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Descriptive Epidemiological Study of Gastric Cancer Patients

Dr. Md. Mosharraf Hossain[1*], Dr. Tawhida Khandaker[2], Dr. Junaidur Rahman[3]

[1]Senior Consultant, Department of Surgery, Mugda Medical College Hospital, Dhaka, Bangladesh
[2]Medical Officer, Department of Surgery, Mugda Medical College Hospital, Dhaka, Bangladesh
[3]Assistant Professor, Department of Surgery, Mugda Medical College, Dhaka, Bangladesh

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***Corresponding author:** Dr. Md. Mosharraf Hossain
Senior Consultant, Department of Surgery, Mugda Medical College Hospital, Dhaka, Bangladesh

Abstract **Original Research Article**

Introduction: As per updated epidemiology of cancer stomach it ranks fourth after lung, breast and colorectal cancer. The overall prognosis is not very encouraging. The aim of the study was to evaluate the descriptive epidemiological study of gastric cancer patients. ***Methods:*** This prospective observational study was conducted at department of Surgical Oncology, National Institute of Cancer Research and Hospital, Mohakhali, Dhaka during July, 2019 to March, 2021. A total of 53 patients were included for the study. Sampling method was purposive non- randomized sampling. Preoperative evaluation included basic laboratory tests such as CBC, RBS, S. creatinine, S. electrolyte, S. albumin, liver function test, ECG, chest x-ray , USG of whole abdomen, contrast CT scan of abdomen and serum CEA. Statistical analysis was performed by using SPSS (statistical package for social sciences) version 28. Prior to the commencement of this study, the research protocol was approved by the Research Review Committee of Department of Surgical Oncology and the Ethical Committee of National Institute of Cancer Research & Hospital, Dhaka. ***Results:*** There was no association among postoperative complications of modified D2 gastrectomy with patient's age, gender and smoking status. The highest 49(92.45%) were experiencing anorexia, 43(81.13%) patients having vomiting and approximately 38(71.69%) patients had dyspepsia. 28(52.83%) were suffering from DM and 24(45.28%) patients were suffering from HTN. Out of 53 patients the highest number of patients 16 (30.19%) suffer from postoperative infection/sepsis. Total number of 7(13.20%), 15(28.30%), 21(39.62%), 3(5.66%) patients had N1, N2, N3a, N3b metastatic lymph nodes respectively. ***Conclusion:*** After analyzing the results of present study, it can be concluded that D2 gastrectomy with avoiding pancreatic splenectomy improves postoperative outcomes significantly.

Keywords: Epidemiology, Cancer, Gastrectomy, Surgery, Carcinoma.

INTRODUCTION

As per updated epidemiology of cancer stomach it ranks fourth after lung, breast and colorectal cancer. The overall prognosis is not very encouraging. However, surgery in the form of radical gastrectomy is the main treatment modality which offers a chance of long-term survival as well as hope for cure. So as obvious world literature is replete with discussions regarding the optimum extent of surgery [1]. According to a global estimation, approximately 9, 85,600 new cases of gastric cancer are being diagnosed in each year and 7, 38,000 patients die from this disease (10% of all cancer death) in world wide. As per Globocan data 2018 stomach cancer ranks seventh in Bangladesh. Surgery in the form of gastric resection was first carried out by Theodor Bill Roth in Vienna in 1881. Till now, gastric resections remain standard treatment for carcinoma stomach in the world. The overall survival rate of stomach cancer, patients using gastrectomy in Japan (50-60%) was higher compared with rest of the world (10- 30%) [2].This was mainly due to two factors one is active screening leading to early diagnosis and the other one is extensive lymphadenectomy along with gastric resection. It is known that the number of metastatic lymph nodes (LNs) is one of the most important prognostic factors for patients with gastric cancer. In the gastric cancer treatment, splenectomy was considered as a part of D2 lymphadenectomy, but addition of splenectomy often seen as a slightly increased risk factor for surgical complications that can be related to the resection of pancreatic tail [3]. Besides, another recent study clarified that more than one additional organ resection might increase the postoperative complications at significant level [4]. Especially for tumors situated in the proximal stomach, total gastrectomy (TG) and splenectomy was a standard procedure because of the high frequency of Lymph

Nodes (LN) metastasis to hilar nodes for proximal gastric tumors [5]. On the contrary, some researchers suggested that splenectomy could be a cause of additional morbidity and mortality and recent reports showed that splenectomy had no effect on survival for proximal gastric tumors [6]. Currently, preservation of the spleen is the accepted approach during total gastrectomy, and routine splenectomy is not recommended. Moreover, D2 gastrectomy is choice of procedure so far as pathological staging of the disease is concerned. This staging data is very important for planning of adjuvant treatment as cancer management has become multimodal nowadays. The average node retrieval is 15 in D1 gastrectomy, 27 in D2 gastrectomy and 43 in D3 gastrectomy. So NCCN 2010 has laid down the principle of examining at least 16 lymph nodes for proper pathological staging of stomach cancer, which has prognostic implication in stomach cancer. In modified D2 gastrectomy retrieves adequate no. of lymph nodes for proper staging with less extensive lymph node dissection with preserving spleen and pancreatic tail, so this procedure carries much lower postoperative morbidity and mortality.

METHODS

This prospective observational study was conducted at department of Surgical Oncology, National Institute of Cancer Research and Hospital, Mohakhali, Dhaka during July, 2019 to March, 2021. A total of 53 patients were included for the study according to following inclusion and exclusion criteria. Study population was patients with gastric cancer who underwent for modified D2 gastrectomy in the department of Surgical Oncology, NICRH, Mohakhali, and Dhaka. Sampling method was purposive non-randomized sampling. Preoperative evaluation included basic laboratory tests such as CBC, RBS, S. creatinine, S. electrolyte, S. albumin, liver function test, ECG, chest x-ray , USG of whole abdomen, contrast CT scan of abdomen and serum CEA. After proper staging evaluation patients were selected for operation. The surgery was carried out as per standard guideline. The modifications were done are as follows: 1. Modification of extent of lymph node dissection as per procedure, For distal gastrectomy-1,3,4sb,4d,5,6,7,8a,9,11p. 12a irrespective of T stage and for total gastrectomy- 1-7, 8a, 9, 11p, 12a (avoiding 11d &10 group of lymph node) as recommended by Japanese cancer association 2. Resection of pancreatic tail and spleen was avoided until unless they are directly involved by tumors. Outcome of surgery was measured by assessing postoperative complication for 30 days. Statistical analysis was performed by using SPSS (statistical package for social sciences) version 28. Prior to the commencement of this study, the research protocol was approved by the Research Review Committee of Department of Surgical Oncology and the Ethical Committee of National Institute of Cancer Research & Hospital, Dhaka.

- **Inclusion Criteria**
  - All biopsy proven &operable cases of adenocarcinoma of stomach.

- **Exclusion Criteria**
  - Patients with stage IV diseases.
  - Patients with previous gastric surgery.
  - Patients who unfit for surgery.
  - Patients unwillingly to take part in the study.

RESULTS

Table I shows that there was no association among postoperative complications of modified D2 gastrectomy with patient's age, gender and smoking status. Table II shows that there was no statistical association in gastric cancer with smoking to develop pulmonary infection. Table III shows that out of 53 patients the highest 49(92.45%) were experiencing anorexia, 43(81.13%) patients having vomiting and approximately 38(71.69%) patients had dyspepsia. Amon them 19(35.84%) were epigastria pain, 12(22.64%) were weight loss, 11(20.75%) were abdominal lump, 5(9.43%) were melena and 3(5.67%) were hematemesis. Table IV shows that out of 53 patients, the highest 28(52.83%) were suffering from DM and 24(45.28%) patients were suffering from HTN. Table V shows that out of 53 patients the highest number of patients 16 (30.19%) suffer from postoperative infection/sepsis. Subsequently, 8 (15.09%) patients had paralytic ileus for> 4 days. Besides, 8 (15.09%) patients suffered from postoperative pulmonary infection. 2 (3.77%) of each patient had the experience of duodenal blow out and wound dehiscence. Figure I shows that 10(18.87%), 19(35.85%), 12 (24, 64%) & 12 (24.64%) were pathological stage of IIA, IIB, IIIA, IIIB respectively. Table VI shows that among total number of 7(13.20%), 15(28.30%), 21(39.62%), 3(5.66%) patients had N1, N2, N3a, N3b metastatic lymph nodes respectively.

Table I: Association of different demographic parameters and postoperative complication in gastric cancer (n=53)

Parameters	**Complications**			
	no	minor	major	P value
Age				
<45	9(32.1%)	3(14.3%)	1(25.0)	0.356a
>45	19(67.9)	18(85.7)	3(75)	

Sex				
Male	21(75)	17(81)	3(75)	0.88b
Female	7(25)	4 (19)	1(25)	
Smoking				
Yes	18(64.3)	15(71.4)	3 (75)	0.827c
No	10(35.7)	6(28.6)	1(25)	

a.X^2= 2.068 df=2, b.X^2=.256 df=2 c.X^2=.380 df=2

Table II: Association of smoking and pulmonary infection in gastric cancer (n=53)

Smoking		Pulmonary infection	P value
	No	Yes	
	(n=4	(n=8)	
No	16	1	<0.412
Yes	29	7	

x2=1.657, df=1

Table III: Distribution of patients according to clinical presentation (n=53)

Clinical presentation	Frequency (%)
Anorexia	49(92.45%)
Dyspepsia	38(71.69%)
Vomiting	43(81.13%)
Epigastria pain	19(35.84%)
Abdominal lump	11(20.75%)
Hematemesis	3(5.67%)
Melena	5(9.43%)
Weight loss	12(22.64%)

Table IV: Distribution of patients according to co-morbidities (n=53)

Co-morbidities	Frequency (%)
Diabetes mellitus(DM)	17(32.07%)
Hypertension(HTN)	13(24.52%)
Both DM&HTN	11(20.75%)

Table V: Distribution of patients according to postoperative findings (n=53)

Postoperative findings	Frequency (%)
Postoperative wound infection	
Present	16. (30.19%)
Absent	37. (69.81%)
Wound dehiscence	
Present	2 (3.77%)
Absent	51 (96.23%)
Anastomotic leakage	
Present	2 (3.77%)
Absent	51 (96.23%)
Postoperative ileus (in days)	
>4	8 (15.09%)
≤4	45 (84.91%)
Duodenal blow out	
Present	2 (3.77%)
Absent	51 (96.23%)
Pulmonary infection	
Present	8 (15.09%)
Absent	45 (84.91%)

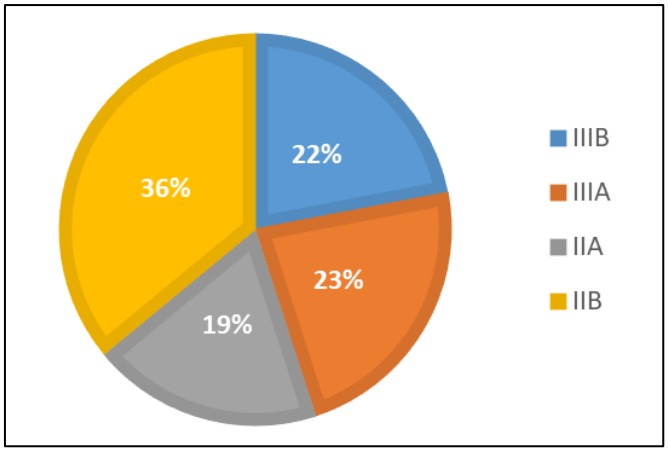

Figure I: Distribution of tumor profile according to pathological stage

Table VI: Distribution of patients according to Number of retrieved metastatic Lymph nodes (n=53)

Total number of metastatic lymph node	Total number of metastatic lymph node	Percentage%
N1(1-2)	7	7(13.20)
N2(3-6)	15	15(28.30)
N3a(7-15)	21	21(39.62)
N3b(>15)	3	3(5.66)

DISCUSSION

In this study, it was observed that mean (±SD) age was 48.9 ±9.36.The most common age group affected was 45-54(49%) years. Dr. Sahu *et al.,* [7] observed the mean ±SD was 49.10±8.32 which was closely resembled with this study. But according to the study by Galata *et al.,* [8] the mean age was 65 years which is higher with the comparison to the current study. In this present study it was observed that 41(77.35%) patients were males and 12 (22.64%) patients were females. The male to female ratio was 3:1. Lam *et al.,* [9] found in their study that male to female ratio was 2:1 which is closely resembled with this study. Similar observation regarding male predominant was also observed by Galata *et al.,* [8]. Majority of the patients were found smoker in this study 36(67.92%). Gastric cancer associated with smoking was found in similar with the study of Crumley *et al.,* [10]. But as the sample size is too small to comment on correlation between smoking and gastric cancer was difficult. No association was observed with smoking and postoperative complications. In this study most observed symptoms developed in patients were anorexia 49(92.45%), vomiting 43(81.13%), dyspepsia 38(71.69%), epigastric pain 19(35.84%), weight loss 12(22.64%) and abdominal lump 11(20.75%). Nafae *et al.,* [11] found almost similar clinical findings where most common observed symptoms were anorexia, dyspepsia, abdominal pain and weight loss. The most common comorbidity observed in this study was DM in 28(52.83%) patients and hypertension in 24(45.28%) patients which was similar to a previous Indian study by Dr. Sahu *et al.,* [7]. In this study shows that the patients of gastric cancer with DM were more prone to developed wound infection. Statistical association was observed in the patients with DM and postoperative wound infection. In this current study postoperative complications were categorized as major complications (Anastomotic leak and duodenal blow out) and minor complication's (wound infection, wound dehiscence, pulmonary infection and paralytic ileus). The prolonged post-operative ileus is one of the complication after gastric cancer surgery, which is lasted more than 4 days Liang, w. *et al.,* [12]. Post-operative ileus is usually lasted for 3 days following abdominal surgery. But considering our perspective and open surgery it had been arbitrarily raised and it was judged by the patient appreciates passage of flatus and bowel sound all together. In majority of cases the bowel activity returned well in time and 8(15.09%) of cases the post-operative ileus was longer than 4 days. Among those 8 patients, anastomotic leakage the major complication found in only 2(3.77%) of cases. Another major complication was duodenal blow out which had been developed in 2(3.77%) of patients. Rest of the 4 patients of post-operative ileus was found idiopathic. The complication in the form of wound infection was present in 16(30.19%) of cases. This is probably higher in comparison to Nafae *et al.,* [11] presented in his paper 13% wound infection was observed and there was a positive statistical significance with DM. Patients suffered from postoperative pulmonary infection was observed in 8(15.09%) of patients. Statistical analysis was performed to observe the association of pulmonary infection and smoking but no association was found. In this current study only 2(3.77%) patients developed wound dehiscence. Majority of the patients 29(54.71%) of this study did not developed any postoperative complication's. The mortality rate of this study was

only 1.08%. Similar findings were observed in the previous study of Nafae *et al.*, [11] and Sahu *et al.*, [7]. In this present study, shows that 10(18.87%), 19(35.85%), 12 (24, 64%) & 12 (24.64%) were pathological stage of IIA, IIB, IIIA, IIIB respectively. Almost similar findings 21% patients with stage IIB were obtained by Fujiwara *et al.*, [13]. Number of retrieved metastatic lymph nodes was found in 3.30%, 28.30%, 39.62%, and 3.66% of patients with N1, N2, N3a, and N3b respectively. Highest number of metastatic nodes were retrieved from N3 it was almost similar to the study by Fujiwara *et al.*, [13]. Statistical analysis was performed between tumor profile and postoperative complications but no association was observed.

CONCLUSION

After analyzing the results of present study, it can be concluded that D2 gastrectomy with avoiding pancreatic splenectomy improves postoperative outcomes significantly. With proper patient selection, improvement in surgical techniques and in an appropriate setting modified D2 gastrectomy is a safe option for the management of gastric cancer.

RECOMMENDATIONS

A similar study can be done with large sample size. Similar type of study can be done to observe long term survival.

FUNDING

No funding sources.

CONFLICT OF INTEREST

None declared.

ETHICAL APPROVAL

The study was approved by the Institutional Ethics Committee.

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