Chattagram Maa-O-Shishu Hospital Medical College Journal
Volume 25, Issue 1, January 2026
https://doi.org/10.3329/cmoshmcj.v25i1.89832

Original Article

Clinico-Histopathological Analysis of Gastric Adenocarcinoma Cases in a Tertiary Hospital in Bangladesh

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Date of Submission : 15.11.2025
Date of Acceptance : 27.12.2025

www.banglajol.info/index.php/CMOSHMCJ

Abstract

Background: *Gastric adenocarcinoma is the fifth most common cause of cancer worldwide and sixth most common cancer in Bangladesh. Histologic classification may predict tumor biology, clinical behavior, and outcome. This study aimed to determine the clinical and histological profile of patients with gastric adenocarcinoma in a tertiary hospital in Bangladesh.*

Materials and methods: *This cross-sectional study with some analytical component was conducted in Chittagong Medical College Hospital including 50 histopathologically proved cases of gastric adenocarcinoma. Correlation of histological types with different clinical characteristics were determined. Frequencies were expressed as percentages and the categorical variables were compared with the Chi-square test. Statistical significance was set at a p <0.05.*

Results: *The mean age of the patients was 56.98 (± 9.55) years, most of the patients (58%) were 40-60 years of age, 58% of enrolled patients were male, 48% of patients were from lower socioeconomic class. In terms of primary tumor location, the gastric pylorus (58%) was the most prevalent subsite. Most of the patients were diagnosed as intestinal type of adenocarcinoma (74%) in locally advanced stage with moderately differentiated tumor (60%). Diffuse tumors were significantly associated with advanced histologic grade (p<0.001) and stage (p=0.043).*

Conclusion: *In conclusion, gastric adenocarcinoma occurs mainly in middle aged males and intestinal type was the most frequent subtype and most of the cancers were in advanced stage.*

Key words: Gastric adenocarcinoma; Histopathology; Lauren Classification.

INTRODUCTION

Worldwide, gastric cancer remains among the most common neoplasms and is one of the leading causes of cancer deaths.[1] Gastric cancer can be classified by the anatomical location of the primary tumor as cardia and non-cardia.[2] Gastric cancer is most importantly caused by gastric adenocarcinoma, accounting for roughly 90% of the cases.[3] Lauren's histopathological classification is widely reported in the literature and recognizes gastric adenocarcinoma as diffuse and intestinal subtypes, each with its own therapeutic and prognostic value.[3-5]

Although the etiology of gastric cancer is complex, the most important and well-studied risk factors are *Helicobacter pylori (H. pylori)* infections, environmental factors, nutritional factors, and host genetic factors, such as a positive family history of gastric cancer and/or a genetic pro-inflammatory profile.[6,7] Several environmental exposures have already been identified as risk factors for gastric cancer, including diet, smoking, bacterial infections and a variety of occupational exposures.[6,7]

Gastric cancer is the sixth most common cancer in Bangladesh, and its prevalence is 6.21%. According to the latest World Health Organization (WHO) data published in 2020 gastric cancer deaths in Bangladesh reached 6,799 or 0.95% of total deaths.[8] The absence of a screening program and less awareness regarding gastric cancer might have led to delayed medical consultation for gastric carcinoma in Bangladesh. So, the survival would generally be poor for gastric cancers. Studies regarding the epidemiologic distribution of gastric cancer in Bangladesh are lacking. The actual epidemiologic distribution of gastric cancer according to age, sex, location within the stomach, and tumor histologic types is not fully established in the southeastern part of Bangladesh.[9-11] The objective of this study was to describe the clinicopathological profile of patients with gastric adenocarcinoma presenting in a tertiary-level hospital in Chattogram, Bangladesh and to assess the clinicopathological differences between Laurén subtypes.

MATERIALS AND METHODS

This cross-sectional study with some analytical components was conducted at Chittagong Medical College, Chattogram, from September 2020 to June 2022. Before starting this study, ethical clearance was obtained from the Ethical Review Board of Chittagong Medical College (Memo No. CMC/PG/2022/8/0, Date: 07/03/2022). Informed consent was obtained from each patient. Fifty conveniently selected patients who were histopathologically diagnosed with gastric adenocarcinoma were included in this study. Patients with recurrent cases of gastric adenocarcinoma and those who had received chemo or radiotherapy for gastric adenocarcinoma were excluded.

Sociodemographic and histopathological variables (Age, Sex, socioeconomic class, habit of smoking, alcohol intake, taking dry fish, eating red meat, site of tumor, morphological variants, tumor grade and tumor stage) were collected using a case record form. Expert pathologists conducted a histopathological examination in the Department of Pathology of Chittagong Medical College. The resected specimens were fixed in 10% formalin. The paraffin blocks were sectioned with a rotary manual microtome at 5-micrometer thickness and were stained with H & E stain. The histological classification of gastric cancer was based on Lauren's criteria.[4]

The statistical analysis was carried out using the statistical package for Social Science version 28.0 for Windows (SPSS). All the data was checked and edited after collection. Patient age was reported as the means ± SD and categorized into three groups. Other variables were categorical (Socioeconomic status, habit, grading, staging, etc.) and reported as counts and percentages. The Chi-square test determined the association between two categorical variables. p value <0.05 was considered as statistical significance.

RESULTS

The age ranged between 30 and 75 years in the present study. Out of a total of 50 cases, most of the cases 29(58%) belonged to the age group of 40-60 years, with a mean age of 56.98 ± 9.55 years, 28 (56%) patients were male and most of the patients belongs to the lower or middle class. Regarding risk factors, 52% of patients were smokers, 16% of patients reported drinking alcohol, 80% of patients were taking dry fish regularly, and 62% of patients were eating red meat regularly (Table I). No evidence regarding H. pylori infection was found in the history. However, intestinal metaplasia was observed in 12% of cases.

Table I Sociodemographic characteristics and risk factors of the 50 cases of gastric adenocarcinoma

Characteristics	Count	Percent (%)
Age groups		
<40 years	04	8.0
40-60 years	29	58.0
>60 years	17	34.0
Gender		
Male	28	56.0
Female	22	44.0
Socioeconomic class		
Upper class	03	6.0
Middle class	23	46.0
Lower class	24	48.0
Risk factors		
Smoking	26	52.0
Alcohol drinking	08	16.0
Taking dry fish	40	80.0
Eating red meat	31	62.0

Most of the tumors were located in the pylorus (58%), followed by fundus (14%), body (12%), lesser curvature (8%), and greater curvature (8%). Most of the cases were intestinal type (74%). More than half (60%) of the tumors were moderately differentiated (Grade II), followed by 13 with poorly differentiated (26%) and seven with well-differentiated tumors (14%). Regarding pathological stage, 26(52%) patients were at stage pT3. Stage pT2 comprised 19 (38%) cases, and stage pT1 was found in 5(10%) cases (Table II).

Table II Anatomical site, histopathological types, grade and stage of adenocarcinoma (n = 50)

Characteristics	Count	Percent (%)
Anatomical site		
Pylorus	29	58.0
Fundus	07	14.0
Body	06	12.0
Lesser curvature	04	8.0
Greater curvature	04	8.0
Histopathologic type		
Intestinal type	37	74.0
Diffuse type	13	26.0
Histologic grade		
Well-differentiated	07	14.0
Moderate differentiated	30	60.0
Poorly differentiated	13	26.0
Pathological stage		
pT1	05	10.0
pT2	19	38.0
pT3	26	52.0

https://doi.org/10.3329/cmoshmcj.v25i1.89832

The association of gastric adenocarcinoma histopathologic types with age, sex, histologic grade, and stage were shown in Table III, which depicted that diffuse tumors were significantly associated with advanced histologic grade and stage at diagnosis.

Table III Clinicopathological differences between Laurén subtypes in 50 cases with gastric adenocarcinoma

Variables	Laurén Histological subtypes		p value*
	Intestinal (n=37)	Diffuse (n=13)	
Age groups			
<40 years	1 (2.7)	3 (23.1)	0.049
40-60 years	22 (59.5)	7 (53.8)	
>60 years	14 (37.8)	3 (23.1)	
Gender			
Male	20 (54.1)	8 (61.5)	0.640
Female	17 (45.9)	5 (38.5)	
Histologic grade			
Grade I	7 (18.9)	0 (0)	<0.001
Grade II	30 (81.1)	0 (0)	
Grade III	0 (0)	13 (100.0)	
Pathological stage			
pT1	5 (13.5)	0 (0)	0.043
pT2	18 (48.6)	3 (23.1)	
pT3	14 (37.8)	10 (76.9)	

Data were expressed as frequency and percentage (%). *Chi-square test.

DISCUSSION

The issues related to gastric carcinoma are found across the world and having a significant impact on the health of the people and affecting the health care system.[1] Although the incidence of gastric cancer is decreasing, it is one of the top ten most common cancers in Bangladesh.[12] A previous study found a very high incidence of gastric malignancies in comparison to other pathological changes in gastric endoscopic biopsy in Bangladesh, with the highest incidence in the Chattogram division. It also reflects that between 16 years and 100 years, no age is immune to gastric malignancies.[11] The present study showed that the age range of gastric adenocarcinoma was from 30 years to 70 years with the mean age of 56.98 years, with the highest prevalence in the sixth decade. According to the study of Jha et al[9] who has observed a mean age of 53 years with a range from 28 to 79 years. Moreover, the study of Jha et al. the incidence of gastric cancer ratio among the male and female was 66.7% and 33.3%.[9] Present study also revealed male preponderance [56%].

The high prevalence of risk factors such as Helicobacter pylori infection, smoking and dietary habits contribute to the significant burden of gastric cancer.[1] In the present study, 52% patient had smoking habit, 80% had the habit of taking dry fish regularly and 62% patients had the habit of eating red meat regularly. About 12% cases of the study sample showed intestinal metaplasia. Though it is not established, there might be a relation between gastric adenocarcinoma and consumption of dry fish in Chattogram region as fish processors usually use a mixture of organochlorine insecticides (Dichlorodiphenyl Trichloroethane (DDT) and heptachlor) to protect the dried fish from insect infestation.[13]

In this series, the pyloric antrum was the most common site (58%), but incidence of proximal gastric carcinoma is increasing in western countries with simultaneous decrease in distal lesion.[14] According to the study by Kassim et al. and van Der Kaaij et al. histological subtype (Lauren) in our study was of the Intestinal variant (74%).[15,16] Most of the patients in the present study had been predominately diagnosed with gastric cancer in the advanced stage with moderate or poor differentiated grades, which might be due to the absence of population-based screening in Bangladesh, like Japan, where screening is performed in individuals aged over 40 years using double-contrast barium or endoscopy.[17] In addition poor socioeconomic status and less awareness lead to delayed medical consultation in our country.

As previously mentioned, the Laurén system was developed in 1965 as a "Histo-clinical classification". After this first description of intestinal and diffuse-type gastric carcinoma, Laurén classification used as a cost-effective and widely implemented tool in gastric carcinoma and it has regained importance in the last few years due to its correlation with the molecular groups of gastric carcinoma. Several studies have variably reported association of Laurén subtypes with clinicopathological features of gastric carcinoma, including patient age, sex or macroscopic morphology.[18-20] In the present study, Laurén subtypes showed significant differences in age at diagnosis, tumor histologic grade and pathologic stage.

LIMITATIONS

The results of this study should be interpreted in the context of its strengths and limitations. This study includes patients with pure intestinal or diffuse gastric adenocarcinoma treated by curative gastrectomy. All patients were diagnosed and treated in a tertiary teaching hospital. All tumors were reviewed and pathological features were independently assessed by two pathologists following a detailed protocol. However, small sample size was the major limitation of the present study. Presence of H. pylori infection was not looked for as a causal factor.

CONCLUSION

Most of the patients with gastric adenocarcinoma in the present study were males in the older age group, who had been predominately diagnosed with intestinal type of gastric cancer in the advanced histologic grade and stage. Moreover, findings support the notion that Laurén subtypes may represent different clinicopathological and biological entities.

https://doi.org/10.3329/cmoshmcj.v25i1.89832 Volume 25, Issue 1, January 2026

RECOMMENDATIONS

More studies with a larger number of patients and different ethnic groups are needed for proper assessment of demographic features as well as planning for early detection and treatment.

ACKNOWLEDGEMENTS

Authors would like to thank all the faculty members of the Department of Pathology, Chittagong Medical College, for their support in conducting the study.

DISCLOSURE

All the authors declared no competing interest.

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https://doi.org/10.3329/cmoshmcj.v25i1.89832