

# A Hospital Based Retrospective Assessment Correlation between the Clinic-Pathological Factors and Gastric Cancer

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## Abstract

**Aim:** To find correlation between clinical and pathological factors of gastric cancer in Bihar region, India.

**Material and methods:** This retrospective study was carried out Department of Pathology, Lord Buddha Koshi Medical College & Hospital, Saharsa, Bihar, India, for the period of 1.5 year. The study includes total 300 patients who fulfilled the inclusion and exclusion criteria.

**Results:** Of these 300 patients, 185 (61.7%) underwent distal gastrectomy, 12 (4%) proximal gastrectomy via abdomen and 72 (24.0%) via thorax, and 31 (10.3%) underwent total gastrectomy. Distal and total gastrectomy had more numbers of clearances of lymph nodes than the other operational approaches. The postoperative complications occurred in 26 patients 8.7%. The overall mortality was 2 (0.66%). patients 8.7%. The overall mortality was 2 (0.66%). Multiple regression analysis demonstrated that sex, location of tumor, tumor diameter, depth of tumor invasion and differentiation play an important role in the metastasis of lymph nodes

**Conclusion:** This retrospective study has shown that clinicopathological characters in gastric cancer varied with sex, location, and diameter of the tumor.

**Keywords:** gastric cancer, pathology, metastasis.

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## Introduction

Gastric cancer is a complex disease that is caused by a number of different factors. In 2018, it was ranked as the fifth most frequent form of cancer and the third top cause of death from cancer around the world. [1,2]

It has been estimated that approximately seventy percent of those diagnosed with stomach cancer will pass away from the disease. [3] The mortality rate associated with gastric cancer is much greater than that of other types of cancer, such as liver and breast cancers. [4] On the other hand,

the incidence and mortality of stomach cancer vary geographically. [3]

The epidemiological and clinicopathological characteristics of gastric cancer still largely remain uncertain, although some risk factors have been identified in the study. It has been reported that the survival rates were lower among smokers, alcohol drinkers, obesity and people who have the symptom of oesophageal acid reflux and consume pickled, salty and smoked food. [5, 6] Studies also suggested that the incidence

rate of gastric cancer was highly correlated with age, especially among patients aged between 50 and 70 years old. [7,8] It has been reported that gastric carcinoma is one of the heaviest burdens of cancer-related cost, the absolute numbers of gastric cancer cases and the prognosis remain big issues in the health programmes. [9]

The current most popular therapy for gastric cancer is surgery combined with chemotherapy. Surgery is the most preferred treatment for gastric carcinoma, but the survival rate of patients undergoing surgery remains very low. Previous studies have revealed that the average survival time of patients with advanced gastric cancer is <12 months [10,11]. Therefore, how to timely assess the condition, judge the prognosis risk after therapy and develop a reasonable postoperative care programme becomes a vital part of gastric cancer treatment. [12,13] Many clinicopathological factors, including clinical stage, tumour size, infiltration depth, Lauren classification and lymph node metastasis rate, might jointly influence the prognosis in patients with gastric carcinoma. [14,15] It is important but challenging to identify the most significant and independent factors associated with prognosis since many factors are highly correlated. To have a systematic comprehension of gastric carcinoma and to identify independent risk factors on gastric cancer patients, we conducted the current study.

## Material and methods

This retrospective study was carried out in the Department of Pathology, Lord Buddha Koshi Medical College & Hospital, Saharsa, Bihar, India, for the period of 1.5 year. The study includes total 300 patients.

We analyzed the following clinicopathologic and surgical factors: age, sex, hemoglobin, operation manners, operation time, and amount of transfusion during operation, postoperative hospital stay, postoperative complications, positive proximal margin, location of tumor, tumor size, differentiation, depth of tumor invasion, lymph nodes and lymphatic metastasis rate.

Frequency of positive lymph nodes = numbers of metastatic lymph nodes / all lymph nodes excised  $\times$  100%.

## Results

Of these 300 patients, 185 (61.7%) underwent distal gastrectomy, 12 (4%) proximal gastrectomy via abdomen and 72 (24.0%) via thorax, and 31 (10.3%) underwent total gastrectomy. Distal and total gastrectomy had more numbers of clearances of lymph nodes than the other operational approaches. The postoperative complications occurred in 26 patients 8.7%. The overall mortality was 2 (0.66%). (Table 1)

**Table 1 Comparison of operation manner with numbers of lymph nodes, time for operation, amount of blood transfusion during operation, hospitalization days and complications ( $x \pm s_x$ )**

| Manners of operation             | N=300 | Numbers lymph nodes | Time for operation (hours) | Amount of blood transfusion (mL) | Hospitalization stays (days) | Complication (%) |
|----------------------------------|-------|---------------------|----------------------------|----------------------------------|------------------------------|------------------|
| Distal gastrectomy               | 185   | 10.4 $\pm$ 0.2*     | 3.1 $\pm$ 0.02             | 406.3 $\pm$ 14.7*                | 15.4 $\pm$ 0.9               | 8.8              |
| Proximal gastrectomy via abdomen | 12    | 8.4 $\pm$ 0.3       | 4.1 $\pm$ 0.1*             | 616.4 $\pm$ 41.1*                | 17.6 $\pm$ 1.7               | 16*              |

|                                 |    |             |            |              |            |        |
|---------------------------------|----|-------------|------------|--------------|------------|--------|
| Proximal gastrectomy via thorax | 72 | 8.1± 0.1    | 3.1 ± 0.01 | 755.1 ± 18.3 | 14.8± 0.8  | 1.3    |
| Total gastrectomy               | 31 | 12.6 ± 0.4* | 4.2 ± 0.2* | 742.2 ± 44.9 | 18.6 ± 1.5 | 11.6   |
| <i>P</i>                        |    | <0.0001     | <0.0001    | <0.0001      | >0.05      | <0.001 |

\*Compared with other operative approaches

Multiple regression analysis demonstrated that sex, location of tumor, tumor diameter, depth of tumor invasion and differentiation play an important role in the metastasis of lymph nodes. (Table 2)

**Table 2 Multi-factors analysis of lymphatic metastasis in gastric patients**

| Related factors   | Regression coefficient | Standard error | Standard regression coefficient | <i>P</i> |
|-------------------|------------------------|----------------|---------------------------------|----------|
| Constant          | -22.4                  | 7.3            |                                 | 0.001    |
| Age               | -0.006131              | 0.071          | -0.20                           | 0.431    |
| Sex               | -6.466                 | 2.029          | -0.088                          | 0.001    |
| Tumor location    | 2.297                  | 0.699          | 0.081                           | 0.002    |
| Diameter of tumor | 2.379                  | 0.479          | 0.151                           | 0.0001   |
| Depth of invasion | 7.031                  | 0.799          | 0.291                           | 0.0001   |
| Differentiation   | 3.699                  | 1.133          | 0.089                           | 0.001    |

## Discussion

Gastric cancer remains one of most common causes of death. Although the etiology of gastric cancer is still unclear, but studies have shown that many factors are associated with the development, metastasis of gastric cancer, and recurrence after operation [16-18]. Recent studies suggest that infection with *Helicobacter pylori* may play an important role in the development of gastric cancer [19,20]. It has been proposed that *Helicobacter pylori* infection may produce acute and chronic gastritis, intestinal metaplasia, dysplasia, and eventually resulting in gastric cancer. Some abnormal expression [21,22]. in gene is involved in carcinogenesis of gastric cancer such as matrix metalloproteinases gene, *p53* gene and dinucleotide repeat sequence gene. Abnormal contents of some trace elements may also be one of the risk factors in gastric cancer [23,24].

Early gastric cancer (EGC) has been considered to be a form of gastric malignancy with a relatively good long-term prognosis compared to that of advanced gastric cancer because of rare metastasis in lymph nodes [25,26]. In Japan, EGC is diagnosed in 30%-50%, due to partly at least the extensive use of endoscopy and mass screening programs [27,28]. In this study, the proportion of EGC diagnosed in all patients is 92 (15.33%) similar to the proportion in the United States and Europe [29,30]. In recent years, endoscopic treatment has become increasingly popular as an alternative to surgical treatment of patients with EGA in hope of offering superior quality of life (QOL) [31]. However, because of presence of metastasis in 10%-20% and skip metastasis of lymph nodes, whether the rationale for a standard resection with systematic lymphadenectomy is necessary is still a controversial issue [32].

Different operative approaches were carried out according to the different locations of the tumor. In our study, the number of lymph nodes excised were the largest in total gastrectomy, followed by distal gastrectomy which may be related to the resection of all or most parts of momentum. The number of lymph nodes excised in proximal gastrectomy via a trans abdomen was similar to via trans thorax. There was shorter time for operation and lower frequency of complication in proximal gastrectomy via transthorax while lower blood transfusion in proximal gastrectomy via trans abdomen. The postoperative hospitalization stay and the positive resection margin was same between them. The complications varied among different operations: gastric retention was common in distal gastrectomy while thorax effusion and infection of lung were mainly found in total gastrectomy.

Although the overall incidence of gastric cancer has remained stable in the West, there is well- documented shift from distal to proximal lesion. The clinical relevance of this shift is that the overall prognosis for patients with proximal gastric cancer is worse than for those with distal tumor. This difference in survival may be attributed to a variety of factors, ranging from an increased biologic aggressiveness of proximal tumors to an advanced stage of presentation [33,34]. In study, a higher frequency of positive lymph nodes was found in gastric cancer located on corpus and the fundus which may be associated with the larger diameter of the tumor in corpus and the fundus. In tumors with larger diameters there were worse differentiation, deeper infiltration, and higher frequency of positive lymph nodes. Apparently, the prognosis will be worse in these patients. The present results also show that the more proximal lesions, bad differentiation, and the higher >35% frequency of positive lymph nodes can be found in female than in male. The numbers of metastatic lymph nodes play an

important role in the long-term outcome after curative resection [35,36]. Thus it is suggested that extended lymphadenectomy should be performed in advanced gastric cancer [37]. Our multivariate analysis indicated that among six clinicopathologic variables (age, sex, location of tumor, tumor diameter, depth of invasion and differentiation), the depth of invasion was the most important factor influencing metastasis of lymph node. [38]

### Conclusion

This retrospective analysis of gastric cancer patients found that clinicopathological features of the disease differed with sex, tumour location, and tumour size. Lymph node metastasis is greatly affected by the extent of the primary tumor's invasion. Women with stomach cancer may have a less favourable prognosis than men. The possibility of lymph node metastases means that radical gastrectomy with lymphadenectomy should be considered for patients with any stage of gastric cancer, including EGC.

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