The Scientific Journal of University of Benghazi

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The Histopathological Characteristics of Gastric Tumor at The National Oncology Center in Benghazi in the Period of 2020-2021

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Received: 18 / 04 / 2023; Accepted: 19 / 05 / 2023

الملخص:

يعتبر سرطان المعدة على مستوى العالم مشكلة صحية رئيسية. أظهرت العديد من الدراسات أن الأورام الغدية تمثل حوالي 90٪ من جميع سرطانات المعدة. وينقسم من الناحية النسيجية إلى نوعين رئيسيين؛ النوع المعوي والمنتشر. **الهدف:** الهدف من هذه الدراسة هو تحديد وتيرة وخصائص التشريح المرضي لسرطان المعدة بين مرضى المركز الوطني للسرطان ببنغازي في الفترة (2020-2021). **المواد والطرق:** دراسة بأثر رجعي لـ 52 حالة سرطان معدة من أرشيف مركز الأورام الوطني ببنغازي وتحليل البيانات مع SPSS. **النتيجة:** في فترة البحث بين كانون الثاني (يناير) 2020 ومايو (أيار) 2021، بلغ العدد الإجمالي للمرضى المؤكدين بسرطان المعدة 52 حالة، وتراوح عمر المرضى بين 29 إلى 86، ومتوسط العمر 63، وبلغ عدد الذكور 31 (31) حالة (59.6). ٪) وواحد وعشرون (21) من الإناث (40.4٪). كان الورم الغدي المنتشر سائدًا على النوع المعوي (25٪ و19.2٪ على التوالي). 48٪ من الحالات كانت من نوع غير محدد و3.8٪ كانت أورام معدية معوية. عرضت معظم الحالات في المرحلة الرابعة. **الخلاصة:** كانت الصورة التشريحية المرضية لسرطان المعدة في دراستنا مماثلة للدراسة المنشورة سابقاً والتي أجريت في بنغازي مع سرطان غدي سائد للذكور وكان السرطان المنتشر هو السرطان الشائع. تُعزى بعض عوامل الخطر مثل الإصابة ببكتيريا الملوية البوابية والتدخين وفقر الدم.

الكلمات المفتاحية: سرطان المعدة، السرطان الغدي، تصنيف لورين، تصنيف منظمة الصحة العالمية، بكتيريا هيليكوباكتر بيلوري، التشريح المرضي.

Abstract

Background: Gastric cancer is considered globally a major health issue. Many studies have shown that adenocarcinomas represent about 90% of all gastric cancers. It is subdivided into two main histological types; intestinal and diffuse. **Aim:** The aim of this study is to determine the frequency and the histopathological characteristics of gastric adenocarcinoma among patients of the National Cancer Center of Benghazi in the period of 2020-2021. **Subjects and methods:** A retrospective study of 52 gastric cancer cases from the archive of the National Oncology Center in Benghazi and data was analyzed with SPSS. **Results:** In the research period between January 2020 to May 2021, the total number of patients with confirmed gastric cancer was 52 cases. The patients' ages were between 29 to 86 and the mean age was 63. Thirty-one (31) cases were male (59.6%) and twenty-one (21) were female (40.4%). Diffuse adenocarcinoma was predominant over the intestinal type (25% and 19.2 % respectively). 48% of the cases were of undetermined type and 3.8% were gastrointestinal stromal tumors. Most of the cases presented at stage IV. **Conclusion:** The histopathological picture of gastric cancer in our study was similar to a previously published study done in Benghazi with male predominant and diffuse adenocarcinoma as the more common cancer. Some risk factors are attributed such as infection with H pylori, smoking and anemia.

Keywords: gastric cancer/ adenocarcinoma /Lauren classification/ WHO classification / Helicobacter pylori/ histopathology.

1. INTRODUCTION

Gastric cancer (GC) occurs when cells in the lining of the stomach grow uncontrollably and form tumors that can invade normal tissues and spread to other parts of the body. Cancers are described by the types of cells from which they arise. About 90-95% of gastric cancers arise from the lining of the stomach, called adenocarcinoma. Other cancers can arise in the stomach, including gastrointestinal stromal tumors (GIST), lymphoma, and carcinoid tumors.

Gastric cancer is rare before the age of 40, but its incidence steadily climbs thereafter and peaks in the seventh decade of life [(1)]. Gastric carcinoma is the fourth most common malignancy worldwide and remains the second cause of death of all malignancies worldwide [(2)(3)]. The five-year survival rate is relatively good only in Japan, where it reaches 90% [(4)].

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In European countries, survival rates vary from ~10% to 30% [(5)]. The high survival rate in Japan is probably achieved by early diagnosis by endoscopic examinations and consecutive early tumor resection. The incidence shows wide geographical variation; more than 50% of the new cases occur in developing countries. Gastric cancer is a multifactorial disease, where many factors can influence its development, both environmental and genetic [(6)]. Gastric cancer is clinically classified as an early or advanced stage to help determine the appropriate intervention. Histologically, it is classified into subtypes based on major morphologic component. Early gastric carcinoma is defined as invasive carcinoma confined to mucosa and/or submucosa, with or without lymph node metastases, irrespective of the tumour size. The prognosis of early gastric carcinoma is excellent, with 5-year survival rate as high as 90%. In contrast, advanced gastric carcinoma which invades into muscularis propria or beyond carries a much worse prognosis, with a 5-year survival rate of about 60% or less [(7)]. The 2010 WHO classification recognizes four major histologic patterns of gastric cancers: tubular, papillary, mucinous and poorly cohesive (including signet ring cell carcinoma) [(8)]. However, it is not as widely used as the

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Lauren classification, which distinguishes two major subtypes of GC, intestinal and diffuse [9]. The aim of this study is to determine the frequency and the histopathological characteristics of gastric adenocarcinoma among patients of the National Cancer Center of Benghazi in the period of 2020-2021.

2. MATERIAL AND METHODS:

Patients: A retrospective study was conducted on 52 patients diagnosed with gastric tumors and who came for follow-ups and to receive the designed treatment within the period from January 2020 to May 2021 in the National Oncology Center of Benghazi. Histopathological diagnosis of all cases was performed by a trusted pathologist. The study screened for all gastric tumor types and included patients above the age of 18 years from both genders.

Study Design: Patient medical records in the archives of the National Oncology Center were reviewed to obtain the following data: age, sex, tumor location (only including those located in the body, antrum, and pylorus of the stomach), and histologic subtypes based on the Lauren classification, along with differentiation grade, infiltration grade, and the presence of ulceration, lymph node invasion, history of pernicious anemia, smoking, Helicobacter pylori and a family history of any tumor.

Statistical Analysis: Data was processed using Microsoft Excel 2010 then coded and processed on an IBM-compatible computer, using the Statistical Package for Social Science (SPSS) software for statistical analysis.

3. RESULTS:

Age group and gender distribution: During the study period between January 2020 to May 2021, a total number of 52 cases of gastric tumor were found. The patients' ages were between 29 to 86 and the mean age was 63 (Figure 9), 31 of the cases were male (59.6%) and 21 were female (40.4%) (Table 3) (Figure 1).

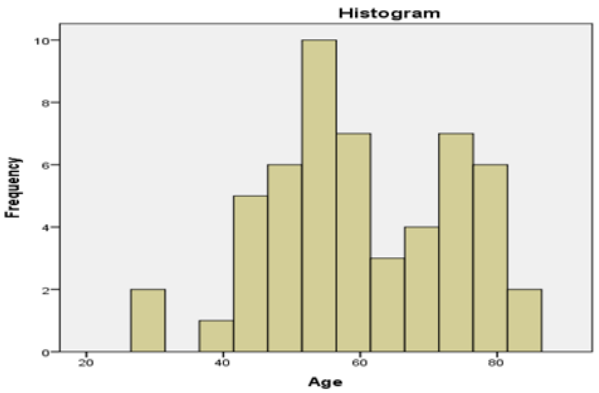


Figure 1. The age group for the gastric tumor cases

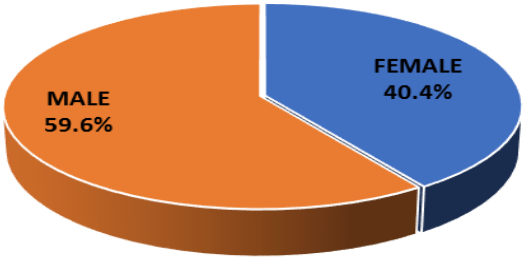


Figure 2. The male-to-female ratio

Histopathological types: From the 52 cases the majority of cases were adenocarcinoma (96%) and only 2 were gastrointestinal stromal tumors (GIST) (3.8%). As shown in the histopathology reports obtained from patents' files, the histopathological subtypes of gastric adenocarcinoma are shown in Table 2 and Figure 3.

Table 1. The histopathological type of gastric tumors

Histopathological type		Frequency	Percentage
Valid	diffuse-type adenocarcinoma	13	25
	Gastrointestinal stromal tumor (GIST)	2	3.8
	indeterminate adenocarcinoma	25	48
	intestinal type adenocarcinoma	10	19.2
	Mixed intestinal and diffuse type adenocarcinoma	2	3.8
	Total	**52**	**100.0**

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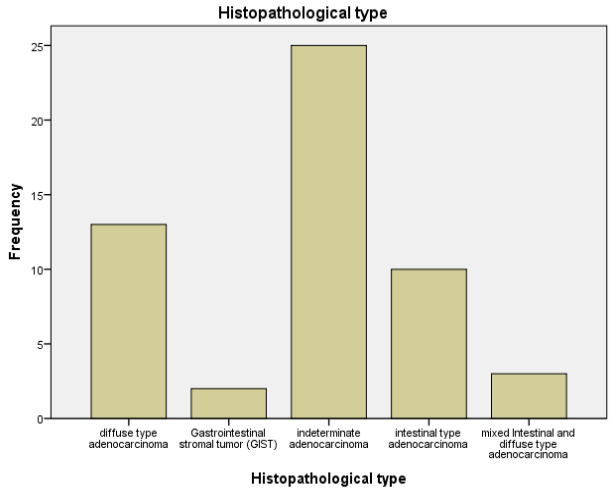


Figure 3. The histopathological types of all cases.

Grade of differentiation: Regarding the grade of differentiation most of the tumor types were poorly differentiated adenocarcinoma (24 cases); followed by moderately differentiated type with 10 cases. More details are shown in Table 5 and Figure 12.

Table 2. The grade of differentiation

Type of cancer		Frequency	Percent%	Valid Percent
Valid	Gastrointestinal Stromal tumor(GIST)	2	3.8	3.8
	Moderately differentiated adenocarcinoma	10	19.2	19.2
	Moderately to poorly differentiated adenocarcinoma	5	9.6	9.6
	Not specified	9	17.3	17.3
	Poorly differentiated adenocarcinoma	24	46.2	46.2
	Well-differentiated adenocarcinoma	2	3.8	3.8
	Total	**52**	**100.0**	**100.0**

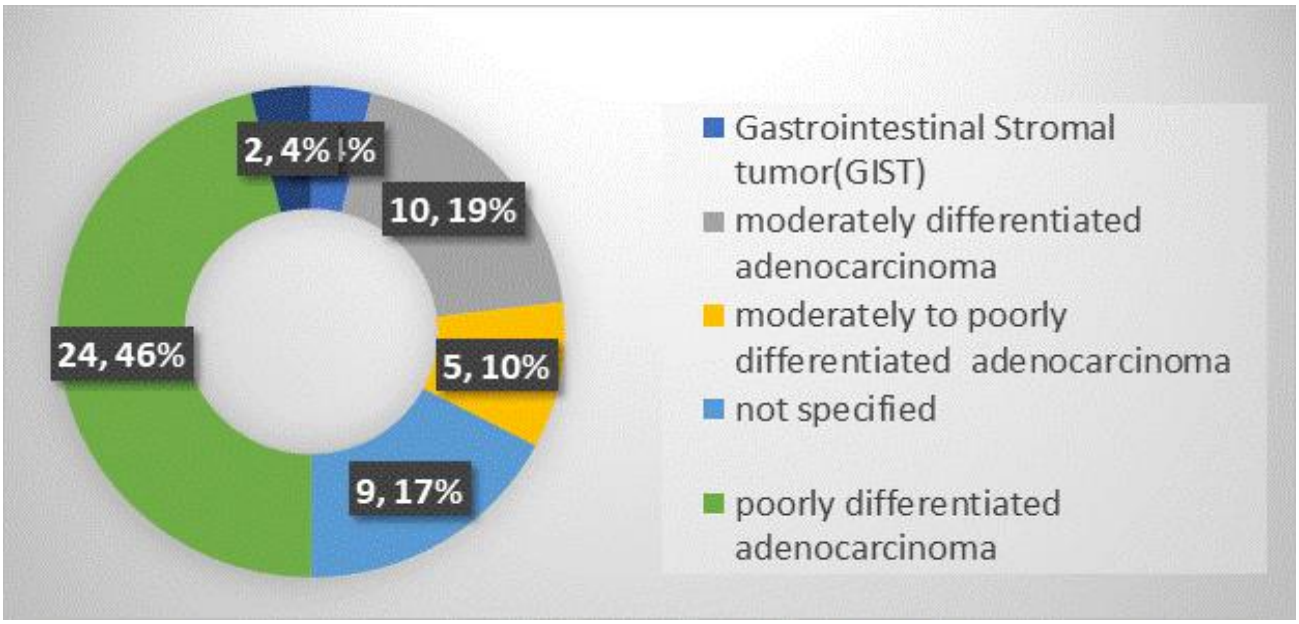


Figure 4. The grade of differentiation

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Grade of the tumor: The most frequent grade was (grade III) as shown in Table 6 and Figure 13.

Table 3. The grade of the tumor

Grade	Frequency	Percent
1	2	3.8
2 to 3	3	5.8
2	9	17.3
3	24	46.2
not specified	14	26.9
Total	**52**	**100.0**

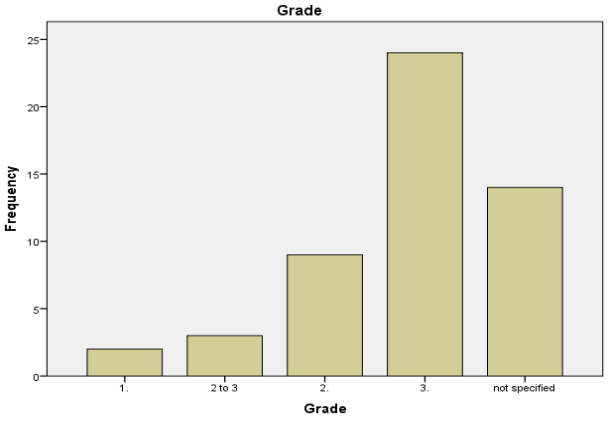


Figure 5. The grade of the tumor

Stage of the tumor: Most of the patients presented with stage IV. Table 5. figure 6.

Table 4 The stage of the tumor

Stage	Frequency	Percent %
I	8	15.4
II	2	3.8
III	7	13.5
IV	26	50.0
Not specified	9	17.3
Total	**52**	**100.0**

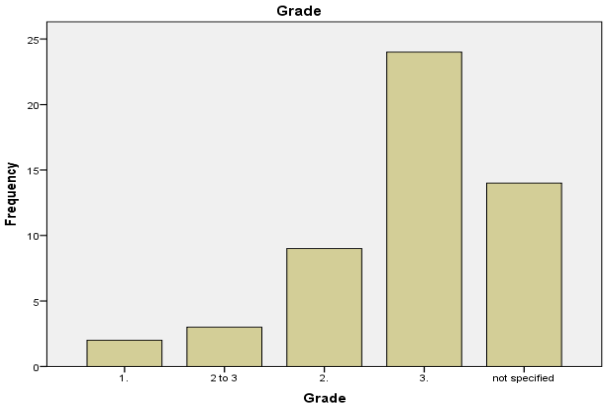


Figure 6. The stage of the tumor

The Correlation between gender and histopathological type: We correlate the gender with the tumor type to see the frequency of each type in-between male and female groups; as shown in Table 6 and Figure 7

Table 5 The correlation between gender and the histopathological type

		Histopathological type				
		Diffuse type adenocarcinoma	**Gastrointestinal stromal tumor (GIST)**	**indeterminate adenocarcinoma**	**intestinal type adenocarcinoma**	**mixed Intestinal and diffuse type adenocarcinoma**
Gender	**female**	9	1	8	3	0
	male	4	1	17	7	2
Total		**13**	**2**	**25**	**10**	**2**

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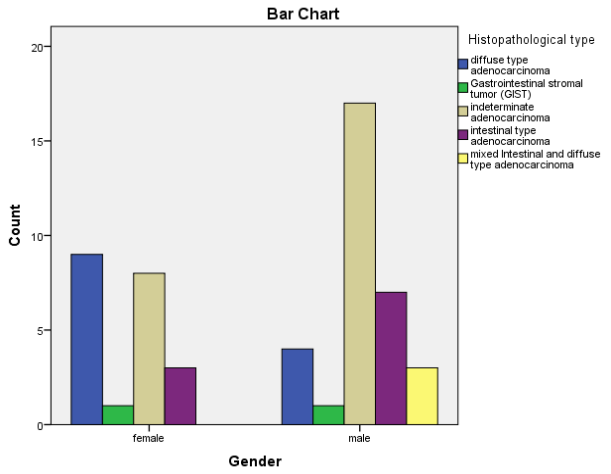


Figure 7 The correlation between gender and the histopathological type

Result of Some Clinical Parameters: The most common presenting symptom was abdominal pain. H, pylori were positive in 4 cases (7.6%). Pernicious anemia was manifested in 3 of the cases (5.8%). Smoking history was positive in some cases.

4. DISCUSSION

Gastric cancer is considered globally a major health issue [10]. Many studies have shown that adenocarcinomas represent about 90% of total gastric cancers [11]. However, many studies proposed that the incidence of gastric cancer is declining especially in developed countries and this decrease is due to the successful reduction of *H. pylori* infection. Other studies attribute the cause to the changes in food preservation and cessation of smoking and processing of meat. The decline has also been attributed to the greater availability of fresh fruits and vegetables instead of preserved ones [12].

In this study, we obtained a retrospective study to screen for gastric cancer at the National Cancer Center in Benghazi. During our review of the literature, there were only a few published studies and data that screen some different parameters of gastric cancer in Libya. However, studies by El-Mistiri et al., [13] and Elzouki and Alkhomsi [14] showed that stomach cancer is the second most prevalent GIT malignancy in Benghazi (the largest district in eastern Libya) after colorectal cancer. The age-standardized rates of stomach cancer in the Benghazi cancer registry were 11.6 new cases per 100,000 men-years and 8.8 per 100,000 women-years, respectively [15].

Worldwide, it is believed that males are affected more than females [16] and this is consistent with our study, where males represented (60%) of cases. In this study, the age distribution was between 29 to 86 and the mean age was 63. However; in Elzoki et al.'s [17] study the mean age was 55.5. Most of our cases were adenocarcinomas (96%) and this is also consistent with the global reports from different areas in the world.

According to the Lauren classification, we conclude a predominance of diffuse gastric cancer over the intestinal type at 25% and 19.2% respectively and this is in agreement with Elzoki et al. [17] who showed that diffuse adenocarcinoma occurred in 56 patients (49.1%), intestinal adenocarcinoma in 46 (40.4%) and malignant gastric lymphoma in 12 (10.5%). This is also consistent with a Jordanian study where most of the cases were of the diffuse, signet ring type (52%, 53 cases), whereas 40% were the intestinal type (4 cases) [18], and also with Mohamed et al. [19] and Gaballah et.al [20], two Egyptian studies where the diffuse pattern was predominant. However, this result is in discordance with some other studies done in other Arab countries which show that histologically, the intestinal type of cancer is more common than diffuse cancer in Sudan, Yemen, Jordan and Tunisia [21][22][23][24] [25][26][27]. The study of Elghali et al. [26] obtained the largest number of cases (867 cases) and found that (635 cases)72% were of the intestinal type and (241 cases) 28% were of the diffuse type. This is similar to another Egyptian study which showed the intestinal type in 60 cases (78%) and the diffuse type in (17 cases) 22% [28]. Additionally, in a Moroccan study, most of the cases were the intestinal type (65 cases)67% compared with the diffuse type (32 cases) 33% [29]. It is important to mention that 48% of our cases were of the indetermined type where the pathologist did not provide (or could not specify) a specific subtype of gastric adenocarcinoma, so we only include a comparison between the other two subtypes (diffuse and intestinal) with the results of previous studies as following similar published research. Most of our gastric cancer cases were discovered in the late stages 26 cases (50%), which is in agreement with Elzoki et al. [17] where the number of patients was 144 and the number of cases diagnosed in the late stage 65 (62%). This is possibly due to a lack of awareness and knowledge regarding gastric cancer symptoms and the inadequacy and unavailability of investigation and screening programs.

Accessibility to data was limited and there were no electronic databases available. Furthermore, some histopathological reports did not give a full diagnosis or refer to a specific classification. Some data was missing regarding subtype grade and stage. During writing, there were inadequate studies done in our region to compare with and analyse any change in pattern and histological characters.

5. CONCLUSION

The histopathological picture of gastric cancer in this study was similar to a previously published study done in Benghazi with male predominant and diffuse adenocarcinoma being the common cancer subtype. Most of the histopathological patient's reports showed poorly differentiated stage IV images. Some risk factors are attributed, such as infection with H pylori, smoking and pernicious anemia.

A good strategy for health planning to improve the quality of health services systems, and educational programs to spotlight gastric cancer and its risk factors will minimise incidence among patients and facilitate early detection and treatment before the late stages of cancer. More research is needed in the future.

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