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Original Research Article

A five-year retrospective analysis of clinical, pathological and treatment aspects on stomach cancer from a regional cancer centre in north east India

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ABSTRACT

Background: Stomach cancer is the fifth most common cancer in the world, which generally presents in advanced stage and have poor prognosis.
Methods: Retrospective study including 101 cases was done at the Regional Cancer Centre in North East India from January, 2018 to December, 2022 on the clinical, pathological and treatment aspects of stomach cancer.
Results: Median age of diagnosis was 59 years, with high male: female ratio. Most common risk factor was tobacco smoking and chewing. Most common symptom was pain abdomen followed by nausea or vomiting. Antrum was the most common tumor location, and gastric outlet obstruction was present in 10.9% patients. Histologically, all patients had adenocarcinoma, with metastasis found in 47 patients. Out of the 101 patients enrolled in the study, 50 patients were treated with curative intent and the remaining 51 patients were treated with palliative intent. Patients were treated with surgery, preoperative/ adjuvant/ palliative chemotherapy and/or curative/ palliative radiotherapy.
Conclusions: This study showed tobacco use as an important risk factor for stomach cancer. Majority of our patients were diagnosed at an advanced stage, thus having poor prognosis. Hence, avoidance of risk factors, early detection of signs and symptoms, and aggressive treatment with surgery, chemotherapy, and/ or radiotherapy is required for management of stomach cancer.

Keywords: Antrum, Gastric outlet obstruction, Metastasis, Palliative, Stomach cancer

INTRODUCTION

The stomach begins at the gastroesophageal (GE) junction and ends at the pylorus. It is divided into four parts: gastric cardia, fundus, body and pyloric canal. Stomach cancer (SC) is the fifth most common cancer in the world and the third leading cause of cancer related deaths.[1] It is one of the most common gastrointestinal malignancies in China, with around 4,00,000 new cases per year.[2] It is the seventh most prevalent cancer in the world.[3]

It accounts for 8% of the total cancer cases and 10% of total deaths due to cancer.[4] There is a significant global variation in the incidence of stomach cancer, with the highest rates seen in Eastern Asia, Eastern Europe and South America, and lowest incidence in North America and parts of Africa.[4] Stomach cancer is generally diagnosed at an advanced stage. Risk factors associated with Stomach cancer includes male gender, *H. pylori* infection, alcohol use, tobacco smoking, obesity, dietary habit, and family history of cancer.[5]

Treatment includes multimodality approach including surgery, chemotherapy, and/or radiation therapy. Chemotherapy can be given in adjuvant setting or in neoadjuvant setting to surgery. Surgery is the treatment of choice for early stage and locally advanced stomach cancer, with chemotherapy being the standard for patients with metastatic disease. The primary aim of our study is to understand the epidemiology, clinical, pathological and treatment aspects of the disease; so as to help in prevention, early detection, and effective treatment options to improve the survival; and the secondary aim is to corelate it with any similar studies done in the past as it is one of the first study being done in North East India.

METHODS

A retrospective study was conducted at the Regional Cancer Centre, Regional Institute of Medical Sciences (RIMS) in North East India. The study included all histopathologically confirmed cases of stomach cancer treated at our center from January, 2018 to December, 2022. The data was collected from the departmental cancer register and patients' treatment file. All the patients were diagnosed on the basis of clinical, imaging, endoscopic and histopathological (HPE) examination. The total sample size was 101 patients.

Patients diagnosed with gastro intestinal stromal tumor (GIST), gastric lymphoma or gastric melanoma were excluded from the study. Only patients with proven HPE of gastric adenocarcinoma were included in the study. The data collected includes age, sex, religion, co-morbidities, dietary habits, family history of cancer, chief complaints, TNM staging, primary site of disease in the stomach and treatment received. IBM SPSS statistics version 21 for windows is used for data analysis along with Chi-square test.

RESULTS

Epidemiological data

A total of 101 patients were included in the study with male: female ratio being 1.89:1.0, showing high male predominance. The median age of diagnosis was 59 years, with age distribution ranging from 22 years to 68 years. Most patients belonged to the age group of 51 to 60 years of age (31.7%) (Figure 1). Most patients included in our study were Christians (54.5%), followed by Hindus (33.7%) and Muslims (11.9%).

Height and weight of the patients ranged from 136 cm to 177 cm and 27 kg to 74 kg respectively, with the mean weight being 50.6 kg. Body Surface Area (BSA) ranged from 1.0 to 1.9 m^2, with the average BSA being 1.46 m^2. Body Mass Index (BMI) ranged from 14.60 kg/m^2 to 25.61 kg/m^2, with the average BMI being 22.67 kg/m^2.

Toxic food habits included tobacco smoking in 48 patients (47.5%), tobacco chewing in 29 patients (28.7%), betel nut chewing in 29 patients (28.7%) and alcohol consumption in 38 patients (37.6%). Patients consuming both alcohol and tobacco smoking or chewing were 33 (32.7%) in number. Patients had co-morbid conditions which included type 2 diabetes mellitus (9.9%), pulmonary tuberculosis (7.9%), systemic hypertension (5.9%) and asthma (3.0%). History of cancer in first degree relatives was present in only 11 patients, out of 101 patients; with family history of stomach cancer being present in only 3 patients. No case of infection with *Helicobacter pylori* was detected before the diagnosis.

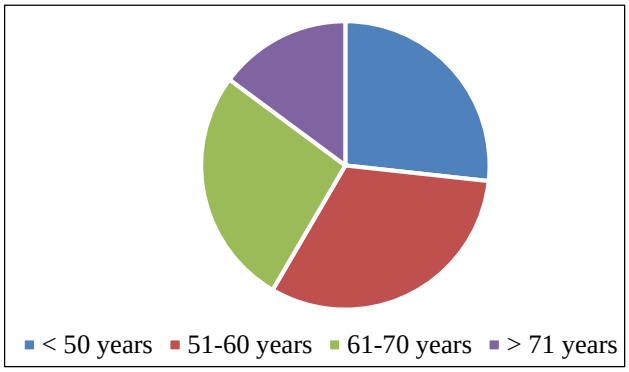

Figure 1: Pie chart showing the age distribution of the study population.

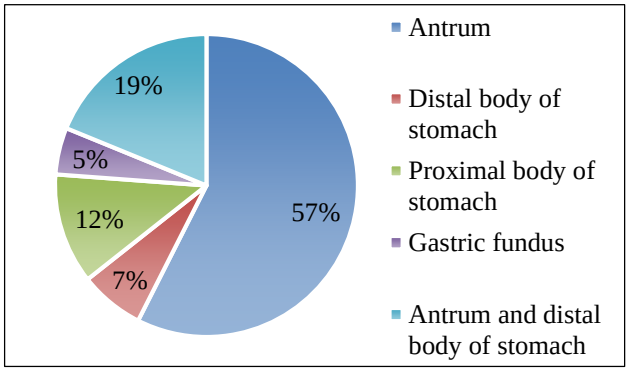

Figure 2: Pie chart showing the sub-sites of tumour location in stomach.

Clinico-pathological data

Common clinical symptom at the time of presentation was pain abdomen (76.2%), nausea or vomiting (47.5%), weight loss and decreased appetite (36.6%), abdominal distention (23.8%), melena (11.9%) and features suggestive of Gastric outlet obstruction (10.9%). Most patients had two or three symptoms at the time of diagnosis with the most common symptom combination being pain abdomen, nausea or vomiting, and abdominal distention. The average duration between the appearance of first symptom and consultation was 4.9 months, with majority of patients consulting after 1 month.

Most common topographic or sub-site of tumour location was antrum (57.4%), followed by both antrum and distal body of stomach (18.8%), proximal body of stomach (11.8%), distal body of stomach (6.9%), and fundus (5.0%) (Figure 2). All the patients included in the study had gastric adenocarcinoma, with most common histological grade being moderately differentiated adenocarcinoma (53.7%).

Staging

The stage of the disease was assessed on the basis of clinical examination, Contrast Enhanced Computed tomography (CECT scan) of thorax, abdomen and pelvis; and operative findings. Among the T stage, the most common stage was T3 (49.5%), followed by T2 (31.7%) and T4 (17.8%) respectively. Majority of the patients had nodal involvement (84.2%).

47 patients had distant metastasis at the time of presentation, with the most common site being liver, followed by omentum, supraclavicular lymph nodes and bones. The patients were staged on the basis of American Joint Committee on Cancer (AJCC 8th edition) staging system and the most common stage was 4B (46.5%), followed by 2A (20.8%) and 3 (19.8%) (Figure 3).

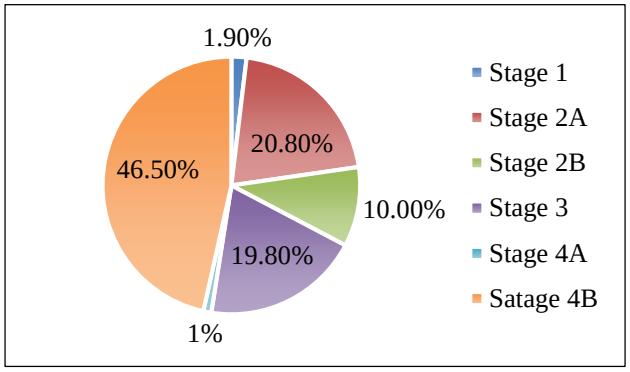

Figure 3: Pie chart showing the distribution of patients according to Stage.

Treatment

With respect to the treatment received, out of 101 patients, 50 patients were treated with curative intent and 51 patients with palliative intent. Patients were treated with surgery, chemotherapy, radiation therapy and/or supportive care. The surgical procedures performed on the patients included total gastrectomy, subtotal gastrectomy, partial gastrectomy, distal gastrectomy and feeding jejunostomy.

Total 29 patients underwent curative surgery, while as 13 patients were treated with palliative surgery. Among chemotherapy, 25 patients underwent neo-adjuvant or pre-operative chemotherapy. 23 patients were treated with adjuvant chemotherapy and 31 patients with palliative chemotherapy. Most common chemotherapy used in the adjuvant and palliative setting included DCF regimen (injection docetaxel on day 1, injection cisplatin on day 1 and injection 5-FU from day 1 to day 5) or CAPOX regimen (injection oxaliplatin on day 1 and tablet capecitabine from day 1 to day 14), followed by cisplatin + 5-FU regimen.

Total 26 patients were treated with definitive curative radiation therapy. External Beam Radiation Therapy (EBRT) was given to the tumour bed along with the draining regional lymphatics by cobalt-60 teletherapy machine, at a Source to Skin Distance (SSD) of 80 cm, to a total tumour dose of 50 Gy in 25#, 5 days a week, for 5 weeks by two parallel opposed AP/PA fields, in supine position. 11 patients received palliative radiation therapy to the bones (8.9%) and haemostatic (2.0%). Of the 101 patients, irrespective of treatment intent, supportive care was given to 55 patients.

DISCUSSION

The incidence of stomach cancer shows considerable geographic variation with highest incidence in South-East Asia.[4] Its aetiology is multifactorial. In many case-control and cohort studies, tobacco smoking has been attributed as an important and independent risk factor for stomach cancer.[6]

Diets rich in fresh fruits, and raw vegetables are associated with decreased risk.[7] Infection with *H. pylori* is believed to be the most important risk factor associated with stomach cancer.[8] No case of *H. pylori* infection was detected before the diagnosis of stomach cancer. In India, people consume dried salted fish; along with fermented, smoked, pickled meat; which is responsible for increased incidence of stomach cancer.

In our study the male: female ratio is 1.89:1 and the median age of our patients was 59 years. These findings were similar to the study conducted by Tuyns et al, stomach cancer rarely occurs before 40 years of age.[9] Most common presenting symptom in our study was abdominal pain (76.2%) followed by nausea or vomiting (47.5%), with features suggestive of Gastric outlet obstruction seen in 10.9% patients, which was similar to the study conducted by Barad et al.[10] In our study, locally advanced and metastatic stage of stomach cancer, stage 3 and 4, was found in 29.7% and 47.5% patients respectively. Stomach cancers are generally diagnosed in symptomatic patients with advanced stage.

Confirmatory diagnosis of stomach cancer is based on upper gastro-intestinal endoscopy associated (UGIE) with biopsy.[11] In our study, UGIE with biopsy was done for all the patients along with imaging for initial staging. Most common tumour sub-site was antrum, followed by body of the stomach, which is similar to the study conducted by Cherian et al.[12]

In our study, 47 patients had distant metastasis; with liver being the most common site of metastasis followed by omentum, which is similar to a European study.[13] Out of the 101 patients, 50 patients were treated with curative intent and 51 with palliative intent, in our study. The most common surgery being distal or subtotal gastrectomy (antrectomy) with Billroth 1 or 2 anastomosis in our study, with feeding jejunostomy being done in 13 patients.

Total 26 patients were treated with curative radiation therapy after surgery. Adjuvant chemotherapy after surgery and radiation therapy was given to 9 patients (6 patients received CAPOX regimen, and 3 patients received DCF regimen) out of these 26 patients due to the presence of residual disease on imaging on follow up. This treatment schedule was similar to a study conducted by Macdonald et al.[14]

The standard treatment of choice for patients with early stage or locally advanced stomach adenocarcinoma is surgery, followed by adjuvant radio-chemotherapy. Radiotherapy and chemotherapy improve the loco-regional control and overall survival. For patients with metastatic disease, the standard of care being chemotherapy and supportive care, with radiation therapy being used only in palliative setting. Due to the advancement of technologies, artificial intelligence can also be used to establish predictive models for evaluating treatment response, metastasis and prognosis.[15] Peritoneum being the most common site of metastasis or recurrence is also being considered as a good target for novel therapeutic approaches.[16]

The limitations of our study are small sample size, and poor follow-up due to which patient survival couldn't be properly assessed. Further studies have to be conducted to assess the treatment response and outcome of patients with stomach cancer.

CONCLUSION

Stomach cancer is the 5th most common cancer in the world, with high incidence in South-east Asia. Most common risk factor is tobacco smoking and alcohol consumption, with a high incidence rate of stomach cancer being in males. The most common symptom being pain abdomen and nausea or vomiting. In our study, only gastric adenocarcinoma was included with the most common site being gastric antrum. Patients were treated with multimodality approach which included surgery, chemotherapy, radiation therapy and supportive care.

Avoidance of risk factors, early detection of signs and symptoms; and endoscopy are important for early detection of stomach cancer. This study is aimed at highlighting the epidemiology, clinico-pathological and multi-modality treatment options available in the management of stomach cancer. It is one of the first studies on stomach cancer being conducted in North East India and it correlates with similar studies done in other parts of the world.

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