

Clinicopathological profile of gastric cancers in Al-Madinah, Saudi Arabia

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Abstract

Objective: To characterise the clinicopathological features of gastric cancer.

Methods: This retrospective study was conducted at the histopathology laboratory of King Fahad Hospital, Madinah, Saudi Arabia, and comprised record of gastric cancer patients from January 2006 to September 2015. Data of all patients who had undergone gastrectomy was included. SPSS 19 was used for data analysis.

Results: Of the 63 patients, 42(66.7%) were males while 21(33.3%) were females. The overall mean age was 58.5±14.6years (range: 23-95 years). The mean age of males at diagnosis was greater than the mean ages of females (60.4 ± 15.1vs. 54.5 ± 13.6 years). Adenocarcinoma was the most common histologic type, occurring in 49(77.8%) patients. There were 30(47.6%) cases of intestinal subtype and 19(30.2%) cases of diffuse subtypes of adenocarcinoma. The mean age of patients with intestinal subtype was greater than those with diffuse type (60.2 ± 14.9 vs. 56.8±14.2 years). Younger patients mainly presented with poorly differentiated tumours as compared to elder patients. The most common site of gastric cancer was body 28(44.5%), followed by antrum 12(30.1%).

Conclusion: Gastric cancer was diagnosed in advanced stages and in young females. Younger patients were more frequently affected by poorly differentiated and diffuse adenocarcinoma.

Keywords: Retrospective, Histopathology, Gastric cancer, Madinah, Saudi Arabia. (JPMA 67: 834; 2017)

Introduction

According to the latest Global Burden of Cancer Study (GLOBOCAN) figures, there were 14.1 million new cancer cases, 8.2 million cancer deaths and 32.6 million people living with cancer (within 5 years of diagnosis) in 2012 worldwide. More than half of them were in less developed regions. Gastric cancer (GC) was found to be the fifth-most common malignancy in the world, after cancers of the lung, breast, colo-rectum and prostate. More than 70% of cases of GC occurred in developing countries, and 50% in Eastern Asia (mainly in China). Moreover, the mortality figures make GC to be the third leading cause of 'cancer death' in both sexes all around the world.^{1,2}

Within the Kingdom of Saudi Arabia (KSA), the latest Saudi Cancer Registry Report, published in 2014, reported 291 new cases of GC in 2010, ranking it to be the 11th frequent cancer among males and females population. The Najran region had the highest age standardised rate (ASR), while Madinah region was at number 9 out of the total 13 regions of KSA.³

Although we have excellent national and international

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data reporting services, the importance of hospital-based pathology studies cannot be undermined. These studies provide us with more detailed information about any specific cancer such as histopathological types, lymph node involvement, etc. Searching last five years' medical literature regarding GC in KSA, we could not find any relevant study highlighting the problem of GC, except for a couple of literature reviews and a few case reports.^{4,5}

The current study was planned to evaluate the clinicopathological variables, such as patients' age, gender, histopathological diagnosis, tumour site, tumour grade, presence of vascular permeation and lymph node status in a series of consecutive patients with GC. We also attempted to establish possible correlations between these variables.

Patients and Methods

This retrospective study was conducted at the histopathology laboratory of King Fahad Hospital, Madinah, Saudi Arabia and comprised data of GC patients from January 2006 to September 2015. All patients who had undergone gastrectomy were included. Demographic and clinical data including patients' age, gender, histopathological diagnosis, location of the tumour, presence of vascular permeation and lymph node status was collected from pathology

reports. SPSS 19 was used for data analysis. Classification of GC into intestinal and diffuse type was made according to Lauren's criteria.⁶ All cases of malignant lymphoma were primary gastric lymphoma, as the patients did not have disseminated disease at the time of presentation, and no generalised lymphadenopathy. Other non-carcinomatous neoplasms of the stomach and all the cases of GC whose blocks or slides could not be retrieved were excluded.

Results

Of the 63 patients, 42(66.7%) were males while 21(33.3%) were females, with a male-to-female ratio of 2:1. The overall mean age was 58.5±14.6 years (range: 23-95 years). The mean age of males at diagnosis was greater

Table-1: The number, percentage, mean ages and gender distribution of our patients with gastric cancer.

Gastric tumour	No. (%)	Male/Female	Mean age years
Gastric adenocarcinoma	49 (77.8%)	34/15	58.9
Intestinal type carcinoma	30 (47.6%)	19/11	60.2
Diffuse type carcinoma	19 (30.2%)	15/4	56.8
Gastric NHL	14 (22.2%)	8/6	56.9
Total	63 (100%)		

NHL: Non-Hodgkin's lymphoma.

than the mean age of females (60.4±15.1 vs. 54.5±13.6 years).

The gastric adenocarcinoma was the most common histologic type, occurring in 49(77.8%) cases, followed by gastric lymphoma in 14(22.2%) cases. According to Lauren's classification of gastric adenocarcinoma, 30(47.6%) patients were intestinal and 19(30.2%) were diffuse type. In both sexes, the intestinal type was the most frequent, i.e. 11(73.3%) in females and 19(55.9%) in males. The mean age of patients with intestinal type was greater than those with diffuse type (60.2±14.9 vs. 56.8±14.2 years). The male-to-female sex ratio for the intestinal type was 1.7:1 and for the diffuse type was 3.8:1. Gastric non-Hodgkin's lymphoma (NHL) was seen in 14(22.2%) cases. Their ages ranged from 25 to 77 years with a mean age of 56.9±14.2 years (Table-1).

The peak incidence of GC was in the age group of ≥60 years, i.e. 35(55.5%) cases, followed by 20(31.7%) cases in the age group of 40-59 years, and 8(12.7%) cases in ages less than 40 years.

The adenocarcinomas were well, moderately and poorly differentiated in 2(4.1%), 34(69.4%) and 13(26.5%) cases, respectively. Most of the younger patients mainly presented with poorly differentiated tumours.

Table-2: Age and gender distribution of 63 patients with gastric cancer.

Age (years)	Intestinal-type		Diffuse-type		Gastric NHL		Total
	Male	Female	Male	Female	Male	Female	
20-29	-	-	-	2	1	-	3 (4.9%)
30-39	1	2	1	-	1	-	5 (7.9%)
40-49	2	1	2	1	2	-	8 (12.7%)
50-59	4	3	3	-	-	2	12 (19%)
60-69	6	2	3	-	-	3	14 (22.2%)
≥70	7	3	6	1	3	1	21 (33.3%)
Total							63 (100%)

NHL: Non-Hodgkin's lymphoma.

Table-3: Comparison of basic age, gender and location data with recent studies.

Study	Year of study	Country	Total patients [n]	Mean Age [years]	Gender Ratio [M:F]	Most Common location [%]
Satti et al ²¹	2005	KSA	55	57	2.2:1	Antrum [60%]
Ahmed et al ¹¹	2011	Nigeria	179	51	1.4:1	Antrum [64.8%]
Mabula et al ⁹	2012	Tanzania	232	52	2.9:1	Antrum [56.5%]
Selcukbiricik et al ¹⁷	2013	Turkey	796	58	2.2:1	Antrum [45.4%]
Peng et al ¹³	2014	China	2100	57	2:1	Antrum [44.57%]
Present study	2016	KSA	63	58.5	2:1	Body [44.5%]

NHL: Non-Hodgkin's lymphoma

M:F: Male-to-female ratio

KSA: Kingdom of Saudi Arabia.

Most common site of GC was the gastric body with 28(44.5%) cases reported, followed by gastric antrum 19(30.1%). The site was not available in 16(25.4%) cases. In the body, the most common histologic type was intestinal type 17(60.7%) cases, followed by diffuse type 9(32.1%) and gastric lymphoma 2(7.2%) cases. In the antrum, the most common histologic type was intestinal type with 8(42.1%) cases, followed by gastric lymphoma 7(36.9%) cases and diffuse type gastric adenocarcinoma 4(21%) cases.

In the main group of adenocarcinomas, 27(55%) cases had negative lymph nodes and 22(45%) cases had positive lymph nodes. Of the latter group, 17(77.2%) cases had metastases in one to two lymph nodes and 5(22.8%) cases in more than two lymph nodes. Lymphovascular invasion was not seen in any case.

The most common histologic types were diffuse large B-cell type with 12(85.7%) cases and mucosa-associated lymphoid tissue (MALT) lymphoma 2(14.3%). *Helicobacter pylori* (*H. pylori*) infection was reported in 6(43%) cases of NHL (Table-2).

Discussion

Although there is a major decline in the incidence and mortality of GC, it still remains an important public health problem around the world, especially in less developed countries. The incidence is particularly high in East Asia, Eastern Europe, and parts of Central and South America. Moreover, the mortality figures make GC to be the third leading cause of 'cancer death' in both sexes all around the world.^{1,2}

In our study, the male-to-female ratio was found to be 2:1, while the overall mean age was 58.5 years. The mean age of males was significantly greater than females (60.4 vs. 54.5 years). In 2013, a study from Brazil observed male-to-female ratio of 2:1 and the mean age was close to 60 years.⁷ Three studies from Africa showed a significantly higher male-to-female ratios, i.e. 3.1:1 from Sudan, 2.9:1 from Tanzania, and from Morocco 2.5:1.⁸⁻¹⁰ On the contrary, Ahmed et al. from Nigeria reported much lower male-to-female ratio of 1.4:1.¹⁰ Age wise, the Tanzanian and Nigerian GC patients had lower mean ages at diagnosis, i.e. 52 and 51 years respectively.^{9,11} A Japanese study observed a lower male-to-female ratio (1.66:1) and slightly higher mean age at diagnosis (63.2 years).¹² In a study from Southern China, the gender ratio was similar to our observation, i.e. 2:1. Although the mean age was not available in their study, they did observe that there were significantly more young (<40 years) females than males.¹³ This important finding of young female

patients at the time of diagnosis has also been observed in two other Asian countries, i.e. Brunei Darussalam and Pakistan.^{14,15} Geographically coming near the KSA, we have two recent GC publications from Turkey in 2013. Both these studies found a median age of 58 years in their research cohort.^{16,17} Within the Arabian Peninsula itself, Al-Samawi from Yemen observed a male-to-female ratio similar to our observation, i.e. 1.8:1. The mean age in that study was 59.5 years in males and 55.9 years in females¹⁸ (Table-3).

In the present study, adenocarcinoma was the most common histologic type, most common being intestinal subtype, with fewer cases of diffuse subtype. These findings are consistent with most of the recent studies cited in our article, i.e. from Brazil, Sudan and Kashmir.^{7,8,19} Interestingly, the Libyan study reports more cases of diffuse subtype than the intestinal subtype (56 patients versus 46 patients).²⁰ Although Satti et al. from Al-Khobar have also reported adenocarcinoma being the most common GC (55 out of total 94 GC cases), unfortunately they have not further subtyped the adenocarcinoma.²¹ Moreover, we found a significant association between glandular differentiation and patient's age. Younger patients presented with poorly differentiated tumours more frequently as compared to elder patients. Peng et al. have made similar observations in a study conducted in southern China.¹³

In the present study, the most common site of GC was body of stomach followed by antrum. But almost all the studies cited earlier reported 'antrum' to be the most common site of GC.^{7,9,13,20,21} Chanda et al. from Kashmir found pylorus to be the commonest site involved, followed by the body and then cardia-fundus.¹⁹ However, a recent study from Turkey has concluded that there is trend for a change in GC localisation from distal to proximal in their country.²²

We found that 45% cases of adenocarcinoma had positive lymph nodes. The Tanzanian study has reported 31.9% lymph node metastasis.⁹ Japanese scientists have observed nodal metastasis in total of 41 of their 166 sub-mucosal GC, amounting to 24.6%.¹² A Chinese study also reported a very high rate of 45.9% lymph node metastasis in their GC gastrectomy patients.²³ Thus the observations regarding the lymph node metastasis in GC are quite variable from different centres of the world. However, our experience suggests an advanced staging of the GC at the time of surgery.

NHL accounted for 22.2% of our GC cases; most (85.7%) were diffuse large B-cell type. *H. pylori*

infection was reported in 43% of cases. The Sudanese study reported only 7.1% cases (five Maltoma and one Burkitt's lymphoma).⁸ Elzouki et al. from Libya found 10.5% malignant gastric lymphoma cases in their study, with *H. pylori* frequency of 63.2%.²⁰ While observing the trend of GC in Brunei Darussalam, Chong et al. found lymphoma in 6.1% cases.¹⁴ A study from Yemen observed 7.4% lymphomas in their GC patients. The mean age for NHL in the Yemeni study was 46 years in females and 43.2 years in males.¹⁸ Satti et al. from Al-Khobar, KSA, reported 41.4% gastric lymphoma cases. They found *H. pylori* in 69% cases.²¹ Al Diab et al. from Riyadh, KSA, studied the pattern of extranodal NHL and reported that gastrointestinal (GI)NHL was the most frequent extranodal NHL and stomach accounted for more than 81% of all GI NHL cases. Diffuse large B-cell lymphoma was the most common histologic type in their experience.²⁴ In 2007, a group of scientists from Madinah studied primary gastric lymphoma (PGL). They reported that all cases were of NHL. The peak age was in the sixth decade with a slight male preponderance. Diffuse large cell lymphoma was the most frequent type (55%). *H.pylori* infection was found in only 9% cases.²⁵ Finally, from the southern city of Gizan, KSA, Gadour and Ayoola studied the frequency of upper GI malignancies. They found 24 gastric malignancy cases, of which 29.1% were PGL.²⁶ An interesting observation highlighted during comparison of the gastric lymphoma in our study is that most of the international studies have found lower percentages of gastric lymphoma.^{12,19,24} In contrast, all the KSA studies have observed higher proportion percentages of gastric lymphoma, including the present study.^{21,24-26}

Conclusion

Although GC was more common in males, its frequency was higher in females of younger age group. Moreover, a significant association between glandular differentiation and patient's age was observed. Younger patients presented with poorly differentiated tumours more frequently as compared to elder patients.

All KSA studies observed higher percentages of gastric NHL, including the present study. We recommend further prospective studies at multiple medical centres to investigate the epidemiological and aetiological factors of high frequency of gastric NHL, such as *H. pylori* infections, etc.

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Conflict of Interest: None.

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