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Original Research Article

# Clinicopathological Features of Gastric Cancer: A Retrospective Study from a Regional Cancer Center, Odisha

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**Abstract**

**Background:** Gastric cancer (GC), is a common malignancy that poses a significant health burden in India. Although clinicopathological studies of GC helps to generate baseline data and guide future health care strategies and management but there is limited literature on this regard, particularly in this geographical part. In this study, we designed to evaluate the clinicopathological profile of gastric cancer with an aim to detect the cancer early for reducing the morbidity and mortality.

**Materials and Methods:** During this hospital-based retrospective study, clinicopathological information was extracted from hospital records of GC patients who underwent subtotal or total gastrectomy between the years 2018 and 2020.

**Results:** A total 279 cases of gastric carcinoma were included out of which male-to-female ratio was 2.4:1. The mean age of the study population was 54.47±12.2 years with range 18 to 82 years. The frequency of gastric cancer was highest in the antrum. Adenocarcinoma was the most frequent histologic subtype. The majority of our patients presented at an advanced stage locally.

**Conclusion:** The present study confirms that the incidence of gastric cancer surges between the fourth and sixth decades. Males are disproportionately afflicted. The most prevalent symptom is abdominal pain, which is frequently vague and therefore disregarded. The majority of patients exhibited advanced disease. Raising public awareness can help us detect the disease earlier and develop a more effective treatment.

**Keywords:** Gastric Cancer, Clinicopathological Profile, Advanced Stage.



## Introduction

Gastric cancer (GC) also known as stomach cancer, is a common malignancy that poses a significant global health burden. According to global data (Globocan 2020), it is the fifth most prevalent malignant tumor in the world in 2020, with approximately 1.1 million new cases, and the fourth primary cause of cancer-related mortality, with approximately 800,000 fatalities [1]. The incidence of GC among men is roughly double that of women.

Due to cultural and dietary distinctions, the prevalence of GC differs across geographic regions. In countries in Eastern Asia and Eastern Europe, the incidence is increasing due to the high prevalence of established risk factors, whereas incidence and mortality have been declining in the majority of the world, largely due to economic development and the adoption of preventative measures against the leading risk factors [2].

In India, it is the fifth most prevalent cancer in men and the seventh most prevalent cancer in women [2, 3]. The incidence fluctuates significantly across India. The incidence is greatest in the southern and north-eastern states, with Mizoram recording rates of 50.6% for men and 23.3% for women, adjusted for age [4]. In Odisha, the prevalence of GC is also high [5]. There is limited literature on the clinicopathological presentation of GC, particularly in this region. It is essential to have baseline information regarding the appearance of GC in each region so that future health care strategies and management of GC can be founded on this information. In this study we aimed to analyze the demographics, lifestyle factors, presenting symptoms and histopathological features of GC cases to reduce the morbidity and mortality by early diagnosis.

## Materials and Methods

This hospital-based retrospective investigation was conducted between 2018 and 2020 at the Acharya Harihar Postgraduate Institute of Cancer, a tertiary care institution in Odisha. Histopathologically confirmed primary cases of GC were included in this study. The study's final

analysis included clinical parameters such as age, sex, smoking and alcohol dependence, clinical presentation, type of surgery, final detailed histopathology, TNM staging, and stage aggregation. Macroscopic characteristics

included tumor location, size, and appearance. The histopathology type, depth of invasion, lymphovascular invasion (LVI), perineural invasion (PNI), margins, residual tumor, omental deposits, number of nodes resected, number of positive nodes, largest node resected, TNM staging, and stage grouping were described for gross gastrectomy specimens.

## Results

A total 279 cases of GC were included. All patients underwent surgical resection following an endoscopy and biopsy, based on clinical and radiographic characteristics. The ratio of men to women in the sample cohort was 2.4:1. The age distribution of the study population ranged from 18 to 82 years, with a mean ±SD of 54.47±12.2 years. Males and females had respective mean ages of 57.04±9.08 and 49.01±10.04 years. There were 34 (12.1 %) cases below 40 years old, with 13 (38.23 %) male cases and 21 (61.76 %) female cases (Table1)

**Table 1: Age and sex wise distribution of carcinoma stomach cases.**

| Numbers | Male | % | Female | % | Total | % |
|---|---|---|---|---|---|---|
| <30 | 2 | 1.02 | 5 | 6.10 | 7 | 2.51 |
| 31-40 | 11 | 5.58 | 16 | 19.51 | 27 | 9.68 |
| 41-50 | 46 | 23.35 | 26 | 31.71 | 72 | 25.81 |
| 51-60 | 62 | 31.47 | 21 | 25.61 | 83 | 29.75 |
| 61-70 | 60 | 30.46 | 11 | 13.41 | 71 | 25.45 |
| 71-80 | 13 | 6.60 | 3 | 3.66 | 16 | 5.73 |
| >81 | 3 | 1.52 | 0 | 0.00 | 3 | 1.08 |
| Total | 197 | 100 | 82 | 100 | 279 | 100 |

A history of addiction was present in 65.23 percent of cases. A total 129 patients (46.23%) were found to be addicted to both smoking and alcohol consumption, while only 20 (7.16%) were addicted to smoking and 83 (29.74%) were addicted to alcohol. None of the women in the study were addicted to alcohol or cigarettes. In 207 (74.19%) patients, vague abdominal distress was the most prevalent presenting symptom, followed by nausea (69.53%), vomiting (67.0%). (Figure 1).

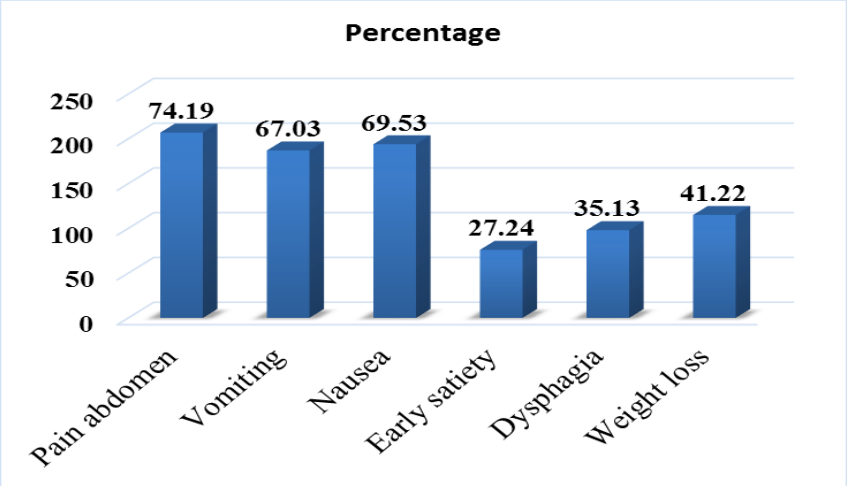


**Figure 1: Presenting symptoms of carcinoma stomach.**

Endoscopic examination revealed growth in the distal end of stomach in 235 (60.58%) cases and in the proximal end in 46 (16.49%) cases. The preponderance of patients, 48%, were treated with radical distal gastrectomy. The specimen obtained postoperatively was examined. The dimension of the tumor varied between 1 cm and 7 cm, with a mean measurement of 4.45 cm. 47.31% of patients exhibited ulcerative growth, while 67 (24.01%) exhibited ulcer infiltrative growth.

The preponderance of patients, 89 (31.9%), had classic adenocarcinoma, followed by tubulosecretory and diffusely infiltrative. In 153 (54.84%) cases, the growth lacked differentiation. In 127 (45.52%) cases, the profundity of infiltration was up to the sub serosa. In 197 (70.61%) cases, vascular invasion was observed, and in 145 (51.97%) instances, perineural invasion was observed. The margin was positive in 47 (16.85%) patients (Table 2)

**Table 2: Clinico-pathologic characteristics of patients with gastric cancer.**

| Pathological Features | | Numbers | % |
|---|---|---|---|
| Tumor size | < 5cm | 209 | 74.91 |
| | > 5cm | 70 | 25.09 |
| Tumor site | Cardia | 46 | 16.49 |
| | Body | 64 | 22.94 |
| | Pylorus | 71 | 25.45 |
| | Antrum | 98 | 35.13 |
| Appearance | Proliferative | 21 | 7.53 |
| | Ulcer proliferative | 59 | 21.15 |
| | Ulcer infiltrative | 67 | 24.01 |
| | Ulcerative | 132 | 47.31 |
| Hito-type | Adenocarcinoma | 89 | 31.90 |
| | Tubulosecretory | 58 | 20.79 |
| | Mucinous | 42 | 15.05 |
| | Tubular | 36 | 12.90 |
| | Diffuse | 54 | 19.35 |
| Grade | Well differentiated | 50 | 17.92 |
| | Moderate differentiated | 76 | 27.24 |
| | Poorly differentiated | 153 | 54.84 |
| Depth of infiltration | Lamina propria | 12 | 4.30 |
| | Submucosa | 5 | 1.79 |
| | Muscularis propria | 36 | 12.90 |
| | Sub serosa | 127 | 45.52 |
| | Serosa | 99 | 35.48 |
| Vascular Invasion | Present | 82 | 29.39 |
| | Absent | 197 | 70.61 |
| Perineural Invasion | Present | 145 | 51.97 |
| | Absent | 134 | 48.03 |
| Margin | Present | 47 | 16.85 |
| | Absent | 232 | 83.15 |
| Lymph node | Positive | 171 | 61.29 |
| | Negative | 69 | 24.73 |

Pathologically, the preponderance of patients, 137 (49%), were classified as T3, 1% as N3a, and none as having distant metastases. Figure 2 displays that the majority of patients (71%) were in Stage III.

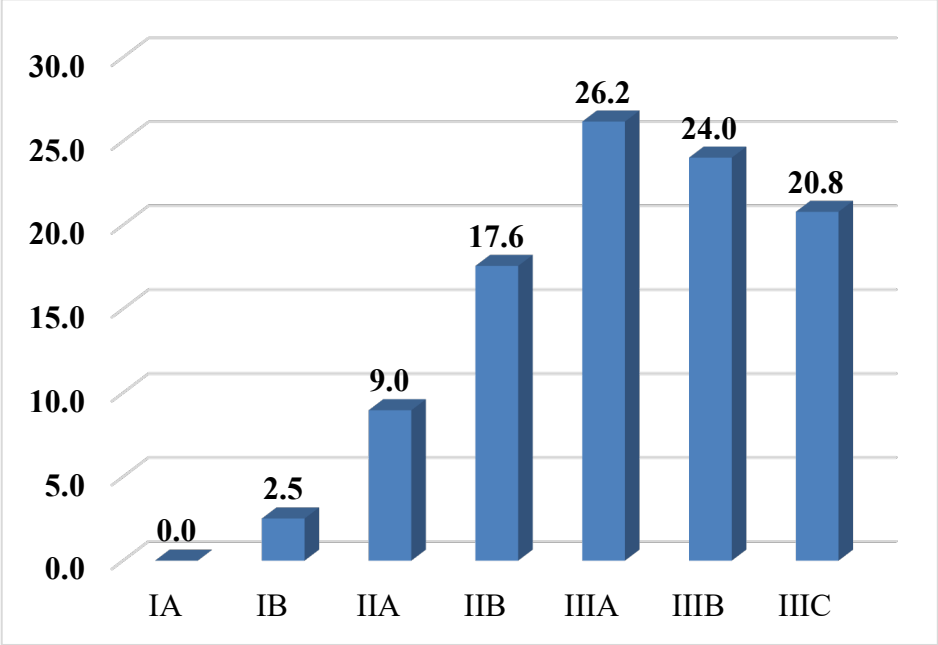


**Figure 2: Pathological staging of carcinoma stomach.**

## Discussion

The result of the study found that the incidence of GC peaks between the fifth and sixth decades and then declines after age 60 which was consistent with the previous reports [6, 7]. In our study, we found the male preponderance with male-to-female ratio was 2.40:1. There is a male preponderance of the disease across the globe [8, 9, 10]. It has been observed that, both environmental and genetic risk factors would contribute to the patterns of sex difference in gastric cancer. High prevalence of H. pylori infection, more consumption of tobacco and alcohol and stressful work environment in men could result in a higher risk of GC [11, 12]. In female, a meta-analysis had supported the hypothesis that longer exposure to oestrogen effects of either ovarian or exogenous origin may decrease risk of GC. The underlying reasons are not yet clear but various mechanisms have been suggested. There is evidence that oestrogen may lead to increased expression of trefoil factor proteins, which protect mucous epithelia or inhibit oncogene expression [11].

In this present study, the majority of females exhibited between the ages of 40 and 50, while the majority of males presented between the ages of 50 and 60. This observation is consistent with previous research indicating that females are diagnosed with GC earlier than males [12].

Equal provision of cancer care is not enough to correct sex difference, but more attention should be payed to male disadvantage in GC. These findings call for sex-sensitive health policy to cope with the global gastric cancer burden.

As symptoms of abdominal pain with nausea, vomiting and weight loss was found in significant numbers of GC cases in this present study as well as previous studies [3, 13, 14]. Healthcare providers should alert about the possibility of gastric cancer.

Our findings revealed that most common site of tumor was distal end of stomach (60%) which is consistent with other studies [3]. Proximal gastric cancer (PGC) was also found in 17% cases. In previous reports, increased incidence of tumor occurrence in proximal end has also been noted [15,16,17]. This may be related to many factors, including Helicobacter pylori infection and eating habits. A meta-analysis and subgroup analysis found that the 1-year overall survival (OS) of PGC patients was lower than that of distal gastric cancer (DGC) patients. Furthermore, the 3- and 5-year OS rates of PGC patients were lower than those of DGC patients in eastern countries, but no significant differences were observed in western countries [18].

The prognosis of PGC and DGC is expected to gradually improve due to increased availability of diagnostic facilities, enhanced effectiveness of multimodal treatments, the promotion of cancer screening and early detection programs, and the emergence of new surgical approaches. However, the results remain controversial, necessitating further clinical validation in future studies.

In 74.91% of cases, the tumor size was less than 5 cm. In 47.31% of patients, the growth was ulcerative in appearance, followed by ulceroinfiltrative growth. In 31.9% of cases, the histopathology type was conventional adenocarcinoma, in 20.79% of cases it was tubulosecretory, and in 19.35% of cases it was diffusely infiltrative. This finding is also consistent with the established literature [19]. In 45.52 % of patients, the growth had penetrated the sub serosa.

Perineural invasion (PNI) was positive in (51.97%) while lymphovascular invasion (LVI) was positive in the (29.39%) of cases. In previous studies it has also been observed that GCs has a high incidence of LVI/PNI, which was closely associated with disease progression. LVI/PNI could serve as an independent risk factor for lymph node status, tumor size and the depth of invasion as well as a range of other biological variables on multivariate analysis. Large prospective studies are now needed to establish PNI/LVI as an independent prognostic marker for gastric cancer. These findings will be helpful in predicting survival outcomes more accurately and establishing individualized treatment plans [20, 21].

In 83.15 % of the cases, margin was absent. The vast majority of large tumors were inadequately differentiated, with infiltration into the sub serosa and lymph node metastasis. The majorities of the smaller tumors were also well-differentiated, did not involve lymph nodes, and were of lower stages. The current analysis confirms previous research that well-differentiated cancers manifest earlier than poorly differentiated tumors [22, 23].

The average size of the largest resected node was 1.6 cm, and there were on average 21 nodes removed. None of the assessed patients had a metastatic disease. Seventy percent of the patients had stage III disease. As opposed to early gastric cancer, the majority of patients presented with locally advanced stomach malignancies. However, because of awareness and strict screening systems, the majority of patients in Western nations are in the early stages [24]. This highlights the need for regular endoscopy and biopsy for minimally symptomatic patients for early diagnosis.

## Conclusion

The findings of the current study demonstrate that the prevalence of stomach cancer often rises between the fourth and sixth decade. The majority of those affected are men. The most typical presentation, which is usually ambiguous and disregarded, is abdominal pain. Most of the patients

had advanced disease when they first arrived. Public education can help us identify the illness earlier and provide a more effective treatment.

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