Original Research Article

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Management and outcomes of carcinoma stomach in Central India: a prospective cross-sectional study

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ABSTRACT

Background: Adenocarcinoma of the stomach is one of the leading causes of cancer-related deaths worldwide. Cancer rates in India are rising with increase in life expectancy and changes in lifestyles. Although the incidence of gastric cancer has decreased, number of newly diagnosed cases of proximal gastric and esophago-gastric junction adenocarcinomas has increased markedly. It is necessary to identify the population and risk factors along with malignancy characteristics in Central India.

Methods: A prospective observational study of 84 histopathological proven cases of gastric malignancy were analysed and evaluated. Treatment for the same was categorised after staging. Surgical resection, therapeutic and palliative chemotherapy was employed in the treatment protocols. A follow-up of 6 months was taken to observe the early complications.

Results: Eighty-four patients were analysed and evaluated. The mean age was 54.1 year with male predominance (1.54:1). Hypertension was commonest comorbidity, while smoking was commonest associated risk factor observed. Majority (56%) of patients underwent palliative chemotherapy while 34% underwent curative surgery. Subtotal gastrectomy with Billiroth II gastrojejunostomy was commonest performed operation (34%). Postoperative wound infection was commonest complication. Mean follow-up period of 11.3 months was observed where one patient expired of ARDS and one was readmitted for anastomotic site stricture.

Conclusions: There was high incidence of gastric malignancy patients presenting in stage IV in 5th decade of life with weight loss as main feature. Palliative chemotherapy is commonly followed because of advanced disease. The rates of inoperability are high and unfavourable histopathological variety occur frequently in older patients.

Keywords: Carcinoma stomach, Gastric malignancies, Gastrectomy, Adenocarcinoma of stomach, Antral malignancy, Palliative gastric surgery

INTRODUCTION

Adenocarcinoma of the stomach was the leading cause of cancer-related death worldwide through most of the 20th century. Cancer rates in India are rising with increasing migration of rural population to the cities, increase in life expectancy and changes in lifestyles.^{1,2} Diet in India encompasses diversity unknown to most other countries where very little is known about the role of the Indian diet

in causation or its role in prevention of cancer.^{3,4} Although the incidence of gastric cancer has decreased, the number of newly diagnosed cases of proximal gastric and esophago-gastric junction adenocarcinomas has increased markedly. These tumors are thought to be more aggressive than distal tumors and complex to treat.⁵ The only proven, potentially curative treatment for gastric cancer is surgical resection of all gross and microscopic disease. Even after that, disease recurs in both regional and/or distant sites in

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the majority of patients. Efforts to improve these poor results have focused on developing effective pre- and postoperative systemic and regional adjuvant therapies.

The aim of this study was to study the demographic profile of gastric malignancies, its clinical presentation and analyze various modalities employed for management of gastric malignancies along with its outcomes.

METHODS

To evaluate the management and outcomes of patients with gastric carcinoma, a prospective observational study was carried out at tertiary care and teaching Government Medical College and Hospital, Nagpur. The study period was from August 2016 to November 2018 (2 years 3 months)/27-months duration.

All patients admitted in surgical wards with histopathological confirmed case of gastric malignancy were sampled and included in the study. After examination and analysis patients diagnosed with primary gastric malignancy were admitted after obtaining their consent. Patients who were unfit for surgery, outside operated patients and non-consenting individuals were excluded from the study. The tissue for diagnosis was obtained by endoscopy or following surgical resection.

A pre-structured case record sheet was maintained comprising basic patient details, demographics, clinical history and examination, investigation, type of surgery, post-operative course, chemotherapy details and follow up schedule. Pre-operative evaluation was done with detailed history, clinical and radiological examination and metastatic workup requiring blood profiles, ultrasonography, contrast enhanced computed scan of abdomen and pelvis with oral and intravenous contrast, upper GI endoscopy guided biopsy. Patients were subjected to radical, palliative surgery or chemotherapy according to the staging of gastric malignancy. Follow up was done by regular visits with clinical assessment, upper GI Endoscopy as and when required and CT scan. Follow up was done every 6 months for first year and yearly for the next year.

Statistical analysis

The sample size for this study was determined after analyzing hospital database for gastric malignancies along with a reference study by Saha AK et al. An estimated sample size of 72 patients was calculated using the statistical formula. All the data was collected and tabulated. Descriptive statistics presented in tabular format with mean, standard deviation, percentage and others for descriptive statistical analysis. For analytical statistical calculations continuous variables were presented as Mean standard deviation. Continuous variables were compared using unpaired-T tests and two tailed p values were calculated. Categorical variables were expressed in actual numbers and percentages and were compared using Fisher

exact test and the two tailed p value was calculated. The p value of <0.05 was considered as statistical significance. Statistical analysis was done using free trial version of Graph Pad Prism 6® for Windows version 6.07 (trail) during the 30-days demo interval.

RESULTS

In present study total 84 cases of gastric malignancies were admitted of various age groups during this study period. The results of the study are as shown: the youngest patient reported was 27-years-old male and oldest was 88-years-old male patient with gastric malignancy. Maximum number of patients 26 (30.9%) were found to 41-50 years age group. On analyzing the data there were 51 (60.7%) male patients and 33 (39.3%) female patients. The male: female ratio was 1.54:1. Maximum number of patients were seen in 41-50 years age group 26 (30.9%), males were 18 and females were 8 (Table 1).

Table 1: Age and gender distribution.

Age (years)	No. of patients	Gender distribution (n=84)	
(years)	(n=84) (%)	Male	Female
21-30	4 (4.8)	2	2
31-40	7 (8.3)	2	5
41-50	26 (30.9)	18	8
51-60	23 (27.4)	12	11
61-70	18 (21.4)	13	5
71-80	4 (4.7)	2	2
81-90	2 (2.38)	2	0
Total	84 (100%)	51 (60.71%)	33 (39.28%)

Another important factor to consider was presence of comorbidities in the patient. The data showed 43% patients had some associated co morbidities. Remaining 57% did not have any comorbidity at the time of presentation. The most common comorbidity was hypertension. (22.6%) (Table 2). The performance status scales were analysed using ECOG scale (Eastern Cooperative Oncology Group). Majority of the patients (57%) belonged to ECOG-3 while the mean value of 2.7 on ECOG scale was obtained after calculation.

Table 2: Comorbid condition.

Comorbidity	No. of patients (n=84)	Percentage (%)
COPD	5	5.9
DM	7	8.33
HTN+ DM	3	3.7
HTN	19	22.6
COPD+HTN	2	2.3
No comorbidity	48	57.1

The site of gastric malignancy is useful for operative perspective. In our study the commonest site of occurrence of gastric malignancy was found in antrum (67%), pylorus

(67%) followed by body of stomach (18%). The ulceroproliferative type of growth pattern was most commonly seen (30%) followed by polypoidal growth (27%) (Table 3).

Table 3: Anatomical site of involvement and type of lesion.

Variables	No. of patients (n=84)	Percentage (%)
Sites of malignancy		
Gastroesophageal junction	14	16
Cardia	7	8
Lesser curvature	16	19
Greater curvature	12	14
Fundus	16	19
Body	18	21
Antrum	57	67
Pylorus	57	67
Whole stomach	9	10
First part of duodenum	1	1
Type of lesions		
Polypoidal	23	27.3
Ulcero-proliferative	26	30.9
Ulcerative lesion	12	14.2
Infiltrative ulceration	18	21.4
Diffuse infiltration	5	6.2

Present study showed that weight loss (88%) was commonest symptom followed by loss of appetite (86%) and weakness (67.8%). Pain in abdomen was seen in 63%, while nausea/vomiting in 44%.

A palpable lump in abdomen was seen in only 20% of individuals. The risk factors when analysed showed majority of the patients were exposed to smoking and tobacco chewing. Around 39.2% patients consumed alcohol regularly (Table 4). In the present study maximum number of patients (39) were diagnosed with stage IV disease (46%) followed by stage III b in 17.8%. Advanced disease stage III and IV was seen in 64 (76.1%) patients (Table 5).

Table 4: Clinical features and risk factors.

Variables	Total no. of patients (n=84)	Percentage (%)
Symptoms		
Hematemesis	16	19
Vomiting	37	44
Melena	20	23.8
Lump in abdomen	17	20
Pain in abdomen	53	63.09
Early satiety	41	48.8
Loss of weight	74	88
Loss of appetite	73	86
Weakness	57	67.8
Jaundice	8	9.5
Risk factors		
Alcohol	36	42.8
Tobacco chewing	33	39.2
Smoking	47	55.9

Table 5: Observed staging of gastric cancer.

Staging	No. of patients (n=84)	Percentage (%)
Ia	1	1.2
Ib	2	2.3
IIa	4	4.8
IIb	13	15.5
IIIa	5	5.9
IIIb	15	17.8
IIIc	5	5.9
IV	39	46.6

In present study, 41 (48.8%) patients underwent surgical procedure of which 32 were radical resections and palliative procedure in 9 patients. Of the radical surgeries, distal gastrectomy in 16 (50%), followed by subtotal gastrectomy in 11 (34.7%) patients. Palliative procedures in the form of ante colic isoperistaltic gastrojejunostomy with or without jejuno-jejunostomy was done. The other non-operable 53 (63.09%) patients underwent palliative chemotherapy. None of the patient was given neoadjuvant chemotherapy.

Table 6: Different types of curative surgeries.

Type of curative surgery	No. of patients (n=32)	Percentage (%)
Partial gastrectomy with Billiroth-II gastrojejunostomy	2	6.2
Distal gastrectomy with Billiroth-II gastrojejunostomy	16	50
Subtotal gastrectomy with Billiroth-II gastrojejunostomy	11	34.3
Total gastrectomy with Roux-en-y eso-jejunostomy	3	9.5

In the present study signet ring cell adenocarcinoma was the commonest histological subtype (58.3%) followed by papillary adenocarcinoma (9.2%).

In present study, poorly differentiated (25%) type of gastric malignancy was found to be the commonest type of

variety, while undifferentiated type (2.3%) was the least observed one (Table 7).

The most common postoperative early complication was wound infection (7.1%) and late complication was found to be anastomotic site stricture (1.2%). In the present study

31 patients underwent adjuvant chemotherapy in the operable group with remaining 53 were subjected to palliative chemotherapy. In the study none patients have

received neoadjuvant chemotherapy. One patient expired due to ARDS and succumbed on postoperative day five.

Table 7: Histopathology types and grades of gastric malignancy.

Variables	Total no. of patients (n=84)	Percentage (%)
Histopathology report		
Tubular adenocarcinoma	7	8.6
Signet adenocarcinoma	49	58.3
Pseudo signet adenocarcinoma	4	4.7
Squamous cell carcinoma	4	4.7
Dysplastic type	3	3.5
GIST	2	2.3
Diffuse B large cell NHL	2	2.3
Papillary adenocarcinoma	8	9.7
Mucinous adenocarcinoma	5	5.9
Grade		
Well differentiated	3	7.3
Moderately differentiated	15	36.5
Poorly differentiated	21	51.4
Undifferentiated	2	4.8

Table 8: Different postoperative complications (early and late).

Post-operative complications	No. of patient (n=84)	Percentage (%)
Early		
Mortality	1	1.2
Haemorrhage	3	3.5
Delayed gastric emptying	0	-
Wound infection	6	7.1
Dehiscence	0	-
Pulmonary atelectasis	2	2.3
Ruptured duodenal stump	0	-
Sub phrenic abscess	0	-
Transient jaundice	0	-
Late		
Dumping syndrome	0	-
Afferent loop	0	-
Efferent loop	0	-
Recurrence	0	-
Anastomotic stricture	1	1.2

DISCUSSION

Stomach cancer is the second most common cancer among men and third most among female in Asia and worldwide. The symptoms of gastric malignancy are often reported late when the disease is already in advanced stages and 5-years survival is less than 30% in developed countries and around 20% in developing countries.^{6,7} Incidence of gastric malignancies maximum in between 41-50 years. Our study had only one patient below 30 years of age (27 years), while mean age of the patients was 54.1 with range being 25 to 90 years. The findings are similar to studies by Ghirmire et al and Ghosh et al.^{8,9} The study also showed male predominance. Males were more commonly affected than females in a ratio of 1.5:1. Analysing the literature further we conclude that the incident of gastric cancer was

found to be 1.5-2 times more frequent in males than females. This could be due to differences in lifestyle, including drinking, smoking, or increased stress levels in men, which have been linked to the early development of gastric cancer. ¹⁰

On observing the various risk factors for gastric cancer, majority of the patients in our study were exposed to smoking tobacco with 57% of smokers. Chewing tobacco was observed in 39% of them whereas 42% consumed alcohol regularly. Consumption of carcinogenic agents like tobacco and alcohols are known to cause cancers.^{11,12}

Loss of appetite and weight loss for 6-9 months before diagnosis was the commonest presenting complain pertaining to gastric malignancy. Ghirmire et al and Ghosh et al also in their respective studies mentioned similar findings. We believe, early gastric cancer often causes no symptoms or only nonspecific symptoms like dyspepsia. Symptoms of advanced carcinoma include abdominal pain that is often persistent and unrelieved by eating. Ulcerated tumours may cause bleeding and hematemesis, and tumours that obstruct the gastric outlet may cause vomiting. Systemic symptoms such as anorexia and weight loss suggest disseminated disease. The lack of early symptoms often delays the diagnosis of gastric cancer.

Performance status is the most important parameter for predicting survival in patients with metastatic gastric cancer. The ECOG performance status was assessed and a mean value of 2.7 on ECOG scale was obtained after calculation. Our findings were correlating with a study by Assi et al. We believed that patients with good performance status were better able to tolerate chemotherapy and/or surgery, and usually had a relatively good survival outcome.

Pylorus, followed by antrum was most common site of involvement followed by body and fundus. The most common gross appearance was ulcer proliferative growth (about 30%), followed by polypoidal growth which constituted the second most common type (27%). Many recent studies now showed a trend towards proximal involvement of stomach malignancies. Similar findings were reported by Saha et al and Ghosh et al. ¹³

Staging is one of the important prognostic criteria for management of gastric malignancies. We observed stage IV, (advanced stage) as the most common stage of presentation. Liver (60%) was the commonest site of metastasis, followed by peritoneum (56%) in our study. Mostly patients came tertiary health care centre with advanced stage of gastric malignancy with secondary metastasis to liver, peritoneum, bone, lungs as a last resort.

Gastrostomies with nodal dissection is the standard of treatment for gastric cancer. The preferred surgery for gastric malignancies is subtotal gastrectomy in antral cancers and total or proximal gastrectomy in cancer of fundus or body. At least 4 cm tumor-free resection margin is needed for the adequacy of the surgery. Patients are considered surgically unresectable if there is evidence of metastasis or loco regional spread involving the peritoneum or encasement of major vessels. There is no role of debulking surgery in gastric cancer. There is a considerable controversy regarding the role and extent of lymphadenectomy in gastric cancer. D2 dissection is widely practiced in far eastern countries like Japan and Korea. European and American data shows D1 lymphadenectomy is equal to D2 lymphadenectomy in terms of overall survival with lesser morbidities.

In patients presenting with gastric outlet obstruction a palliative bypass, anterior gastro jejunostomy is done to palliate the symptoms. If the bypass is not feasible due to extensive involvement, a feeding jejunostomy is done to maintain the nutrition of the patient. In case of gastric outlet obstruction with poor general condition, who is not fit for any surgical procedure, an endoscopic stenting can be attempted.¹⁴⁻¹⁶ In present study surgery with curative intent has been performed in 32 patients and palliative surgery in 9 patients. None of them underwent endoscopic stenting.

Significant proportion of Indian patients present with unresectable or advanced lesions. These patients had incurable disease and the role of chemotherapy in them is purely palliative. Chemotherapy is gaining momentum in the management of gastric cancers. It is known that gastric cancers tend to metastasize early in the course of the disease.

In our study, patients (1.2%) had anastomosis related complication and wound infection in patients (3.4%). Fabio et al had seen similar results to our study. 17 Our patients had wound infection and anastomosis related complications. We believed nutrition was the main culprit behind it. Most of the complications related to surgeries for gastric malignancies were related with malnutrition. Patients with advanced disease have poor albumin levels which hampers anastomotic healing. They are divided into groups: postoperative three distinct immediate complications, which occur within 30 days of surgerysecondary to anesthetic, surgical, early postoperative complications- considered until six months after surgery, due to factors related to surgery and late complications, which occur six months after surgery, but still related to it. 18-20 The immediate postoperative complications overall are the most common respiratory illnesses, including atelectasis between 12 and 20%, pneumonia by about 9%, respiratory failure in an average of 3% and pulmonary embolism 0.05%. Among the local complications are cited in the eviscerations about 4% and abscess and wound infection totalling about 3%. Other less frequent complications are referred to venous thrombosis of lower limbs in 2%, 1% in sub phrenic abscess and acute pancreatitis in 1% of cases^{21, 22, 23, 24}

In general, Adenocarcinoma of the stomach comprises over 95.4% of all gastric cancers. Other gastric malignancies like GIST, lymphomas are relatively rare. Adenocarcinoma was the commonest diagnosis (93.5%) in this study, and only two cases of Non-Hodgkin's Lymphoma (NHL) and GIST each. No other type of gastric malignancies was found in our study. Most of the cancers were poorly differentiated (49%), followed by moderately differentiated (33%), and well differentiated types (11%). Similar, findings were seen in studies by Sharma et al and Alsir et al.^{25,26}

In present study, mean follow up period was 11.3 months. Our study evaluated the outcomes in terms of discharge, death and readmission. Out of 84 patients, 83 patients were discharged. One patient died on post-operative day 5 due to acute respiratory distress syndrome. One patient was readmitted after 4 months with features of anastomotic site

stricture which was managed with endoscopic balloon dilatation. Very selective patients undergo curative surgery, this happens because of the fact that majority of the patients come to hospital in very advanced & inoperable stage, when none of the therapy is feasible. Hence, they land up with palliative surgery and chemotherapy or palliative chemotherapy alone.

CONCLUSION

There is high incidence of gastric malignancy patients presenting in stage IV in 5th decade of life with weight loss as the main feature, in which palliative chemotherapy being the treatment followed. The rates of inoperability are high and unfavourable histopathological variety occur frequently in older patients. Long term survival characteristics could not be calculated because of the short duration of study.

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Institutional Ethics Committee

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