

## Histopathological Patterns of Gastric Malignancy

\*Kayes MT,<sup>1</sup> Khan AH,<sup>2</sup> Rahman MA,<sup>3</sup> Das S,<sup>4</sup> Rahman MH,<sup>5</sup> Wahab MA,<sup>6</sup> Hasan MA,<sup>7</sup> Talukder SI<sup>8</sup>

Cancer incidence and mortality rose during the 20th century to become a leading cause of death. Until 1985, gastric cancer was the most common cancer worldwide with an annual incidence of nearly 700 000 cases and is one of the top ten malignancies among both sexes in Bangladesh. Risk factors, treatment protocol and prognosis vary in different histomorphological subtypes of gastric malignancy. The intestinal histological subtype of gastric adenocarcinoma, as the most common form of gastric cancer, develops in an inflammatory background induced by H.pylori related chronic gastritis and progresses to atrophic gastritis, intestinal metaplasia, glandular dysplasia and eventually adenocarcinoma. This cross sectional study was carried out in the Department of Pathology at MAG Osmani Medical College, Sylhet and the Department of Gastroenterology of MAG Osmani Medical College Hospital, Sylhet for a period of 1(one) year. In this study 40 patients of gastric malignancy were taken as sample. Out of 40 patients males were predominant than females which was 31(77.5%) and 9(22.5%) respectively. Among 40 patients most were in the age group of 41 to 60 years followed by more than 60 years and less than or equal to 40 years which were 23(57.5%), 13(32.5%) and 4(10%) respectively. The mean age ( $\pm$ SD) of this study population was 56.95 ( $\pm$  10.06). Among 40 carcinoma patients most of the lesions were excavated lesions followed by exophytic and flat or depressed type which were 28(70%), 11(27.5%) and 1(2.5%) respectively. Among 31 male patients intestinal type of gastric carcinoma was found more than diffuse type which were 26(83.9%) and 5(16.1%) respectively. Within 9 female patients intestinal type of gastric carcinoma was found more than diffuse type which were 8 (88.9%) and 1 (11.1%) respectively. Among the 40 patients no other types of gastric malignancy except adenocarcinoma were found.

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1. \*Dr. Mohmmad Tanvir Kayes, Assistant Professor, Department of Pathology, Shaheed Syed Nazrul Islam Medical College, Kishoreganj. shovon.tanvir@yahoo.com
2. Professor Dr. Md. Amjad Hossain Khan, Professor and Head, Department of Pathology, Womens Medical College, Sylhet
3. Dr. Md. Habibur Rahman, Professor, Department of Gastroenterology, Sir Salimullah Medical College, Dhaka
4. Dr. Sujit Das, Assistant Professor, Department of Pediatrics, Shaheed Syed Nazrul Islam Medical College, Kishoreganj
5. Dr. Md. Hafizur Rahman, Medical Officer, Department of Radiology and Imaging, 250 Bed General Hospital, Kishoreganj
6. Dr. Mohammad Abdul Wahab, Junior Consultant, Department of Anaesthesia, 250 Bed General Hospital, Kishoreganj
7. Dr. Mohammad Anwarul Hassan, Junior Consultant, Department of Dermatology, Dhaka Medical College, Dhaka.
8. Dr. Sadequel Islam Talukder, Assistant Professor, Department of Pathology, Shaheed Syed Nazrul Islam Medical College, Kishoreganj

\*For correspondence

## Introduction

Cancer incidence and mortality rose during the 20th century to become a leading cause of death.<sup>1</sup> Until 1985, gastric cancer was the most common cancer worldwide with an annual incidence of nearly 700 000 cases.<sup>2</sup> Stomach cancer is one of the top ten malignancies among both sexes in Bangladesh.<sup>3</sup> Among the gastric malignancy adenocarcinoma is most common.

There is a wide variation in the incidence of gastric cancer in different geographical regions. The highest risk areas with an age standardized incidence rate (ASR) of more than 20 per 100,000 person-years in men are: Japan, Korea, China, Chile, Costa-Rica and Brazil.<sup>4</sup> The intermediate risk areas are those populations with an ASR between 10 and 20 which include: Italy, the UK, Germany, the Netherlands and Turkey. Low risk populations for gastric cancer are those with an ASR of less than 10 and are: the USA, Canada, Sweden, Denmark, Egypt, India and Australia.<sup>5</sup>

Approximately 90% of gastric cancers are adenocarcinomas.<sup>6</sup> These can be classified according to their differentiation or according to the histomorphological classification of Lauren, which divides the tumours into 'intestinal' and 'diffuse'.<sup>6</sup> Intestinal tumours are usually exophytic, often ulcerating, and are associated with intestinal metaplasia of the stomach. Diffuse tumours are poorly differentiated infiltrating lesions which lead to thickening of the stomach histology.

Risk factors, treatment protocol and prognosis vary in different histomorphological subtypes of gastric malignancy. The intestinal histological subtype of gastric adenocarcinoma, as the most common form of gastric cancer, develops in an inflammatory background induced by *H. pylori* related chronic gastritis and progresses to atrophic gastritis, intestinal metaplasia, glandular

dysplasia and eventually adenocarcinoma.<sup>4</sup> Many environmental factors including smoking, high salt intake, and a diet with an insufficient level of antioxidants are involved in the pathogenesis of gastric cancer. Endogenous and host factors, including those related to male gender, and several genetic backgrounds are known risk factors to a lesser extent.<sup>4</sup> In addition to the well-established risk factors of gastric cancer, which are mainly applicable to classic non-cardia cancer, gastroesophageal reflux disease (GERD) is one of the main risk factors of cardia cancer.

## Methods

This cross sectional study was carried out in the Department of Pathology, MAG Osmani Medical College, Sylhet and Department of Gastroenterology of MAG Osmani medical College hospital, Sylhet. Patients were selected consecutively from endoscopic unit of Department of Gastroenterology of Sylhet MAG Osmani Medical College Hospital, Sylhet.

### *Study procedure*

The clinical histories of the patients were noted. The patients were examined thoroughly. All the findings, previous history and reports of investigations were recorded in a form prepared for this purpose. Clinical features suggestive of carcinoma stomach were selected for upper GI endoscopy. The endoscopic examinations were performed using fibre-optic/video endoscope and biopsies were taken from the suspected lesion of the stomach for histopathology. Biopsy samples were processed in the histopathology laboratory and paraffin section was done. The slides were stained with Haematoxylin and Eosin. The stained slides were examined under light microscope.

### Study Period

This study was carried out for a period of 1(one) year from 01.01.2009 to 31.12.2009.

### Sample size

Forty (40) gastric cancer patients were taken as sample.

### Sampling Technique

It was a convenient consecutive sampling.

### Selection criteria

#### Inclusion criteria

- All patients histopathologically confirmed as gastric malignancy.
- Both male and female patients.

#### Exclusion criteria

- Patients who were refuse to do endoscopy.
- Failed endoscopy.
- Diagnosis not proved by histopathology
- Severely ill patients.

### Ethical consideration

The aims and objectives of the study were explained to the patients in easily understandable local language and then informed consent was taken from each patient. It was assured that all informed and records were kept confidential and the procedure was helpful for both the physician and the patients in making rational approach of the case management.

### Results

A total of 40 patients of gastric malignancy attending the gastroenterology department of Sylhet MAG Osmani Medical College Hospital were included in this study. Five to six endoscopic biopsy samples were taken from suspected lesion of each patient and preserved into the formalin containing bottle for histopathological evaluation. With taking permission of the patient, relevant questions were asked as per prescribed data sheet.

The sample group of this study had endoscopically visible and histopathologically proved malignant lesion.

Table I: Sex distribution of study population

Male	31 (77.5) <sup>#</sup>
Female	9 (22.5)
<b>Total</b>	<b>40 (100.0)</b>

<sup>#</sup>Figure within parentheses indicates in percentage.

Table I shows the distribution of sex by among the study group. Out of 40 patients male was predominant than female which was 31(77.5%) and 9(22.5%) respectively.

Table II: Age distribution of study population

Age(in year)	Case
≤40	4 (10.0) <sup>#</sup>
41-60	23 (57.5)
>60	13 (32.5)
Total	40 (100.0)
Mean ± SD	56.95 ± 10.06

<sup>#</sup>Figure within parentheses indicates in percentage.

Table II shows the distribution of age. Among 40 patients, most were in the age group of 41 to 60 years followed by more than 60 years and less than or equal to 40 years which were 23(57.5%), 13(32.5%) and 4(10%) respectively. The mean age (±SD) of this study population was 56.95 (± 10.06).

Table III: Distribution of type of lesion in cancer patients

Type of lesion	Frequency	Percent
Excavated lesion	28	70.0
Exophytic	11	27.5
Flat or depressed	1	2.5
Total	40	100.0

Table III shows the distribution of type of lesion in cancer patients. Among 40 patients most of the lesions were excavated lesions followed by exophytic and flat or depressed type which were 28(70%), 11(27.5%) and 1(2.5%) respectively.

Table IV: Distribution of biopsy site in cancer patients

Site of biopsy	Frequency	Percent
Pylorus & Antrum of stomach	25	62.5
Fundus of stomach	4	10.0
Body of stomach	6	15.0
Body & fundus of stomach	2	5.0
Cardia	1	2.5
Body & antrum	1	2.5
Cardia & fundus	1	2.5
Total	40	100.0

Table IV shows the distribution of site of biopsy in cancer patients. Among 40 patients the most common site of the biopsy was done from the pylorus & antrum of the stomach followed by body and fundus of the stomach which were 25(62.5%), 6(15%) and 4(10%) respectively. Biopsy from both body and fundus of the stomach was done in 2(5%). One (2.5%) case of each of the site was done from cardia, body & antrum and cardia & fundus

Table V: Distribution of histopathological sub type of gastric cancer in different sexes

Histopathological sub type	Sex		p*
	Male	Female	
Intestinal	26(83.9) <sup>#</sup>	8(88.9)	0.999
Diffuse	5 (16.1)	1(11.1)	
Total	31(100.0)	9 (100)	

\*Fisher's exact test was done to measure the level of significance.

<sup>#</sup>Figure within parentheses indicates in percentage.

Table V shows the distribution of histopathological subtype by sex. Among 31 male patients intestinal type of gastric carcinoma was found more than diffuse type which were 26(83.9%) and 5(16.1%) respectively. Within 9 female patients intestinal type of gastric carcinoma was found more than diffuse type which were 8 (88.9%) and 1 (11.1%) respectively. No statistical significance was found between histopathological subtype and sex (p=0.999).

### Discussion

Gastric cancer was the most common and most lethal cancer in the world during most of the 20th century.<sup>7</sup> Gastric cancer still ranks as the fourth most common cancer and the second most frequent cause of cancer deaths, accounting for 10.4% of cancer deaths worldwide.<sup>8</sup> Gastric cancer is usually preceded by a variety of benign gastric diseases or conditions such as atrophic gastritis, pernicious anemia, gastric ulcer, gastric polyps and Ménétrier's disease (hypertrophic gastropathy). Dysplasia and adenoma are neoplastic lesions preceding to malignancy with time. In all precancerous conditions, atrophic gastritis is the uniform, common factor underlying the development of the cancer. The risk of gastric cancer rises with an increase in the severity and extent of atrophic gastritis. The risk is especially high in patients with severe atrophic gastritis, which is restricted to the antrum or, in particular, if the severe atrophy occurs in both antrum and corpus.<sup>7</sup>

The majority of gastric neoplasms are adenocarcinoma, which can be subdivided with each subtype exhibiting different behavior.<sup>1</sup> The most widely used histological classification was proposed by Lauren.<sup>1</sup> It was defined two main types: The intestinal or "epidemic" form and a diffuse variety. The former is more prevalent in the elderly and men. It has a better prognosis and is more

frequent in high risk areas.<sup>1</sup> The diffuse adenocarcinoma has a more uniform incidence. It is poorly differentiated with a worse prognosis and its incidence, unlike the intestinal variety, has shown no tendency to decline. Histological type is not usually recorded on death certificates which make collection and evaluation of data more difficult. In studies that analyzed histological type, the intestinal variety was most common.<sup>9</sup>

Classification of gastric carcinoma<sup>10</sup>

**Bormann, 1926**

Type I (polypoid)  
Type II (fungating)  
Type III (ulcerated)  
Type IV (infiltrative)

**Stout (Atlas of Tumor Pathology), 1953**

Fungating  
Penetrating  
Spreading  
Superficial spreading  
Linitis plastica  
No special type

**Lauren, 1965**

Intestinal  
Diffuse  
Mixed

**Ming, 1977**

Expanding  
Infiltrative

**Japanese Society for Gastric Cancer, 1981**

Papillary  
Tubular  
Poorly differentiated  
Mucinous  
Signet ring.

**World Health Organization, 2000**

Adenocarcinoma  
Papillary adenocarcinoma  
Tubular adenocarcinoma  
Mucinous adenocarcinoma  
Signet-ring cell carcinoma  
Adenosquamous carcinoma  
Undifferentiated

Small cell carcinoma

Carcinoid tumor

Others

In this study 40 patients of both sexes who were endoscopically suggestive and histopathologically proved of gastric carcinoma were taken as case. The distribution of sex by group among the study population were observed in this study (Table I). Out of 40 patients male was predominant than female which was 31(77.5%) and 9(22.5%) respectively. No statistical significance was found in sex distribution ( $p=0.130$ ). Similar findings was also found by Sipponen et al.<sup>11</sup> In another study Sipponen and Correa<sup>12</sup> stated that the sex is an independent risk factor for gastric carcinoma. The reason of the global consistency of the male and female pattern suggests that the differences in the pathogenesis of Gastric carcinoma between males and females are based on some basic biological differences between the sexes, rather than being simply a result of environmental factors alone.<sup>12</sup> In this respect, two options are conceivable. First, male sex is somehow linked to an inherent susceptibility to gastric cancer, or, alternatively, female sex, i.e., female hormones, is protective. The second possibility is that sex differences interact with

environmental influences, and this determines the risk.<sup>12</sup>

This study shows that among 40 patients, most were in the age group of 41 to 60 years followed by more than 60 years and less than or equal to 40 years, which were 23(57.5%), 13(32.5%) and 4(10%) respectively. The mean age ( $\pm$ SD) of this study population was 56.95 ( $\pm$  10.06). This finding is similar to Herrera-Goepfert et al.<sup>13</sup> They concluded that the Mexican population >50 years of age was selectively affected by gastric carcinoma.

This study reveals, most of the lesions were excavated lesions followed by exophytic and flat or depressed type which were 28(70%), 11(27.5%) and 1(2.5%) respectively (Table III). Similar findings were also reported by Tanabe et al.<sup>14</sup>

Study shows that most common site of cancer within the stomach was pylorus and antrum followed by body and fundus of the stomach which were 25(62.5%), 6(15%) and 4(10%) respectively. Cancer aroused from both body and fundus of the stomach was found in 2(5%) cases. One (2.5%) case of each aroused from cardia, body & antrum and cardia & fundus were found (Table IV). These findings is consistent with the findings of others.<sup>15,10</sup> There is now some evidence that there may be a different etiology for tumors located in gastric cardia and antrum. Demographic differences and a diverging incidence trend point to the fact that the two tumors may be epidemiologically distinct and therefore the anatomic sub site of gastric tumor should be taken into account in studies of etiology and carcinogenesis of this fatal cancer.<sup>16</sup> Gastric cardia cancer has also been shown to have a different clinical and biological behavior from that of distal gastric cancer and patients with proximal gastric cancer have worse outcomes and shorter survival times as compared to patients with antral gastric cancer.<sup>17</sup>

Distribution of histopathological subtype of gastric carcinoma in different sexes has been shown in table V. This shows Intestinal type of gastric carcinoma occurs more commonly in both sexes than the diffuse type. Similar result was observed in other studies.<sup>18,19</sup> Among the 40 patients no other types of gastric malignancy except adenocarcinoma are found.

### Conclusion

In conclusion, the findings of this study shows that histopathological subtypes vary among male and female in different age group. So proper histopathological subtyping is essential for better patient management.

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