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Original Research Article

A retrospective study of the epidemiology of esophageal cancer and its management in a Central Indian Institute

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ABSTRACT

Background: The aim of the study was to better understand the epidemiology of esophageal cancer and its management in Indian patients.
Methods: This was a retrospective study conducted in a Central Indian institute in which 42 patients of esophageal cancer admitted during a 2 year period were evaluated and treated. All underwent upper gastrointestinal (GI) endoscopy and computed tomography (CT) scan to assess site and extent of tumor.
Results: There were a total of 42 patients in the study of which the mean age group was 50-65 years with the disease occurring more commonly in males (65%). The male -female ratio was 1.8:1. The most common histological type was squamous cell carcinoma with 32 patients (76.2%) followed by adenocarcinoma with 10 patients (23.8%). The most common site of the esophagus involved was the lower third and gastro-esophageal junction in 23 patients (54.76%) followed by mid esophagus in 14 patients (33.3%). Most patients were inoperable as the most common stage of presentation was IV in 18 patients. Esophagectomy was possible in 8 patients while 26 underwent feeding jejunostomy and 8 underwent esophageal stenting before being sent for chemoradiation. The 1 year survival rate in this study was 16.6%.
Conclusions: Cancer esophagus is still a disease that presents late for treatment in India with majority of patients managed with palliative interventions followed by chemoradiation. The survival rate is poor. Squamous cell carcinoma is far more common with adenocarcinoma showing increasing trends, both occurring more commonly in the lower esophagus.

Keywords: Esophageal cancer, Esophagus, Jejunostomy, Gastroesophageal junction

INTRODUCTION

Esophageal cancer is the eight most common cancers worldwide and the sixth most common cause of cancer related deaths.[1] Approximately 480,000 cases occur worldwide annually.[2] Among the malignancies of the gastrointestinal (GI), esophageal cancer accounts for 3.2% of all the newly diagnosed cancer patients in the world, which is behind colorectal (10.2%) and stomach (5.7%) cancer.[3] In India, as per World Health Organization (WHO), Globocon 2018, esophageal cancer is the 6th most common cancer with incidence of 5.04%. As per the population-based cancer registry (PBCR) of India (National Center for Disease Informatics and Research, National Cancer Registry Programme, Indian Council of Medical Research), the age-adjusted rate of esophageal cancer was highest in east Khasi Hill district of Meghalaya followed by Aizawl in Mizoram, irrespective of gender, for the latest period of 2012–2014.[4]

The most common form of esophageal cancer worldwide is squamous cell carcinoma (SCC). About 90% of the esophageal carcinoma in the residents of Asia, Africa, and Eastern European countries is SCC.[5] Adenocarcinoma is becoming the most common

histological type in the western world.[6] Esophageal cancer is a disease of advanced age, peaking in the seventh and eighth decades of life. Survival for patients with oesophageal carcinoma is poor. Major challenge is the late presentation of the patients as well as local recurrence at the primary site after resection. Despite newer treatment modalities, survival remains poor for patients with oesophageal carcinoma and additional treatment-related toxicity can be devastating. Selecting appropriate patients for different treatment modalities are thus crucial, as well as the identification of predictive factors for response to therapy. This study presents a review of 42 patients of esophageal cancer managed at a Central Indian institute during a 2 year period from 2018-2020 with the aim of understanding the epidemiology of the disease.

METHODS

This is an observational prospective study which was conducted at the Gandhi Medical College and associated Hamidia Hospital, Bhopal, Madhya Pradesh, India after taking the necessary ethical approval from the ethical committee of the hospital (letter no 3612729/MC/IEC/2018). The duration of the study was a period of 2 years starting from December 2018 to December 2020. The sample size of the study was 42 patients. The sample size was calculated using an online sample size calculator. The confidence level was taken to be 75%, population size 1000 and margin of error was 10%. The inclusion criteria were all patients of esophageal cancer that were admitted in the department of surgery and those admitted in the department of radiotherapy for chemo-radiation during the period of study. Data from all the patients of cancer esophagus was collected and filled in preformed proformas. Esophagoscopy was performed in all patients to assess the site, luminal patency and to extract a biopsy to confirm histological diagnosis. Contrast enhanced computed tomography (CT) scan of the chest and abdomen was done in all cases to see the size and extent of the growth and assess nodal status and local invasion status. All the information collected was used to determine the stage and operability. Patients found to be operable were taken for curative surgery mostly by Ivor Lewis esophagectomy and then referred for post-operative radiotherapy once stable. The patients that has advanced inoperable disease or distant metastases underwent palliative procedures such as esophageal stent placement or feeding jejunostomy and were then referred for palliative chemo-radiation. The patients were followed up for 1 year after discharge.

Statistical analysis

The collected data were transformed into variables, coded and entered in Microsoft excel. Data were analyzed and statistically evaluated using statistical package for the social sciences (SPSS)-PC-21 version. Quantitative data was expressed in mean±standard deviation or median with interquartile range and depends on normality distribution difference between two comparable groups were tested by Mann Whitney 'U' test. Qualitative data were expressed in percentage. Statistical differences between the proportions were tested by chi square test or Fisher's exact test.

RESULTS

Among the total sample of 42 patients that were included in the study it was observed that only 8 were below 50 years of age and 9 were above 65 years of age (Table 1). Majority of the patients were in the age group of 51-65 years of age constituting 59.5% of the sample size. In our study the disease was seen to occur more commonly among males accounting for 64.28% (27) of the sample size (Table 2).

Table 1: Age wise distribution of esophageal cancer study subjects (n=42).

Age group (years)	N	%
Up to 50	8	19.04
51-65	25	59.5
>65	9	21.4

Table 2: Gender wise distribution of esophageal cancer study subjects (n=42).

Gender	N	%
Male	27	64.2
Female	15	35.7

The youngest case diagnosed in our study was a 35 year old male with more males (4) diagnosed less than 50 years of age than females. The most commonly involved part of the esophagus was the lower third and gastro-esophageal junction (GEJ) in 23 patients comprising more than half of the sample size (Table 3). Most of the patients in our study at the time of presentation had advanced inoperable disease (Table 4).

Table 3: Site of esophageal cancer in study subjects (n=42).

Site of oesophagus	N	%
Lower third	15	35.7
Middle third	14	33.3
Upper third	5	11.9
GEJ	8	19

Table 4: Operability status of esophageal cancer study subjects (n=42).

Operability	N	%
Inoperable	34	80.9
Operable	8	19.1

80% of the patients were inoperable at presentation while only 19% (8) had resectable growth without distant metastases. The 8 operable patients underwent curative Ivor Lewis esophagectomy while the rest 34 underwent a palliative intervention followed by chemo-radiation. Feeding jejunostomy was the most commonly done palliative procedure in this study done in 26 patients. It was typically done for patients with complete luminal obstruction by the growth. 8 patients who had partial luminal obstruction with inoperable disease underwent esophagoscopy guided esophageal stenting using self-expanding metallic stents (Table 5).

Table 5: Type of treatment modality in esophageal cancer study subjects (n=42).

Type of treatment modality	N
Feeding jejunostomy	26
Ivor-Lewis surgery	8
Esophageal stenting	8

In this study, it was observed that there was a clear predominance of squamous cell esophageal cancer. Three quarters (76%) of the patients had squamous cell cancer while only 10 (23.8%) patients had adenocarcinoma (Table 6). Of the 10 patients with adenocarcinoma, 9 had involvement of the lower esophagus and GEJ.

Most of the patients presented to the hospital with advanced disease and severe dysphagia. 18 patients had stage 4 disease while 14 had stage 3C. Most of these patients underwent palliative interventions and chemo-radiation. 5 patients with stage 3A and 3 of the 5 patients with stage 3B disease were considered for curative esophagectomy.

Only 7 patients survived the follow up period of 1 year. Majority of the patients died during the follow up period due to sequelae caused by esophageal cancer. 1 patient died as a complication of Ivor-Lewis surgery in the post-operative period. This indicates a 1 year survival rate of 16.6%.

Table 6: Histological type of esophageal cancer study subjects (n=42).

Histological type	N	%
Squamous cell carcinoma	32	76.1
Adenocarcinoma	10	23.8

Table 7: Staging of esophageal cancer study subjects.

Stage	N
3A	5
3B	5
3C	14
4	18

DISCUSSION

Most of the patients in our study were between the ages of 50-65 years with a male to female ratio of 1.8:1. This correlated with data of various other studies indicating predominance of the disease in males. It also correlated with the findings of other studies showing the tendency of the cancer to occur after 50 years of age. Yang et al had a sample size of 416 esophageal cancer patients with a median age of 60 years and a 4:1 male-female ratio.[7] Swamik Das et al had a mean age of 50 years with male to female ratio of 3:1.[8] Choksi et al studied the retrospective data of 552 patients in a single institute in India over a period of 20 years and found the mean age group to be 54.78 years and the male-female ratio to be 1.72.[9] In a recent study from India, the mean age was 51.7 years with a male female ratio of 2.53.[10] Our study correlates with most population based data which reveals that esophageal cancer incidence peaks in the 6th decade in many parts of the world.[11]

Our study showed squamous cell carcinoma in 76% cases and adenocarcinoma in 24% cases. This result is similar to other studies from India, which show SCC predominance.[12-16] Reports from a few other Asian countries such as Singapore and China have shown a decline in the incidence of SCC. Adenocarcinoma is seen to be rising rapidly in the western world. Our study did not show such a trend. The possible reasons for such high rates of SCC may be due to the presence of risk factors such as smoking, tobacco and alcohol consumption, a high number of patients belonging to lower socioeconomic strata in our study, and dietary deficiencies.

In our study the most common part of the esophagus that was involved was the lower third and GEJ followed by the mid esophagus. Our study showed higher involvement of lower esophagus (35.7%) than described in the regional cancer registry (30%). Our findings are in contrast to most Indian studies that show mid esophagus to be the most common site involved.[10] Similar to western countries our study showed a rising number of cases involving the GEJ particularly adenocarcinoma type. Slevin et al found that, for patients receiving radiation therapy for oesophageal carcinomas located in the upper third, an increased survival was found in comparison with those receiving radiation therapy for tumours in the lower third.[17] Theoretically, a tumour located in the upper part of the oesophagus should give rise to symptoms earlier in comparison with tumours in the distal oesophagus hence having better prognosis. However, surgical resections of upper oesophageal carcinomas are associated with more complications and worse survival. Therefore studies are needed to conclude whether patients with different sites of tumours in the oesophagus should receive either surgical intervention or solely chemoradiotherapy.

Esophageal cancer is a disease with poor prognosis due to the fact that most patients present late with advanced

inoperable disease. This was also seen in our study in which 43% presented with stage 4 disease and a total of 80% patients had advanced inoperable disease at the time of presentation. Most of these were above the age of 60 years. Among the 8 operable cases, 6 had presented at an earlier age of less than 50 years and had better survival. Our 1 year survival rate was only 16%. Survival for patients with oesophageal carcinoma is poor, with five-year survival rates ranging from 5-30% depending on tumour extent and treatment.[18,19] Feeding jejunostomy was the most commonly done palliative procedure and was also done after curative esophagectomy to maintain nutritional rehabilitation of the patients. In those patients were partial luminal patency was present and patient had dysphagia only to solids, self-expanding metallic stents were placed as a palliative measure. All cases were subjected to chemo-radiation nut survival of these patients was poor.

This study was limited by its small sample size and its short duration. Even though the study reproduced the trends of various other studies, it involved patients of a single centre. We also did not include various patient characteristics such as performance status, smoking, alcohol, socioeconomic status, etc. The median days of survival of the patients in various groups and stages was also not calculated.

CONCLUSION

Our study suggests that esophageal cancer occurs twice more commonly in men than in women and is seen most commonly in the 6th decade of life. SCC is still the most common type. Our study showed lower esophagus to be the most common site and GEJ to be the most common site for adenocarcinoma. The study shows that esophageal cancer is still associated with poor prognosis and low survival rates and requires newer modalities for early detection and treatment. The main cause for poor survival is due to the late presentation of patients with advanced inoperable disease. Hence better screening and selecting appropriate patients for the different treatment modalities is crucial, as well as the identification of predictive factors for response to therapy.

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