

Demography and Clinicopathological Characteristics of Primary Gastric Cancers in Northern India

Abstract

Introduction: Stomach cancer is the third leading cause of cancer related deaths in either sex. Compared to world statistics, India has a lower incidence and prevalence of this cancer. The diversity in dietary habits accounts for regional variations in incidence of stomach cancers across different parts of India. In this retrospective audit, we have tried to analyze the epidemiology of gastric cancers of northern India which were treated in our institution. **Material and Methods:** Review of the Hospital Based Cancer Registry (HBCR) of PGIMER, Chandigarh showed that 156 stomach cancer patients (only adenocarcinoma and signet ring cell histopathologies included) were treated from August 2012 to December, 2016. Descriptive statistics were employed for analyzing results. **Results:** The median age of patients was 52 years with a predilection for male sex. Mostly patients were alcoholics (53.2%) but nonsmokers (59.6%). More than 70% patients ate fruits and vegetables and did not consume processed meat. Anorexia and weight loss was the commonest presenting complaint. The commonest stages observed were stage IIIC (21.1%) and IIB (19.2%). More than 90% patients had adenocarcinoma of which intestinal variant was the commonest. Subtotal gastrectomy with D1 lymph node dissection was practiced more than total gastrectomy and/or D2 dissection. **Conclusions:** Our patients belonged to a low risk population for gastric cancer mostly due to protective dietary habits. Further reports can give better insight into the epidemiological diversity of this cancer.

Keywords: Clinicopathological, demography, features, gastric cancers, Northern India

Introduction

Stomach cancer is the fifth most common malignancy in the world, after cancers of the lung, breast, colorectum, and prostate.^[1] The 2012 GLOBOCAN data reveals that more than 70% of gastric cancers (677,000 cases in total, 45600 in men and 221000 in women) occur in developing countries and half of the world total number of cases occur in Eastern Asia (mainly in China).^[1] It is also the third leading cause of cancer death in both sexes worldwide (723,000 deaths, 8.8% of the total) and the highest estimated mortality rates are in Eastern Asia (24/100,000 in men, 9.8/100,000 in women).^[1] The latest Surveillance, Epidemiology, and End Results program data of April 2017 estimates 28,000 new cases in 2017 accounting for 1.7% of all new cancer cases.^[2]

However, compared to world statistics, India has quite a low incidence and prevalence of gastric cancers at 63,000 cases and 45,000 cases, respectively.^[1] The incidence also varies widely among the different

regions of India due to diverse sociocultural and eating habits. Our consolidated Population Based Cancer Registry data of 2012–2014 shows highest age-adjusted rates at 40–50 in Northeastern states and 10.8 in Chennai.^[3] This has been attributed to widespread consumption of dried salted fish, fermented, smoked and pickled meat and major tobacco use in these regions. The Northern states of Punjab, Haryana and Uttarakhand to which Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh caters have a lesser incidence of stomach cancers compared to other states.^[3] The 3 years consolidated Hospital Based Cancer Registry from 2011 to 2013 of Regional Cancer Center at PGIMER, Chandigarh shows 337 (1.9%) stomach cancer cases out of a total 18,068 registered cancer patients.^[4] Although people in these states are mostly vegetarian, there is substantial use of alcohol and tobacco in these regions. In this study, we have tried to analyze the demographic trends and clinicopathological characteristics of stomach cancer patients treated in PGIMER which is the biggest

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tertiary health center in Chandigarh and also the second biggest referral center in North India.

Materials and Methods

The data base of our radiotherapy department showed 274 cases of primary gastric cancer that were registered in our clinic from August 2012 to December 2016. Out of these, only 156 (56.9%) cases were histopathologically verified to have adenocarcinoma and signet ring cell carcinoma and they have been included in this study. All these patients were staged and restaged if necessary according to AJCC staging system (7th edition).^[5] Apart from surgery, endoscopy and contrast enhanced computed tomography of the abdomen contributed to final staging of cancer patients. Epidemiological variables such as age and sex distribution, dietary habits, and tobacco/alcohol abuse have been included in demographic data. On the other hand, the clinicopathological characteristics such as presenting chief complaints, histological grade, TNM staging, and type of surgery performed have also been analyzed. SPSS v 23 (IBM Corp, USA) has been used to analyze all the descriptive statistics presented in this study.^[6]

Results

The results have been presented under the following headings:

Demographic characteristics

The median age of our patients was 52 years (range, 22–85 years). Most of them (89 patients, 57%) were male. The peak incidence was found in 56–65 years age group in both sexes (32%), followed by that in 46–55 years age group (21.7%) as shown in Table 1. Most of the patients were alcoholics (53.2%) but nonsmokers (59.6%). Only 28.2% patients were found to consume processed meat. Very few patients (4.4%) had a history of gastric cancer in family. The demographical features have been summarized in Table 2.

Clinicopathological characteristics

Most of the patients (85.2%) had history of heartburn/acidity for 3–6 months before the diagnosis of cancer. However, history of confirmed chronic gastritis or peptic ulcer disease could not be elicited. The most common presenting complaint was loss of appetite and weight for 3–6 months before diagnosis found in 68.5% patients, followed by abdominal pain (58.3%), and nausea and vomiting (42.9%). Pathologically, pT3 and pN2 were the most common groups having 37.1% and 23.7% patients, respectively. Most of the patients belonged to Stage IIIC (21.1%), followed by Stage IIB (19.2%) and IIIB (17.9%). Totally 22 patients (14.1%) had metastatic disease at presentation while only two patients presented with recurrent gastric cancer. Liver was the most common site of failure found in 14.7% patients,

Table 1: Age groups of patients

Age group (years)	Number of patients in each group	Males (n=89), n (%)	Females (n=67), n (%)
≤35	9	14 (15.7)	7 (10.4)
36-45	14	18 (20.2)	13 (19.4)
46-55	15	18 (20.2)	16 (23.8)
56-65	21	30 (33.7)	20 (29.8)
66-75	6	6 (6.7)	9 (13.4)
≥76	2	3 (3.3)	2 (2.9)

Table 2: Demographical features

Demographic characteristics	Yes (n=156), n (%)	No (n=156), n (%)
Smoking status	63 (40.3)	93 (59.6)
Alcohol consumption	83 (53.2)	73 (46.7)
Consumption of smoked/fermented/salted meat	44 (28.2)	112 (71.7)
Consumption of fruits/vegetables	116 (74.3)	40 (25.6)
Family history of gastric cancer	7 (4.4)	152 (97.4)

followed by peritoneum (8.9%), retroperitoneal (4.4%), and supraclavicular nodes (4.4%). Interestingly, there was a patient who reported with duodenal metastasis.

Subtotal gastrectomy with D1 lymph node dissection was the most common surgery performed at our center. Most the patients (91%) had adenocarcinoma on histopathological diagnosis, of which intestinal type (38.4%) was the most common variant. The clinicopathological features are enlisted in Table 3.

Discussion

Although the incidence of gastric cancers in India is quite low compared to other countries, it is the second most common cause of cancer-related deaths in both sexes.^[7] There has been a declining trend in its incidence in most parts of the world, and Indian registries have also reflected similar findings.^[8-11] However, it is worthwhile to note that this apparent decrease in incidence may be due to the exclusion of esophagogastric junction tumors which was traditionally clubbed under gastric cancers but is now considered as a separate entity and is known to have a rising trend in incidence over the years.^[12,13] As mentioned earlier, there is a significant regional variation in its incidence owing to sociocultural reasons. Barad *et al.* have published retrospective data on stomach cancers in Manipur, one of the highest afflicted states with this disease.^[14] However, data from other parts of India have been largely lacking. Hence, we present here our institutional data reflecting the epidemiology of this cancer in Northern India.

The median age of our patients was 52 years, and the peak incidence was found in elderly patients between 56–65 years. Male preponderance was noted with a sex ratio of 1.3:1. Our results are in contrast with other studies which show a higher median age around 60 years or

Table 3: Clinicopathological features

Characteristics	Types/ categories	Number of patients (n=156)	Percentage of patients (%)	
Chief complaints	Anorexia and weight loss	107	68.5	
	Abdominal pain	91	58.3	
	Dysphagia	18	11.5	
	Nausea and vomiting	67	42.9	
	Malena	14	8.9	
Tumorstage (pT)	1A	0	0	
	1B	0	0	
	2	23	14.7	
	3	58	37.1	
	4A	35	22.4	
	4B	18	11.5	
	NA*	22	14.1	
Nodal stage (pN)	x	2	1.2	
	0	28	17.9	
	1	30	19.2	
	2	37	23.7	
	3A	26	16.6	
	3B	11	7	
	NA*	22	14.1	
Pathological stage	IA	0	0	
	IB	9	5.7	
	IIA	14	8.9	
	IIB	30	19.2	
	IIIA	18	11.5	
	IIIB	28	17.9	
	IIIC	33	21.1	
	IV	22	14.1	
	Recurrent	2	1.2	
	Type of surgery	Total	21	13.4
		gastrectomy		
Subtotal gastrectomy		113	72.4	
NA*		22	14.1	
Type of LND†	D1 LND†	92	58.9	
	D2 LND†	42	26.9	
	NA†	22	14.1	
Histology	Mucinous adenocarcinoma	19	12.1	
	Intestinal adenocarcinoma	60	38.4	
	Papillary adenocarcinoma	21	13.4	
	Tubular adenocarcinoma	42	26.9	
	Signet ring cell carcinoma	14	8.9	
Tumor grade	Grade 1	23	14.7	
	Grade 2	70	44.8	
	Grade 3	63	40.3	

*NA (in rows B, C, E and F) for 22 patients with metastatic disease at presentation. †LND: Lymph node dissection, NA: Not applicable

higher and sex ratio >2:1.^[14-16] This may be due to lesser prevalence of smoking in our study population. In addition, there was a fair share of nonalcoholics (46.7%) in our study. Hence, the risk due to smoking and alcoholism, which is more common in males, might have been attenuated.^[17] In addition, less than 30% patients consumed processed (fermented/salted/smoked) meat while >70% consumed fruits and vegetables adequately. This probably lowered the risk of cancer further.^[18,19] Underreporting of familial cancers is frequent in poor sociocultural conditions like that in our patients. In addition, genetic analysis to test familial predisposition was not feasible for economic reasons. Quite possibly for these reasons, we had only 4.4% patients with positive family history compared to higher figures from other studies.^[20] Chronic *Helicobacter pylori* infection is proven to be strong risk factor of gastric cancers, especially noncardia ones.^[21] Testing for *H. pylori* was not possible in this study for logistic and economic reasons. However, the presence of acidity/heartburn in >85% patients suggests extensive prevalence of chronic gastritis with or without ulcer dyspepsia, which is again a known risk factor.^[22]

Most common symptoms of our patients were weight loss and anorexia, abdominal pain, and dysphagia, which are consistent with findings from other studies.^[15,23] The most common stages in our study were Stage III and II which had 50.6% and 28.2% patients, respectively. Other retrospective studies have, however, quoted Stage IV as the most prevalent group.^[14,24] This difference is due to the fact that except 22 Stage IV patients, remaining all were locally advanced cases who were referred to us postoperatively for adjuvant therapy.

More than 90% patients had adenocarcinoma out of which majority was constituted by intestinal (38.4%) and tubular (26.9%) subtypes, similar to results from other studies.^[14,24] Overall, Grade 2 was the most common histopathological grade observed in our study, but Grade 3 was more common in younger (<35) patients, thus reaffirming results of other studies.^[25,26]

D2 gastrectomy is slowly becoming popular in high-volume oncology centers as the surgery of choice for gastric cancers. However, D1 gastrectomy has been traditionally associated with similar survival yet fewer complications and morbidity/mortality than D2 gastrectomy.^[27] Hence it is still the usual surgery most surgeons are familiar with. Our study results also reflect that most of our surgeons are still practicing D1 surgeries. If proximal stomach is not involved, distal gastrectomy is the preferred surgery as it preserves rest of the stomach and provides better functional outcome with fewer morbidity.^[28] In our study too, most of the patients (72.4%) had undergone subtotal gastrectomy.

Conclusion

Our study is probably the first of its kind to describe the demography and clinicopathological features of stomach

cancers from Northern India. The dietary habits in this part of India are shown to confer a lower risk of gastric cancer. Patients mostly present in earlier stages compared to their Western counterparts. Since dysphagia and other overt signs and symptoms of gastric cancer appear late, unexplained weight loss and anorexia in elderly patients should prompt early investigations for the detection of cancer. Dietary modification is the key primordial prevention against this cancer. To conclude, prevention and early management are the key modifiers against the natural course of disease. For this reason, physicians need to be aware of the varied epidemiology of gastric cancers from different parts of the world.

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Conflicts of interest

There are no conflicts of interest.

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