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Clinicopathological Pattern of Gastric Cancer of Yemeni Patients in Ibb Governorate

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Abstract

Objectives: To study the clinicopathological pattern of gastric cancer including the location of the tumor in the stomach and to compare our results with other studies. **Design:** Prospective study of patients confirmed with gastric malignancy during the period from July 2016 to July 2017. **Setting:** Specialized center of gastrointestinal and liver diseases in Ibb city, Yemen. **Subjects:** All patients with histopathological confirmation of gastric malignancy. **Results:** During the study period, we had 69 patients with gastric cancer; among them 48 were males and 21 were females, with male: Female ratio is 2.2:1. The age ranged between 35 years and 90 years and the mean age was 65.87 ± 12.79 years. Most of the patients presented with epigastric pain (87%), weight loss (72.5%), pallor (65.2%), dysphagia (47.8%), vomiting (42%), palpable epigastric mass (20.3%) and hematemesis/melena (18.8%). The cardiofundal location was encountered in 33 cases (47.8%), 22 (45.8%) males and 11 (52.4%) females, the corpus location in 24 cases (26%), 20 (41.7%) males and 4 (19%) females, the antral location in 8 cases (11.6%), 4 (8.3%) males and 4 (19%) females and the whole stomach in 4 cases (5.8%), 2 (4.2%) males and 2 (9.5%) females. Adenocarcinoma constituted about 94.2%, of which the intestinal type was 87.5% and the diffuse type was 12.5%. The non-epithelial tumor was encounter 4.3%, of which 2.9% were lymphoma and 1.4% were GIST. **Conclusion:** In our studied patients, proximally located gastric cancer was the most common in both sexes.

Subject Areas

Gastroenterology & Hepatology

Keywords

Gastric Cancer, Location, Clinical Features, Risk Factors, Yemen

1. Introduction

Gastric cancer is considered the 4th leading cause of cancer death worldwide [1], but there are marked geographical variation in the incidence of gastric cancer with annual age standardized incidence variation between 5.9 to 70 per 100.000 of population for males and rate in females being about half that of males [1] [2]. The highest incidence areas of gastric cancer are reported from south Asia such as in Japan, China and Korea, whereas the lowest incidence areas being reported in western Europe and North America [3] [4]. In our geographical region, epidemiological data are scarce and only partially studied. However, the reported incidence showed a relatively low incidence of gastric cancer with a rate of 5 - 15 times lower than that of Japan [5] [6]. Classically, gastric cancer was known to be located mainly in the distal part of the stomach but in the last few decades change in this pattern was noticed in the developed countries, becoming more frequently located in the proximal parts [7] [8]. This change is associated with a steady decline in the incidence of gastric cancer which is partly explained by changes and reduction in risk factors such as decline in the incidence of helicobacter pylori, salt intake and smoking with improvement of food conservation and increased vegetables and fruit intake [2]. Histologically more than 95% are adenocarcinomas which are divided into intestinal and diffuse types, the majority being the intestinal type which accounts for 50% - 70% of the cases [9]. There is a strong link between H. pylori infection and distal gastric cancer of both histological types [2] [9]. However, the association with proximal cancer is more dubious [9]. This may suggest the implication of other risk factors in this location. In developing countries including Yemen where incidence of helicobacter pylori is high, [10] distally located gastric cancer is expected to be more common than other locations, as it is already reported in many published studies from developing countries [11] [12] [13]. Only a few retrospective studies about gastric cancer were done in our country but none of them had been studied the location of the tumor so our following study was conducted to investigate the pattern of gastric cancer including the location in different parts of stomach in Yemeni patients.

2. Materials and Methods

This study was conducted at a private center for gastrointestinal and liver diseases in Ibb city, the capital of Ibb governorate which situated in the central region of republic of Yemen (**Figure 1**). We included in this study all patients confirmed with the diagnosis of gastric cancer in the period between July 2016 and July 2017 and we excluded the patients with gastric tumor that were not

Figure 1. Yemen-Ibb governorate.

confirmed to be malignant by the histopathological examination. A verbal informed consent was taken. For all patients a comprehensive history was taken including personal data, family history of gastric cancer, history of previous gastric surgery and data regarding environmental risk factors such as smoking, qat chewing, Patients complaint, duration of symptoms and findings of complete physical examination were also recorded. Abdominal USG and basic laboratory data were performed to all patients including CBC, RBS, LFT, helicobacter pylori serology and fecal Ag.

The diagnosis of gastric cancer was done by performing upper GI endoscopy using (PENTAX-EPK-5000 Unit), the tumor was described including the location, size and endoscopic appearance. At least 6 biopsy specimens from the lesion were taken for histopathologic examination. Biopsy specimens were immediately fixed in 10% neutral buffered formalin, processed in ethanol and embedded in paraffin blocks. Biopsies were sectioned by YD-310 microtome into 4μm thick sections. Sections were stained with Hematoxylin and Eosin and examined pathologically. Suspicious or inconclusive histopathological diagnosis were sent for immunohistochemistry for confirmation of the diagnosis.

Patient's data were analyzed using SPSS 20 statistical package for social sciences (SPSS Inc., Chicago, Illinois, USA) for Windows 10. Results were written in mean and SD and P value was measured by chi square test and a significant threshold was set at. 05.

3. Results

3.1. Patient Characteristics

During the study period, we had 69 confirmed gastric cancer patients, 48 of them were males (69.6%) and 21 were females (30.4%), with male to female ratio 2.2:1. The age ranged between 35 and 90 years, with a mean age of 65.87 ± 12.79

years. The mean age for males was 68.75 ± 11.7 and was of 59.29 ± 12.97 for females. The majority of cases were distributed in the age group of 60 - 69 years and over 70 years (Table 1). Most of the patients came from Ibb governorate followed by Taiz then Al-Dalae; the majority of them 61 (88.3%) lived in rural areas and 8 cases (11.7%) had residency in urban cities (Figure 2).

3.2. Studied Risk Factors

Helicobacter pylori infection was encountered in 51 cases (73.9%), qat chewing in 47cases (68.1%) and smoking in 33 cases (47.8 %). Other reported risk factors were positive family history in 2 cases (2.9%) and past history of gastric surgery for gastric ulcer in one patient (Table 2).

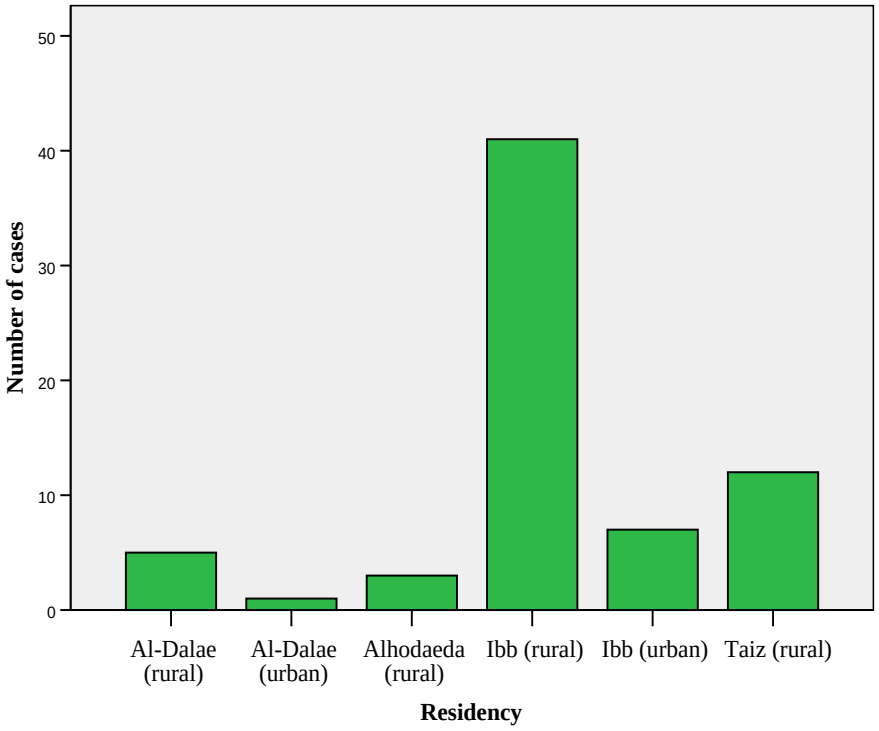

Figure 2. Distribution of cases in Ibb city and surrounding areas (in either rural or urban parts).

Table 1. Distribution of subjects according to their age (n = 69).

Age in years	Male		Female		Total	
	n	(%)	n	(%)	n	(%)
Less than 40	0	0	1	(4.8)	1	(1.4)
40 - 49	3	(6.3)	3	(14.3)	6	(8.7)
50 - 59	4	(8.3)	3	(14.3)	7	(10.1)
60 - 69	12	(25)	7	(33.3)	19	(27.5)
>70	29	(60.4)	7	(33.3)	36	(52.2)
Total	48	(100)	21	(100)	69	(100)

Table 2. Distribution of subjects according to risk factors (n = 69).

Risk factors	Male		Female		Total	
	n	(%)	n	(%)	n	(%)
	48	(69.6)	21	(30.4)	69	(100)
H. pylori infection	37	(77.1)	14	(66.7)	51	(73.9)
Smoking	29	(60.4)	4	(19)	33	(47.8)
Qat chewing	36	(75)	11	(52.4)	47	(68.1)
Family history of gastric Ca	1	(2.1)	1	(4.8)	2	(2.9)
History of gastric surgery	1	(2.1)	0	0	1	(1.4)

3.3. Symptoms Present at Time of Gastric Cancer Diagnosis

The most frequent clinical presentations were epigastric pain, weight loss and indigestion which occurred in 87%, 72.5% and 69.6% respectively (Table 3).

3.4. Ultrasonographic Findings

Forty-four patients (63.8%) had ultrasonographic evidence of advance stage in the form of increased gastric wall thickness in 33 (47.8%), LNs metastasis in 5 (7.2%), hepatic metastasis in 4 (5.8%) and increase gastric wall thickness with both LNs and hepatic metastasis in 2 (2.9%). While the remainder patients 25 (36.2%) were normal sonographically (Table 4).

3.5. Gastric Cancer Location, Gross Appearance and Histopathological Type Are Shown in Table 5

The cardiofundal (proximal) location was the most frequent location found in 47.8% of all patients. It was observed in 45.8% of male patients compared with 52.4% of female patients. The most common macroscopic appearance according to Borrmann classification system was type III (ulcerating tumor) seen in 73.9% of patients. The gastric adenocarcinoma was the most common histopathological type, occurring in 94.2% of cases, and most of the tumors had a well-differentiated grade in 33.3% of cases. This was followed by poorly differentiated and moderately differentiated grades in 31.9% and 10.1% respectively. Signet cell carcinoma was documented in 8.7% and to a lesser extent mucinous, undifferentiated and papillary adenocarcinoma. According to Lauren classification of gastric carcinoma, 81% were intestinal, 13% were diffuse adenocarcinoma and the remainder 6% were other histological types.

Statistically there were no significant differences between males and females regarding the clinical presentations and the USG findings (p value > 0.05). There were also no significant differences between males and females in the distribution of the risk factors except for smoking (p value = 0.002) which affect males more than females.

Table 3. Distribution of subjects according to clinical presentations (n = 69).

Clinical manifestations	Male		Female		Total	
	n	(%)	n	(%)	n	(%)
	48	(69.6)	21	(30.4)	69	(100)
Epigastric pain	41	(85.4)	19	(90.5)	60	(87)
Weight loss	37	(77.1)	13	(61.9)	50	(72.5)
Indigestion	31	(64.6)	17	(35.4)	48	(69.6)
Pallor	34	(70.8)	11	(52.4)	45	(65.2)
Nausea	28	(58.3)	15	(71.4)	43	(62.3)
Dysphagia	21	(43.8)	11	(52.4)	32	(46.4)
Vomiting	19	(39.6)	10	(47.6)	29	(42)
Palpable epigastric mass	11	(22.9)	3	(14.3)	14	(20.3)
Upper GIT bleeding	9	(18.8)	4	(19)	13	(18.8)
Postprandial fullness	8	(16.7)	4	(19)	12	(17.4)

Table 4. Distribution of subjects according to USG findings (n = 69).

USG findings	Male		Female		Total	
	n	(%)	n	(%)	n	(%)
	48	(69.6)	21	(30.4)	69	(100)
Normal	14	(29.2)	11	(52.4)	25	(36.2)
Thick gastric wall	24	(50)	9	(42.9)	33	(47.8)
L.Ns metastasis	5	(10.5)	0	0	5	(7.2)
Hepatic metastasis	3	(6.3)	1	(4.8)	4	(5.8)
Thick gastric wall with hepatic & LN metastasis	2	(4.2)	0	0	2	(2.9)

Table 5. Anatomical site, macroscopic appearance* and histopathological types**.

Variables		Response	Male		Female		Total	
			n	(%)	n	(%)	n	(%)
			48	(69.6)	21	(30.4)	69	(100)
Anatomical site		Cardia & Fudus	22	(45.8)	11	(52.4)	33	(47.8)
		Body	20	(41.7)	4	(19)	24	(34.7)
		Antrum	4	(8.3)	4	(19)	8	(11.6)
Macroscopic appearance		Diffuse	2	(4.2)	2	(9.5)	4	(5.8)
		Polypoidal	8	(16.7)	5	(23.8)	13	(18.8)
		Ulcerative, infiltrative	37	(77.1)	14	(66.7)	51	(73.9)
		Diffuse	3	(6.3)	2	(9.5)	5	(7.2)
Histopathologic type	**Intestinal type**	Well differentiated	16	(33.3)	7	(33.3)	23	(33.3)
		Moderate differentiated	5	(10.4)	2	(9.5)	7	(10.1)
		poorly differentiated.	17	(35.4)	5	(23.8)	22	(31.9)
		Mucinous	3	(6.3)	0	0	3	(4.3)
	Diffuse Type	Papillary	0	0	1	(4.8)	1	(1.4)
		Undifferentiated	3	(6.3)	0	0	3	(4.3)
		Signet cell ca	3	(6.3)	3	(14.3)	6	(8.7)
		Sequamous	0	0	1	(4.8)	1	(1.4)
	Others	GIST	0	0	1	(4.8)	1	(1.4)
		Lymphomas	1	(2.1)	1	(4.8)	2	(2.8)

*According to Borrmann classification [21]. **According to Lauren and WHO classification [22] [23].

4. Discussion

Our study is the first study to show the pattern of gastric cancer that included the location in different parts of the stomach in Yemeni patients. It was conducted in Ibb city which is situated in the central region of Yemen and has a population number of 2,560,000 on 2011 [14] [15]. A proportion of citizens of Ibb governorate are expatriate outside the country, mainly in USA therefore they have dual citizenship [15]. Now with the recent events in Yemen, the population number significantly increased due to immigration of large number of population from unsafe places mainly from Taiz governorate to have a temporary residency in Ibb city.

We had 69 cases of confirmed gastric cancer collected in the period from July 2016 to July 2017 which represent a relatively large number in a short period of time in a single medical center compared to the number of cases reported in other studies from the neighboring countries, for example in Saudi Arabia 86 cases were collected in 7 years period between 1984-1990 at King Khalid University Hospital (KKUH), Riyadh. [16]

And 54 cases of gastric cancer were collected over 4 years period (1989-1993) in Asir central hospital [11]. Furthermore, In Oman according to national cancer registry the average annual case registered was around 70 cases per year between 1997 and 2007 [17]. This high number of cases in our study in one year and in a single medical center may reflect an increasing incidence of gastric cancer in Yemen, which needs to be more evaluated by national multicenter epidemiological studies and by foundation of national cancer registry.

In our study male to female ratio is similar to other studies from Yemen and from the neighboring counties [4] [5] [11] [17]. The most affected age group for males was over 70 years in 29 cases (42%) followed by the age group 60 - 69 years in 12 cases (17.4%). Meanwhile in females the most affected age groups were both 60 - 69 years and over 70 years in 7 cases for each (33.3%). The females are affected by one decade earlier than males. Moreover the mean age of our patients in both sexes was higher by about one decade, in comparison with other studies from our country and from the neighboring countries [5] [16] [17]. But it is similar to the mean age that was reported from western countries [2]. In our study the proximal location is the most frequent in both sexes, accounting for about half of the cases being in agreement with other studies reported from the developed countries and in few recent studies from regional countries [17] [18] [19], but in discordance with what is known in the global medical literature and with many oldest and recent studies from developing countries [11] [12] [13].

Interestingly, the majority of our patients being in 7th and 8th decade of age and the increased incidence of the proximal location is similar to the picture in the western countries [2] [3]. An acceptable explanation to this aspect may be the increased life expectancy in our population and the risk of cancer increases with advancing age as it is shown among our studied patients. Another explana-

tion may be the rapid westernization of the life style in our community especially in Ibb governorate where many families have more than one member expatriate in the USA and gulf countries. Furthermore despite the high incidence of H. pylori infection, the proximal location of gastric cancer in our study was the commonest. This pattern may reflect the impact of other risk factors in our community such as chewing qat habit. Qatha edulis fresh leaves are chewed usually for several hours a day in the afternoons, becoming the most wide spreading popular habit in Yemen where approximately 60% - 90% of males and 35% of females chew qat daily [20]. Different types of pesticides are usually used by greedy farmers to grow the plant leaves faster to face the increasing demand of the market. As most cases came from rural areas where this plant grows, this may reflect a high exposure rates to pesticide by chewing qat and by other ways such as skin contact and inhalation. It is not well known if there is correlation between gastric cancer and qat and if present, is it due to qat substances or the pesticides use in it or both. These points need to be investigated by large community based studies. In addition to that in rural areas salted and smoked food intake is increased owing to salt preservation and wood cooking which still used in those areas.

Most of our cases presented with epigastric pain, weight loss, pallor and dysphagia in which reflect the late presentation of our patients, that also supported by the USG findings in which only 36.2% of the cases are normal ultrasonografically and the remainder were abnormal ranging from increase gastric wall thickening to distant metastasis. The late presentation of most of our cases may be attributed to poverty, lack of awareness about the disease, lack of education programs, lack of insurance and lack of accessibility to specialized health care centers, as most patients usually present to general practitioner doctor for their early nonspecific symptoms.

The intestinal type adenocarcioma (81%) was more common than diffuse type (13%) which is similar with other studies [11] [12] [16] [17]. Non-Hodgkin malignant lymphoma of the stomach represented 2.8% of our patients, and it is lower than the reported 7.4% in one study from our country, and in the neighboring Saudia Arabia, were NHL represented 14% [5] [19]. In a recent study from Riyadh area, NHL represented 22% of all gastric cancer cases [16]. However our result is in agreement with figure from global literature, which give rates of less than 5% for NHL [1] [2] [3].

Finally, the limitations of our study are that it was a single clinic based study so epidemiological conclusions can't be drawn mainly in the absence of national cancer registry. Furthermore data about the management and of outcome of our cases is not available. another limitation is that we could not get detailed information about some risk factors like the diet history as most of our patients came from rural areas with low education and socioeconomic standard.

5. Conclusion

Proximally located gastric cancer is increasing in expense of the distal location.

Multicenter studies and national cancer registry are needed to draw a definitive epidemiological conclusion.

References

[1] Brain, R.W., Nicki, R.C., Stuart, H.R. and Ian, D.P. (2014) Davidson's Principle and Practice of Medicine. 22nd Edition, Churchill Livingstone, Edinburgh London New York Oxford Philadelphia, Chapter 22, 877.

[2] Mark, F., Lawrence, S.F. and Lawrence, J.B. (2016) Sleisenger and Fordtran's Gastrointestinal and Liver Disease. 10th Edition, Vol. 1, Saunders, Philadelphia, 901-906.

[3] Dan, L.L., Dennis, L.K., Jameson, J.L., Anthony, S.F., Stephen, L.H. and Joseph, L. (2012) Harrison's Principle of Internal Medicine. 18th Edition, Vol. 2, John Kretschmer, New York, 765-767.

[4] Joseph, B.M., Mabula, D.M., Mheta, K., Phillipo, L.C., Fabian, M. and Peter, F.R. (2012) Gastric Cancer at a University Teaching Hospital in Northwestern Tanzania: A Retrospective Review of 232 Cases. *World Journal of Surgical Oncology*, **10**, 2.

[5] Abdulla, S.A. and Saleh, M.A. (2013) Histopathology of Gastric Cancer in Yemen Seven Years Retrospective Analysis. *Sudan JMS*, **8**, 91-92.

[6] Parkin, D.M., Bray, F., Ferlay, J. and Pisani, P. (2005) Global Cancer Statistics, 2002. *CA: A Cancer Journal for Clinicians*, **55**, 74-108. https://doi.org/10.3322/canjclin.55.2.74

[7] National Cancer Institute (2015) Gastric Cancer Treatment—for Health Professionals (PDQ®).

[8] Anderson, W.F., Camargo, M.C., Fraumeni, J.F., Correa, P., Rosenberg, P.S. and Rabkin, C.S. (2010) Age-Specific Trends in Incidence of Noncardia Gastric Cancer in US Adults. *JAMA*, **303**, 1-5.

[9] Massimo, R., Matteo, F. and Graham, D.Y. (2015) Epidemiology of Gastric Cancer. Springer International Publishing Switzerland.

[10] Al-Makdad, A.M., Al-Dholaee, M.H., Thabet, A.A.K., Al-Haimi, M.A., Balfaqih, O.S. and Al-Hadad, A.M. (2013) Prevalence of Helicobacter Pylori Infection in Yemeni Patients. *Yemeni Journal for Medical Sciences*, **7**, 37.

[11] David, A.S., Abdul-Basit, A., Mohammad, I., Abdul-Rauf, K. and Abdul-Naser, A.B. (1995) Gastric Cancer: A Clinicopathological Analysis of 54 Cases Seen at Asir central Hospital. *Saudi Medical Journal*, **16**, 308-310.

[12] Nassima, C., Khan, A.R., Romana, M. and Saud, L. (2007) Histopathology of Gastric Cancer in Kashmir—A Five Year Retrospective Analysis. *JK SCIENCE*, **9**, 23.

[13] Miomir, P., Aleksandar, K., Nebojsa, D., Vuka, K., Zoran, R., Milan, R., Nikola, I. and Ivan, P. (2004) The Importance of Primary Gastric Cancer Location in 5-Year Survival Rate. *Arch Oncology*, **12**, 51.

[14] Statistical Yearbook 2011. Central Statistical Organisation. https://en.wikipedia.org/wiki/Ibb_Governorate

[15] http://www.wikiwand.com/en/Ibb_Governorate

[16] Mofleh, I.A. (1992) Gastric Cancer in Upper Gastrointestinal Endoscopy Population: Prevalence and Clinicopathological Characteristics. *Annals of Saudi Medicine*, **12**, 548-551.

[17] Haitham Al-Mahrouqi, L.P. and Sharples, K. (2011) Incidence of Stomach Cancer in Oman and the Other Gulf Cooperation Council Countries. *Oman Medical Jour-*

nal, **26**, 258-262.

[18] Selcukbiricik, F., Buyukunal, E., Tural, D., Ozguroglu, M., Demirelli, F. and Serdengecti, S. (2013) Clinicopathological Features and Outcomes of Patients with Gastric Cancer: A Single-Center Experience. *World Journal of Gastroenterology*, **19**, 2154-2161.

[19] Albasri, A.M., Elsawaf, Z.M., Hussainy, A.S. and Alhujaily, A.S. (2017) Clinicopathological Profile of Gastric Cancers in Al-Madinah, Saudi Arabia. *The Journal of the Pakistan Medical Association*, **67**, 834-838.

[20] Balint, E.E., Falkay, G. and Balint, G.A. (2009) Khat: A Controversial Plant. *Wiener Klinische Wochenschrift*, **121**, 604-614. https://doi.org/10.1007/s00508-009-1259-7

[21] Borrmann, R. (1926) Geschwulste des Magens und Duodenum. In: Henke, F. and Lubarch, O., Eds., *Handbuch der spezielen pathologischen anatomie und histology*, Springer Verlag, Berlin, 35.

[22] Felix, B., Elfriede, B., Uta, D., Arnulf, H.H. and Stefan, M. (2014) Pathohistological Classification Systems in Gastric Cancer: Diagnostic Relevance and Prognostic Value. *World Journal of Gastroenterology*, **20**, 5680-5681.

[23] Fléjou, J.F. (2011) WHO Classification of Digestive Tumors: 4th Edition. *Annales De Pathologie*, **31**, S27-S37. https://doi.org/10.1016/j.annpat.2011.08.001