breast and colorectal cancer. In 2012, of the 952,000 estimated cases, 677,000 cases were from developing countries.

Majority of the patients present with gastric cancer in advanced stage metastasizing to lymph nodes and other organs causing poor prognosis. In Asian countries the intestinal subtype of adenocarcinoma is the commonest histopathological variety. Although surgery is an important part of treatment, long term survival is seen in minority.

This study aims to observe the demographic and clinic-pathological profile of gastric cancer in a tertiary referral centre in Mumbai, India.

2. Materials and Methods

This was a retrospective study of 81 cases of adenocarcinoma of stomach diagnosed in the Department of Pathology in a tertiary care referral hospital and teaching institute from January 2006 to December 2015. Among these cases, 42 specimens and 39 biopsies were studied. The patients were diagnosed on clinical, radiological, endoscopic examination with confirmation by histopathological examination of either endoscopic biopsy or the resected specimen.

Clinical parameters such as age, sex, religion, blood group, dietary habits, addiction, endoscopic findings, clinical features, type of resected specimen, site of lesion, gross findings, histopathological types, associated findings in surrounding mucosa and TNM staging were noted. The resected gastrectomy specimens were examined grossly and tumour location, tumour dimensions, extent of tumour invasion, metastasis to lymph nodes, number of lymph nodes involved, abnormality in surrounding mucosa were recorded.

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10% formalin fixed endoscopic biopsy specimens were processed and cut into 4-5 mm thickness and subjected to hematoxylin and eosin (H and E) staining, special stains like periodic acid Schiff (PAS) and alcian blue (AB).

3. Result

In the period Jan 2006 to Dec 2015, a total of 81 patients presented with gastric cancer. Median age of study population was 60 years. Largest cluster of cases was concentrated in 60-69 years (49%) followed by 50-59 years (27%). Amongst the cases, 50 (62%) were male, 31 (38%) were female, with a sex ratio (male:female) of 1.61:1.

In the study, a considerable population (74.1%) consumed tobacco. The tobacco consumption pattern was found to be more in males (78.0%) as compared with females (67.7%). However, when it came to alcohol consumption, there was significant difference between male (50.0%) and female (3.2%) history. About 75.3% of the population had history of spicy food, while 56.8% had history of salty food. However, consumers of smoked food was comparatively lower (25.9%). Whereas, only 34.6% of the patients reported consumption of fresh foods. The most common blood group in our study was A (49.4%), followed by O (28.4%).

Abdominal pain was a complaint of all the patients (100%), followed by weight loss (85.2%), nausea (81.5%), anorexia (71.6%), anaemia (56.8%), early satiety (53.1%), mass (38.3%), dysphagia (17.3%) and malena (3.7%). Antrum (46.9%) was the most common site of gastric cancer followed by pylorus (18.5%).

On endoscopy, 32.5% of the cases had ulcerative lesion, followed by diffuse thickening at the distal part seen in 17.5% cases. Histopathologically, according to Lauren's classification, intestinal type of adenocarcinoma was the most common (59.3%), followed by diffuse type (34.6%) and mixed type (6.2%). Moderately differentiated adenocarcinoma (46.9%) was found to be the most common type followed by poorly differentiated adenocarcinoma (19.8%), signet ring cell adenocarcinoma (16.0%), mucin secreting adenocarcinoma (8.6%), well differentiated adenocarcinoma (7.4%), adenosquamous carcinoma (1.2%). Under TNM staging, 45.2% cases had stage I involvement. 47.6% of the cases had tumour involvement reaching up to serosa i.e. stage II. Very few cases had shown spread of the tumour to the adjacent structure i.e. stage III. Surrounding mucosa showed changes of chronic gastritis in 31.0% of cases and intestinal metaplasia (21.4%) and follicular gastritis (16.7%). However, only 7.1% of cases showed features of atrophic gastritis.

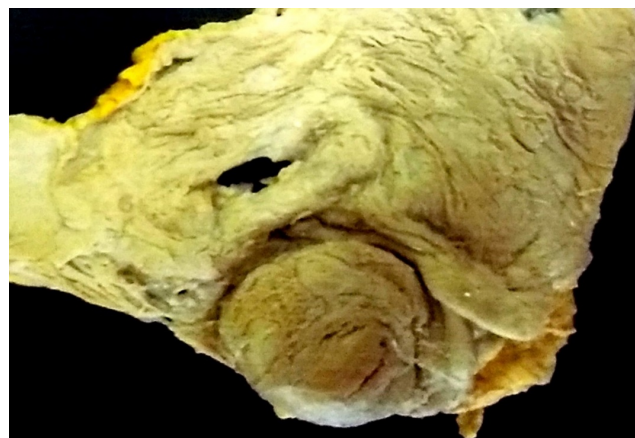


Fig. 1: Partial gastrectomy specimen showing polypoidal growth with loss of normal rugosity



Fig. 2: Carcinoma of stomach showing ulcerative growth with irregular margins and necrotic base at lesser curvature

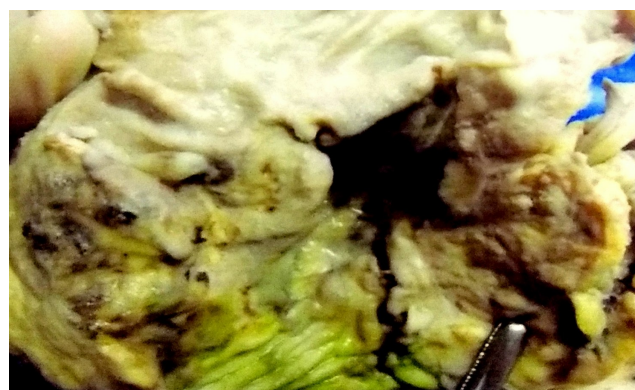


Fig. 3: Carcinoma of stomach showing ulceroproliferative growth at pylorus



Fig. 4: Carcinoma of stomach showing Linitis Plastica variant – Diffuse thickening of stomach wall with no any growth or ulceration

Table 1: Age wise distribution

Age Band	Cases	%
20-29	2	2.5%
30-39	3	3.7%
40-49	8	9.9%
50-59	22	27.2%
60-69	40	49.4%
70-79	5	6.2%
80-89	1	1.2%
Total	81	100.0%

Table 2: Clinical features

Signs and Symptoms	Cases	%
Pain in Abdomen	81	100.0%
Weight Loss	69	85.2%
Nausea/Vomiting	66	81.5%
Anorexia	58	71.6%
Anaemia	46	56.8%
Early Satiety	43	53.1%
Mass	31	38.3%
Dysphagia	14	17.3%
Malena	3	3.7%

Table 3: Site of lesion

Site of Lesion	Cases	%
Antrum	38	46.9%
Fundus	4	4.9%
Cardia	5	6.2%
Greater Curvature	6	7.4%
Lesser Curvature	13	16.0%
Pylorus	15	18.5%
Total	81	100.0%

Table 4: Histopathological types

Types	Total	%
Intestinal	48	59.3%
Diffuse	28	34.6%
Mixed	5	6.2%
Total	81	100.0%

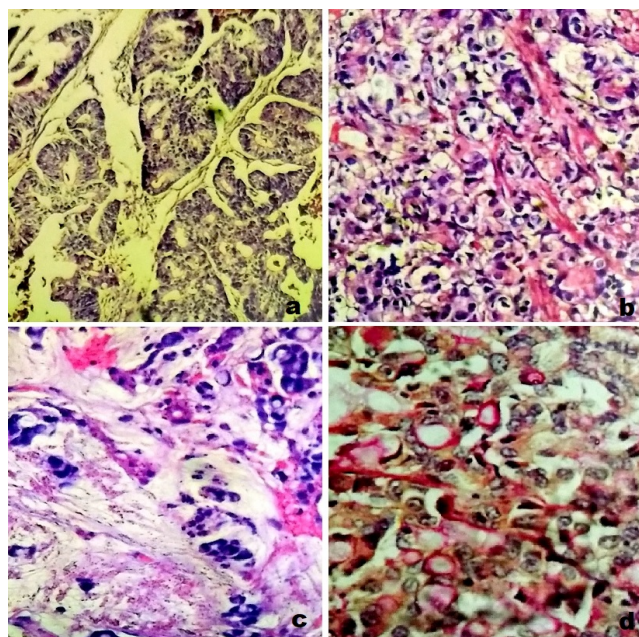


Fig. 5: (a): 10X view - Well differentiated adenocarcinoma of stomach showing well-formed glandular pattern (intestinal type) (b): 400 X view – Mucin secreting adenocarcinoma of stomach showing mucin pushing the nucleus to periphery forming signet ring cells with % of signet ring cells (c): 400 X view - Signet ring cell carcinoma of stomach showing abundant mucin pushing the nucleus to periphery with clear cytoplasm with % of signet ring cells (d): 400X view – Mucin secreting adenocarcinoma of stomach with mucicarmine stain positivity

4. Discussion

Gastric cancer is second most common cancer in male and fifth most common amongst females in East and Central Asia. The incidence of gastric cancer is twice as much in men as in women. Similarly, in our study, the male to female ratio of gastric cancer was 1.61 :1. This was consistent with study conducted by Halder et al.² Males have greater exposure to one or more carcinogen and are therefore more susceptible to these factor than women.³ Further, it is postulated that hormone oestrogen has protective role for gastric carcinoma in females.⁴

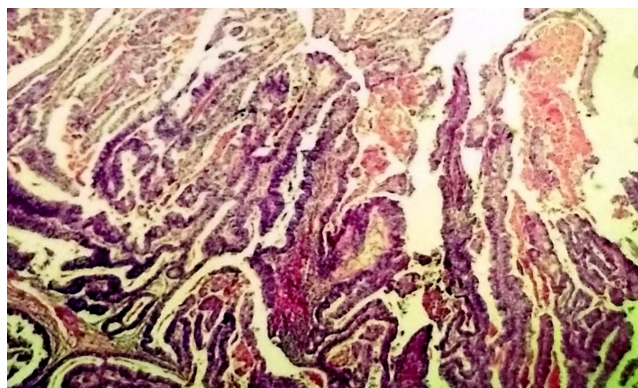


Fig. 6: 10X view of adenocarcinoma of stomach showing papillary growth pattern. Papillae are lined by tall columnar cells with central fibrovascular core

It is observed that the incidence of gastric cancer increased with increase in age, peaking at 6th and 5th decade, and then declined in higher age groups.

In our study, the most common blood group among the cases found was A (49.4%), followed by O (28.4%). Wang et al,⁵ in their case-control study have found significant relationship between ABO blood groups and gastric cancer, with blood group A having significantly higher risk than that in non-A groups. He concluded that there is an inherited element of susceptibility to cancer of stomach in blood group A that may be partially attributed to an increased risk of *H. pylori* infection. Jose et al considers that this blood group predisposition is probably related to the nature of mucopolysaccharide in gastric secretion and differential susceptibility to damage by environmental carcinogens.

In our study more than half (56.8 %) cases consumed salty food. A high intake of salty food and potentially smoked, cured and pickled foods is thought to be a risk factor. Saghier A et al⁶ observed collective evidence from epidemiologic and experimental studies over the past several decades strongly suggests that high intake of salt/salty food is associated with an increased risk of gastric cancer. The acute effects of concentrated salt solutions lead to mucosal damage and its repair is associated with inflammatory changes in human stomach and it also creates condition which enhances *H.pylori* colonization. Dietary nitrates are found naturally or added during preservation in various foods. Nitrates which are present in fertilizer, soil and water also contributes to dietary nitrates. These nitrates are converted into N-nitroso compounds by gastric acid which are carcinogenic causing increased risk of gastric cancer.

In our study 74.1% of cases had a history of tobacco consumption. Qurieshi et al⁷ in their study found that tobacco smoking is an independent risk factor for stomach cancer. Nicotine increases the proliferation and migration of gastric cancer cell by releasing prostaglandins, VEGF

and stimulates angiogenesis leading to increase in mediators of cell proliferation, angiogenesis and metastasis and a decrease in apoptosis. Other mechanisms include induction of development of precursor gastric lesions such as gastritis, ulceration and intestinal metaplasia. Smokers tend to have high incidence of *H.pylori* infection and gastroduodenal infection than non-smokers. However, Rao et al⁸ did not find any relation between tobacco use and risk of gastric cancer.

Clinical profile showed that all the patients presented with history of pain in abdomen followed by weight loss (85.2 %). In some studies, abdominal mass in the main presenting complaint in gastric cancer. However, in our study 38.3 % cases presented with mass in abdomen, which was consistent with finding made by Chattopadhyay et al⁹ that pain in abdomen was more common than abdominal mass in gastric cancer.

In our study, antrum (46.9%) was the most commonly affected site, followed by pylorus (18.5%), lesser curvature (16.0%) and cardia-fundus (11.1%). This is also supported by report in Indian subcontinent by Halder et al. Chanda et al¹⁰ also observed pyloric antrum as the most common site (65.3%) for gastric carcinomas as pyloric antrum provide favourable environment for *H.pylori* growth.

In the present study, among 42 resected specimens, ulcerative growth (46.3 %) was the most common finding on gross examination as well as on endoscopy.

In our study, intestinal adenocarcinoma (59.3%) was most common type, followed by diffuse type (34.6 %). Remaining 6.2 % were of mixed type.

We observed that 46.9 % cases were of moderately differentiated adenocarcinoma, 19.8 % were poorly differentiated, 7.4 % were well differentiated adenocarcinoma of stomach. These findings were consistent with Halder et al where they found 48.6 % and 52.6% of moderately differentiated adenocarcinoma cases respectively.

On TNM staging of gastric cancer, it was observed that 47.6 % cases showed tumour involvement reaching up to serosa, that is Stage II and 38.1% cases showed tumour invading the muscularis propria, that is Stage IB. Very few cases (7.1%) showed spread of the tumour to adjacent structures that is Stage III.

In our study, surrounding mucosa showed presence of chronic gastritis (31.0%), intestinal metaplasia (21.4%), follicular gastritis (16.7%) and atrophic gastritis (7.1%). These findings might be the precursor lesions for gastric cancer. Infection with *H. pylori* is a major cause of non-atrophic chronic gastritis and is associated with gastric ulcer disease and distal gastric cancer. Intestinal metaplasia have a >10 fold increased risk of developing gastric cancer, which may be even higher in patients with *H. pylori* infection.

These results re-emphasize that gastric cancer symptoms are non-specific and need an early screening examination.

5. Conclusion

Present study showed moderately differentiated carcinoma to be the most frequent malignancy. Most patients belonged to 60-69 year age group and had a male predominance. Blood group A was most prevalent and predominant presenting symptom was abdominal pain. More than half of the cases consumed salty food. Majority of cases had history of tobacco consumption, which clearly indicates the role of tobacco in causation of stomach cancer. Weak relation was seen in alcohol consumption. Majority of the cases had ulcerative growth reaching up to serosa, belonged to stage II according to TNM classification. Chronic gastritis may be the precursor lesion for gastric cancer.

Screening of asymptomatic people in a high risk area may be useful in early detection of disease. Efforts to detect cancer early in developing countries would go a long way in reducing the disease burden and improving the outcome.

6. Source of funding

None.

7. Conflict of interest

None.

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