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RESEARCH ARTICLE

Study of Demographic and Clinical Characteristics of Hospitalized Patients with Gastric Cancer: A Retrospective Study

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Abstract: Gastric cancer remains as second most common malignancy-related mortality in the world. This study aimed at evaluate clinical and demographic characteristics of gastric cancer in specific sample of Emirati patients.

Patients & Methods: This cross-sectional study was conducted on 176 patients between 2019 and 2024 with pathological documented gastric cancer were admitted in American Hospital Dubai in Dubai from 2019 to 2024 (according to census of patients). Data about age, gender, gastric cancer family history, chief complaint, manifestations, anatomic stomach involvement, pathologic types, and stage of disease were obtained from medical files. Descriptive and analytical analysis was performed using SPSS v.16.
Results: The mean age was 64.61 (SD=13.5), the ratio of male to female was 2.38:1. Most common anatomic involvement was antrum & pylorus (49.1%). prevalence of intestinal and diffuse adenocarcinoma was close, (23.9%) and (23.3%), respectively. Stage IV was most common stage (45.9%), and common manifestations composed of: gastric pain and weight loss,(54.5%), vomiting (42%),and anorexia (35.8%).Most common age group involved by diffuse adenocarcinoma was 40-54 age group (34.1-%), and there was statistically significant relationship between diffuse adenocarcinoma with (40-54)-year-old age group (p=0.046) and upper 69-year-old age group (p=0.03), in contrast , there wasn't any significant statistic relationship between intestinal adenocarcinoma and separated anatomic stomach areas.
Conclusion: There was similarity between the result of this study and some other comparable investigations, consisted of: distribution of gender, manifestations, most common stage, pathologic types, relationship of pathologic types with age groups, In spite of presence differences like: most common anatomic area involvement and lower mean age in comparison with developed countries

Keywords: Gastric Cancer; Pathologic Types; Anatomic Involvement; Pathologic Types

1. Introduction

The stomach represents a unique organ for studying carcinogenesis due to its acidic environment and relative accessibility. Gastric acidity and mucosal cell proliferation are largely regulated by gastrin and enterochromaffin-like (ECL) cells. Chronic overstimulation of these cells has been linked to tumor development, and recent studies suggest that a significant number of gastric adenocarcinomas express neuroendocrine markers, pointing toward a potential ECL cell origin. This insight opens new avenues for both prevention and therapeutic strategies [1]. Gastric cancer (GC) remains a common and deadly malignancy, ranking as the fourth leading cause of cancer-related deaths worldwide. Its development is influenced by a complex interplay of genetic predisposition and environmental factors. The

incidence of GC rises with age, with a median onset of 70 years. Early-onset gastric cancer, occurring in individuals under 45, provides a valuable model for exploring genetic drivers of carcinogenesis, a multistage process that involves sequential mutations and epigenetic alterations [2]. Among the various GC subtypes, diffuse gastric cancer (DGC) stands out as particularly aggressive. Often associated with mutations in genes such as *CDH1* and *RHOA* and with certain hereditary syndromes, DGC exhibits poor prognosis and frequently resists standard therapies. A deeper understanding of its molecular and genetic features is essential to inform screening, diagnostic, and treatment approaches [3].

Recent advances in molecular profiling have revealed distinct gene expression patterns between intestinal and diffuse types of GC. Transcriptomic studies have identified differentially expressed genes, including *AQP9*, *CARD14*, and *CXCR2*, with the latter shown to independently predict overall survival. These findings highlight the importance of moving beyond traditional morphological classifications, which alone are insufficient for guiding individualized therapy [4]. In parallel, genomic technologies, especially next-generation sequencing, have enabled the identification of key genetic alterations, supporting molecular classification, biomarker discovery, and the development of targeted therapeutic strategies [5]. Histological diversity adds another layer of complexity in GC management. Gastric adenocarcinomas with mucinous differentiation can be classified into four main subtypes: pure mucinous, intraductal papillary mucinous, signet ring cell, and mixed types. Each subtype exhibits unique macroscopic features, invasion patterns, lymph node involvement, HER2 expression, and survival outcomes (5-year survival rates: 69.2%, 64.2%, 0%, and 31.5%, respectively) [6]. Studies evaluating HER2 and Ki67 expression further suggest their prognostic relevance, particularly in intestinal-type adenocarcinomas, offering potential guidance for therapeutic decision-making [7]. The integration of artificial intelligence (AI) into digital pathology has transformed GC diagnosis and subtyping. AI can detect subtle histologic changes, resolve challenging diagnostic cases, and accurately score immunohistochemical markers such as HER2 and PD-L1. Moreover, AI-assisted analyses facilitate the identification of novel prognostic biomarkers, including tumor-infiltrating lymphocytes that predict response to immunotherapy, thereby enhancing precision medicine and reducing interobserver variability [8]. In recognition of such advances, the Korean Society of Pathologists recently released an updated standardized pathology report for GC, incorporating molecular biomarkers to improve diagnostic accuracy, prognosis, and facilitate large-scale collaborative research [6].

Recent literature reviews emphasize the evolving landscape of GC therapy. Studies from 2024 highlight surgical strategies combined with immunonutrition, the role of immunotherapy in *Helicobacter pylori* infection, and identification of novel therapeutic targets. Circulating biomarkers, when validated and integrated with AI or conventional diagnostics, may help reduce patient burden and streamline clinical management [9]. Key biomarkers such as PD-L1, HER2, EBV, Claudin 18.2, and FGFR2 are increasingly incorporated into routine clinical practice, supporting personalized treatment approaches that improve outcomes [10].

Attention to rare GC variants is equally important. Subtypes such as papillary, micropapillary, adenosquamous, squamous cell carcinoma, hepatoid, choriocarcinoma, lymphoid stroma, carcinosarcoma, and gastroblastoma, though uncommon, often present overlapping histological features, limited clinical data, and poorly understood pathogenesis. Accurate recognition of these variants is critical for diagnosis, tailored management, and improving patient prognosis, underscoring the need for continued research and comprehensive case reporting [11]. Clinical studies reinforce the importance of precise histopathological evaluation. In a cohort of 67 GC patients, adenocarcinoma was the most common histologic type (91%), frequently presenting at Stage III with poor differentiation. Curative resection was achieved in 75% of cases, with subtotal gastrectomy plus D2 lymphadenectomy yielding the highest R0 resection rate (96.6%). These findings emphasize the value of meticulous pathology and adherence to oncologic principles [12].

Despite significant advances in surgical techniques, molecular profiling, and targeted therapies, gastric cancer continues to carry a high mortality rate. Survival remains unsatisfactory for many patients, highlighting the urgent need for reliable diagnostic and predictive biomarkers. Continued investigation into the molecular mechanisms, histopathological diversity, and therapeutic targets of GC is essential to improve early detection, prognostication, and the development of individualized treatment strategies [12]. Gastric cancer remains one of the major global health challenges and, despite declining incidence in some regions, it continues to rank among the leading causes of cancer-related mortality worldwide [13]. Understanding its molecular and pathological nature is fundamental for improving diagnostic strategies and therapeutic outcomes. Recent advances have highlighted the contribution of genetic and epigenetic alterations, including microsatellite instability (MSI), Epstein–Barr virus (EBV) infection, and Hmlh1 promoter methylation, to the initiation and progression of gastric, cancer [14].

From a pathological perspective, the Laurén classification remains the most widely applied framework, distinguishing gastric cancer into intestinal and diffuse types. This distinction is not only prognostically relevant but also influences patients' responses to chemotherapy [15, 16]. Real-world registry data indicate that patients with the intestinal subtype have improved survival compared to those with the diffuse subtype, underscoring the importance of histopathological stratification in therapeutic decision-making [15]. In parallel, modern research has moved toward integrating traditional histological classifications with molecular subtyping to enhance the precision of treatment strategies [17].
Histopathological characteristics also play a pivotal role in understanding disease behavior. High expression of cadherin-17 has been associated with increased invasiveness and lymph node metastasis [18], while ^18F-FDG PET imaging has shown significant correlations with histological type and tumor differentiation [19]. Moreover, rare variants such as papillary adenocarcinoma [20] and fundic gland-type adenocarcinoma [21] exhibit distinct clinicopathologic features, highlighting the need for refinement of current classification systems.
From the perspective of anatomic involvement, lymph node metastasis remains a critical determinant of staging and surgical strategy. Recent studies have shown that early cardiac gastric carcinomas exhibit a relatively low rate of nodal metastasis, suggesting potential suitability for less invasive surgical approaches [22]. Furthermore, the development of clinicopathologic scoring models has provided clinicians with valuable tools to predict nodal spread in T1 gastric cancer, thereby supporting personalized surgical planning [23].
Collectively, contemporary evidence suggests that the integration of molecular, pathological, and anatomical information offers a promising avenue toward a more comprehensive understanding of gastric cancer. Future research is expected to further align traditional classifications with genomic data and advanced imaging modalities, ultimately paving the way for precision medicine approaches that improve patient outcomes.

2. Materials and Methods

2.1. Definition of the Study Population

In this study, patients with gastric cancer who were hospitalized in the surgical oncology ward of American Hospital Dubai between 2019 and 2024 were included.

2.2. Sample Size, Sampling Method, and Inclusion Criteria

This cross-sectional and retrospective study included all patients during the mentioned period (2019–2024) without randomization, based on a census method. A total of 294 medical records with a primary diagnosis of gastric cancer were reviewed. Among these, 58 cases were excluded due to incorrect initial diagnosis, discharge before completion of medical records, or patient death and incomplete records. Additionally, 60 cases were excluded because of the absence of a pathology report confirming gastric cancer, despite other supporting clinical documents. Ultimately, 176 medical records with a written pathology report confirming the presence of gastric cancer were included in the final analysis.

2.3. Type of Study and Research Method

This was a retrospective cross-sectional study. Following the approval of the proposal, patients were identified in the hospital archives using specific diagnostic codes based on the initial diagnosis of gastric cancer. Data were extracted from medical records according to a checklist, and statistical analysis was performed using SPSS software. The results were reported in the form of tables and charts.

2.4. Data Collection Tools

Data were collected using a checklist. Some minor modifications and additions were made to the original checklist to achieve more accurate results:
In the section on clinical manifestations, dysphagia was assessed as a separate symptom.
The anatomical involvement of the stomach, initially divided into four regions, was reclassified into three anatomical zones for more effective comparison:

Fundus and cardia (proximal stomach)

Body (mid-stomach)

Antrum and pylorus (distal stomach)

Pathology type, which was initially categorized into four groups (intestinal-type adenocarcinoma, diffuse adenocarcinoma, gastric lymphoma, and metastasis), was revised. Due to numerous pathology reports indicating adenocarcinoma without specifying intestinal or diffuse type, an additional group titled unspecified adenocarcinoma was introduced. Furthermore, because of the low frequency of lymphoma and metastasis cases, these were grouped under other types. Ultimately, four pathological categories were analyzed:

Unspecified adenocarcinoma
Diffuse adenocarcinoma
Intestinal-type adenocarcinoma
Other types
In staging, since one case was reported as stage 0, this stage was also considered.

For better comparison, age distribution was classified into four groups: below 40 years, 40–54 years, 55–69 years, and above 69 years.

2.5 Data Analysis Method

Statistical analysis was performed using SPSS software (version 16). The study findings were presented as frequencies and percentages. For assessing the relationship between variables, appropriate statistical tests were applied according to the type of variables, and the presence or absence of statistically significant associations was determined through analytical analysis.

3. Results

In total, 294 medical records with an initial diagnosis of gastric cancer between 2019 and 2024 at American Hospital Dubai were reviewed. Of these, 58 cases were excluded due to incorrect initial diagnosis, discharge before completion of medical records, patient death, or incomplete documentation. Another 60 cases were excluded because no pathology report confirming gastric cancer was available, despite the presence of other supportive clinical data. Finally, 176 medical records with a pathology report confirming gastric cancer were included in the final analysis. The findings presented here are based on these 176 confirmed cases.

3.1. Age Distribution of Patients

The highest frequency of cases was observed in patients over 69 years of age (77 cases). The frequency decreased progressively with younger age groups, with only 5 cases under the age of 40 (Table 1).

Table 1: Age distribution of patients with gastric cancer referred to Hospital during the years 2019-2024.

Age Group (years)	Frequency	Percent (%)	Valid Percent (%)	Cumulative Percent (%)
< 40 years	5	2.8%	2.8%	2.8%
40–54 years	40	22.7%	22.7%	25.6%
55–69 years	54	30.7%	30.7%	56.2%
≥ 70 years	77	43.8%	43.8%	100.0%
Total	176	100.0%	100.0%	

3.2. Gender Distribution

Of the 176 patients, 124 (70.5%) were male and 52 (29.5%) were female.

3.3. Family History of Gastric Cancer

Out of 176 patients, 19 cases reported a positive family history of gastric cancer (first-degree relatives) in first-degree relatives, while 121 cases (86.4%) reported no family history. In 36 cases, no information was available regarding family history, and these were considered as missing data (Table 2).

Table 2: Distribution of family history of gastric cancer in first-degree relatives of patients referred to Hospital (2019–2024).

Family History of Gastric Cancer	Frequency	Percent (%)	Valid Percent (%)	Cumulative Percent (%)
Yes	19	10.8%	13.6%	13.6%
No	121	68.8%	86.4%	100.0%
Total (Valid)	140	79.5%	100.0%	
Missing	***36***	***20.5%***		
Total	176	100.0%		

3.4. Clinical Manifestations at Presentation

Since multiple clinical symptoms were reported in many patients, the distribution of symptoms was as follows:

- Weight loss: 96 cases (54.5%)
- Abdominal pain: 96 cases (54.5%)
- Vomiting: 74 cases (42%)
- Anorexia: 63 cases (35.8%)
- Diarrhea: 8 cases (4.5%)
- Palpable mass: 7 cases (4%)

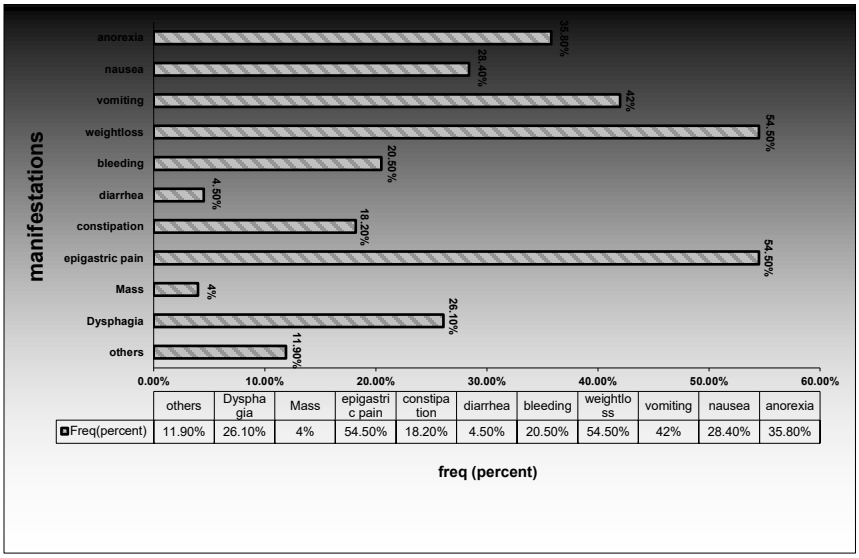

Figure 1: Distribution of clinical manifestations in patients with gastric cancer referred to American Hospital Dubai (2019–2024).

3.5. Anatomical Distribution of Gastric Cancer

Cancer involvement was evaluated across three defined anatomical regions of the stomach:

1. Fundus and cardia (proximal stomach)
2. Body (mid-stomach)

3. Antrum and pylorus (distal stomach)

Some patients had involvement of more than one region. The distribution was as follows:

- Antrum and pylorus (distal stomach): 57 cases (49.6%)
- Fundus and cardia (proximal stomach): 43 cases (37.4%)
- Body (mid-stomach): 10 cases (8.7%)
- More than one region involved: 5 cases (4.3%)

In 61 cases (34.7%), the anatomical site of involvement was not clearly documented and was therefore considered missing data (Table 3).

Table 3: Anatomical distribution of gastric cancer in patients referred to American Hospital Dubai (2019–2024).

Anatomical Site	Frequency	Percent (%)	Valid Percent (%)	Cumulative Percent (%)
Fundus & Cardia (proximal)	43	24.4%	37.4%	37.4%
Body (middle)	10	5.7%	8.7%	46.1%
Antrum & Pylorus (distal)	57	32.4%	49.6%	95.7%
More than one site	5	2.8%	4.3%	100.0%
Total (Valid)	115	65.3%	100.0%	
Missing	***61***	***34.7%***		
Total	176	100.0%		

3.6. Disease Stage at Presentation

Based on medical record documentation, among the 176 hospitalized patients, the most common stage at presentation was stage IV (34 cases, 45.9%). Stages I, II, and III were observed in 18, 13, and 8 cases, respectively. One patient was diagnosed at stage 0. In 102 cases, staging could not be determined due to insufficient information in the medical records, and these were considered missing data (Table 4).

Table 4: Distribution of disease stage in patients with gastric cancer referred to American Hospital Dubai (2019–2024).

Stage	Frequency	Percent (%)	Valid Percent (%)	Cumulative Percent (%)
Stage 0	1	0.6%	1.4%	1.4%
Stage I	8	4.5%	10.8%	12.2%
Stage II	13	7.4%	17.6%	29.7%
Stage III	18	10.2%	24.3%	54.1%
Stage IV	34	19.3%	45.9%	100.0%
Total (Valid)	74	42.0%	100.0%	
Missing	***102***	***58.0%***		
Total	176	100.0%		

3.7. Pathological Types of Gastric Cancer

The most frequent pathological type was adenocarcinoma. However, in 81 cases (46%), the pathology report did not specify whether it was intestinal or diffuse type, and these were categorized as unspecified adenocarcinoma. In addition, 42 cases (23.9%) were reported as intestinal-type adenocarcinoma, 41 cases (23.3%) as diffuse adenocarcinoma, and 12 cases (6.8%) as other tumors. The “other” category included 5 secondary metastases, 3 lymphomas, 2 carcinomas, and 2 rare malignant tumors (Table 5).

Table 5: Distribution of pathological types of gastric cancer in patients referred to American Hospital Dubai (2019–2024)

Pathologic Type	Frequency	Percent (%)	Valid Percent (%)	Cumulative Percent (%)
Intestinal-type Adenocarcinoma	42	23.9%	23.9%	23.9%
Diffuse-type Adenocarcinoma	41	23.3%	23.3%	47.2%
Others	12	6.8%	6.8%	54.0%
Adenocarcinoma (unspecified)	81	46.0%	46.0%	100.0%

Total	176	100.0%	100.0%	

3.8. Additional Findings

Although not primary study objectives, several related indicators and associations between variables were analyzed:

- Chief Complaints at Presentation: Only one main symptom was considered per patient. The most common chief complaints were abdominal pain (37.5%), dysphagia (17.6%), bleeding (9.6%), and nausea or anorexia (9.6% each). The least frequent were diarrhea, constipation, and palpable mass, each with 1.4%. (Specified in figure 2).

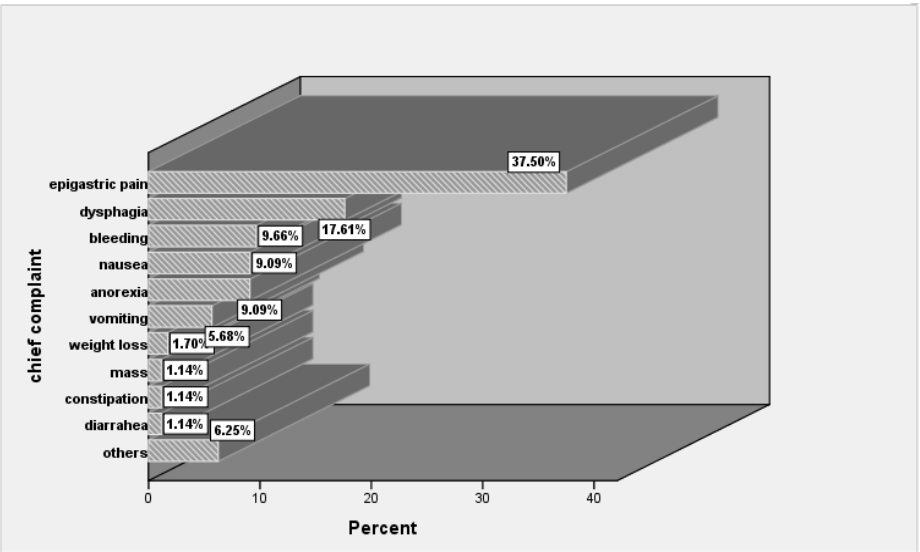

Figure 2: Distribution of chief complaints in patients with gastric cancer referred to American Hospital Dubai (2019–2024).

3.9. Age Distribution by Gender

In men, the frequency of gastric cancer increased steadily with advancing age. In women, the highest frequency was in those over 69 years (42.3%), followed by 40–54 years (28.8%) and 55–69 years (21.2%). Overall, the age distribution by gender followed a normal pattern (Table 6, Figure 3).

Table 6: Age distribution by sex of patients with gastric cancer referred to American Hospital Dubai (2019–2024).

Age Group	Male Frequency	Male Percent (%)	Female Frequency	Female Percent (%)
<40 years	1	0.8%	4	7.7%
40–54 years	25	20.2%	15	28.8%
55–69 years	43	34.7%	11	21.2%
>69 years	55	44.4%	22	42.3%
Total	124	100.0%	52	100.0%

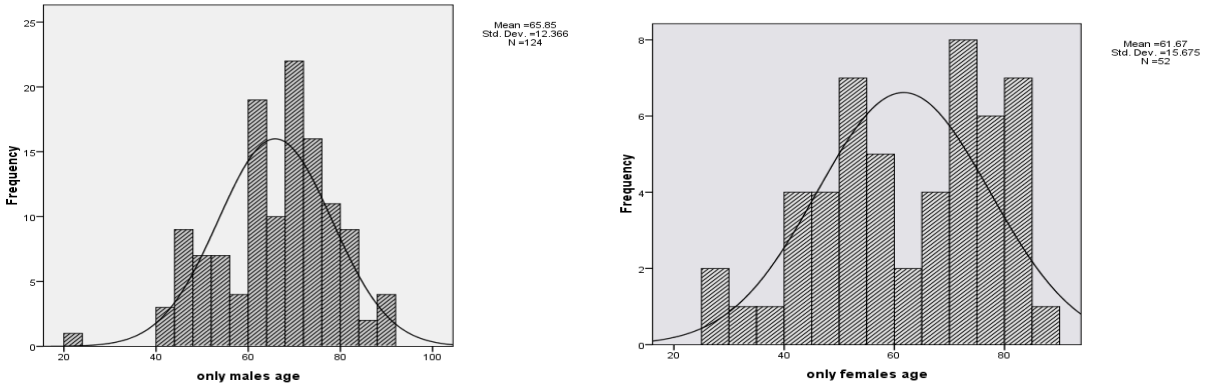

Figure 3: Age distribution by sex of patients with gastric cancer referred to American Hospital Dubai (2019–2024).

3.10. Age Distribution by Pathological Subtype

- For intestinal-type adenocarcinoma, the highest frequency was observed in patients over 69 years (42.9%), with progressively lower frequencies in younger age groups.
- For diffuse adenocarcinoma, the highest frequency was in the 40–54-year age group (34.1%), while the lowest was in patients under 40 years. (Table 7)

Table 7: Age distribution by pathological type of gastric cancer in patients referred to American Hospital Dubai (2019–2024).

Pathologic Type	Age Group	Frequency	Percent (%)	Valid Percent (%)	Cumulative Percent (%)
Intestinal-type Adenocarcinoma	40–54 years	10	23.8%	23.8%	23.8%
	55–69 years	14	33.3%	33.3%	57.1%
	>69 years	18	42.9%	42.9%	100.0%
Total		42	100.0%	100.0%	
Diffuse-type Adenocarcinoma	<40 years	3	7.3%	7.3%	7.3%
	40–54 years	14	34.1%	34.1%	41.5%
	55–69 years	12	29.3%	29.3%	70.7%
	>69 years	12	29.3%	29.3%	100.0%
Total		41	100.0%	100.0%	
Others	<40 years	2	16.7%	16.7%	16.7%
	55–69 years	3	25.0%	25.0%	41.7%
	>69 years	7	58.3%	58.3%	100.0%
Total		12	100.0%	100.0%	
Adenocarcinoma (unspecified)	40–54 years	16	19.8%	19.8%	19.8%
	55–69 years	25	30.9%	30.9%	50.6%
	>69 years	40	49.4%	49.4%	100.0%
Total		81	100.0%	100.0%	

4. Conclusion

Although gastric cancer can occur at younger ages in high-incidence countries, it is generally considered a disease of older adults. In the present study, the largest proportion of patients was in the age group over 69 years (43.8%), with a mean age of 64.61 years overall. The mean age was 65.85 years in men and 61.67 years in women. Globally, gastric cancer shows a male predominance. In this study, the male-to-female ratio was consistent with international data. According to published reports, early-stage gastric cancer is often asymptomatic, while patients presenting at advanced stages (stage III–IV) commonly report weight loss, anorexia, early satiety, abdominal pain, nausea, bloating, and dysphagia (particularly in cardia involvement). In this study, the five most common clinical manifestations were:

- Weight loss and abdominal pain (54.5%)

- Vomiting (42%)
- Anorexia (35.8%)
- Nausea (28.4%)
- Dysphagia (26.1%)

In this study gastric cancer is typically distributed as follows:

- Fundus and cardia (proximal): 37.1%
- Body (middle): 8.6%
- Antrum and pylorus (distal): 49.1%
- More than one site: 4.3%

Thus, the most frequent anatomical site in this study was the distal stomach, in contrast to developed countries where proximal tumors are more common.
In our study the most common stage at diagnosis was stage IV (45.9%), followed by stage III (24.3%). Although the global incidence of intestinal- and diffuse-type adenocarcinoma is approaching similar proportions, the intestinal type remains predominant in high-incidence regions. In our study, however, the proportions of intestinal adenocarcinoma (23.9%) and diffuse adenocarcinoma (23.3%) were very similar, while unspecified adenocarcinoma accounted for 46%, and other tumors for 6.8%.
Globally, intestinal-type adenocarcinoma is more common in older age groups, whereas diffuse-type adenocarcinoma tends to affect younger patients. In our study:

- For intestinal-type adenocarcinoma, the highest frequency was observed in patients over 69 years (42.9%).
- For diffuse-type adenocarcinoma, the highest frequency was in the 40–54 years age group (34.1%), followed by the 55–69 and >69 age groups (29.3%). The lowest frequency was in patients under 40 years (7.3%).

Analytical results demonstrated a statistically significant association between diffuse adenocarcinoma and the 40–54 years group ($p = 0.046$) as well as the over-69 group ($p = 0.03$). No significant association was found between intestinal adenocarcinoma and age groups.

Compared with international data, several major findings can be highlighted:

- The mean age of patients in this study was lower than in developed countries, and women had a lower mean age than men, contrary to trends observed in Western countries.
- The distal stomach (antrum and pylorus) was the most common anatomical site of involvement, while in developed countries, proximal tumors predominate.
- The frequencies of intestinal- and diffuse-type adenocarcinoma were very close, resembling patterns in low-incidence countries, despite UAE being considered a high-incidence region.

Other findings were in line with international data:

- Male predominance of gastric cancer.
- Common clinical manifestations (weight loss, abdominal pain, vomiting, anorexia, nausea, dysphagia).
- Advanced stage (III and IV) as the most common stage at presentation.
- Greater tendency of diffuse adenocarcinoma to occur in younger age groups.

This study was conducted in a single hospital, which may limit generalization of the results.

References

1. Waldum, H., & Mjønes, P. (2020). Towards understanding of gastric cancer based upon physiological role of gastrin and ECL cells. Cancers, 12(11), 3477.

2. Machlowska, J., Baj, J., Sitarz, M., Maciejewski, R., & Sitarz, R. (2020). Gastric cancer: epidemiology, risk factors, classification, genomic characteristics and treatment strategies. International Journal of Molecular Sciences, 21(11), 4012.

3. Iyer, P., Moslim, M., Farma, J. M., & Denlinger, C. S. (2020). Diffuse gastric cancer: histologic, molecular, and genetic basis of disease. Translational Gastroenterology and Hepatology, 5, 52.

4. Carino, A., Graziosi, L., Marchianò, S., Biagioli, M., Marino, E., Sepe, V., Zampella, A., Distrutti, E., Donini, A., & Fiorucci, S. (2021). Analysis of gastric cancer transcriptome allows the identification of histotype specific molecular signatures with prognostic potential. Frontiers in Oncology, 11, 663771.

5. Kim, M., & Seo, A. N. (2022). Molecular pathology of gastric cancer. Journal of Gastric Cancer, 22(4), 273.

6. Park, Y. S., Kook, M.-C., Kim, B., Lee, H. S., Kang, D.-W., Gu, M.-J., Shin, O. R., Choi, Y., Lee, W., & Kim, H. (2023). A standardized pathology report for gastric cancer. Journal of Pathology and Translational Medicine, 57(1), 1–27.

7. Andronic, M., Scripcariu, D.-V., Palaghia, M. M., Trofin, A.-M., Bejan, V., & Scripcariu, V. (2024). Clinical Pathological and Immunohistochemical Correlations in Gastric Cancer. Diagnostics, 14(13), 1367.

8. Choi, S., & Kim, S. (2023). Artificial intelligence in the pathology of gastric cancer. Journal of Gastric Cancer, 23(3), 410.

9. Burz, C., Pop, V., Silaghi, C., Lupan, I., & Samasca, G. (2024). Prognosis and treatment of gastric cancer: a 2024 update. Cancers, 16(9), 1708.

10. Nishimuni, M., Claro, L. C. L., & Braghiroli, M. I. F. M. (2024). Advancements and challenges in gastric cancer: epidemiology, biomarkers, and therapeutic strategies. Surgical and Experimental Pathology, 7(1), 19.

11. Shin, J., & Park, Y. S. (2023). Unusual or uncommon histology of gastric cancer. Journal of Gastric Cancer, 24(1), 69.

12. Prodan-Bărbulescu, C., Faur, F. I., Varga, N.-I., Hajjar, R., Pașca, P., Ghenciu, L.-A., Feier, C. I. V., Dema, A., Fărcuț, N., & Bolintineanu, S. (2025). A Histopathological and Surgical Analysis of Gastric Cancer: A Two-Year Experience in a Single Center. Cancers, 17(13), 2219.

13. Tan, P., & Yeoh, K.-G. (2015). Genetics and molecular pathogenesis of gastric adenocarcinoma. Gastroenterology, 149(5), 1153–1162.

14. Guo, Z.-N., Sun, X., Liu, J., Sun, H., Zhao, Y., Ma, H., Xu, B., Wang, Z., Li, C., & Yan, X. (2018). The impact of variational primary collaterals on cerebral autoregulation. Frontiers in Physiology, 9, 759.

15. Jiménez Fonseca, P., Carmona-Bayonas, A., Hernández, R., Custodio, A., Cano, J. M., Lacalle, A., Echavarria, I., Macias, I., Mangas, M., & Visa, L. (2017). Lauren subtypes of advanced gastric cancer influence survival and response to chemotherapy: real-world data from the AGAMENON National Cancer Registry. British Journal of Cancer, 117(6), 775–782.

16. Kiba, T., Morii, N., Takahashi, H., Ozaki, S., Atsumi, M., Masumoto, F., & Yamashiro, H. (2016). Pathological complete response rate in hormone receptor-negative breast cancer treated with neoadjuvant FEC, followed by weekly paclitaxel administration: A retrospective study and review of the literature. Oncology Letters, 11(5), 3064–3070.

17. Romano, E., Rufo, N., Korf, H., Mathieu, C., Garg, A. D., & Agostinis, P. (2018). BNIP3 modulates the interface between B16-F10 melanoma cells and immune cells. Oncotarget, 9(25), 17631.

18. Long, Z.-W., Zhou, M.-L., Fu, J.-W., Chu, X.-Q., & Wang, Y.-N. (2015). Association between cadherin-17 expression and pathological characteristics of gastric cancer: a meta-analysis. World Journal of Gastroenterology: WJG, 21(12), 3694.

19. Kim, H. W., Won, K. S., Song, B.-I., & Kang, Y. N. (2015). Correlation of primary tumor FDG uptake with histopathologic features of advanced gastric cancer. Nuclear Medicine and Molecular Imaging, 49(2), 135–142.

20. Arai, T., Komatsu, A., Kanazawa, N., Nonaka, K., & Ishiwata, T. (2023). Clinicopathological and molecular characteristics of gastric papillary adenocarcinoma. Pathology International, 73(8), 358–366.

21. Jiang, C., Zhu, J., Zhou, P., Zhu, H., Wang, W., Jin, Q., & Li, P. (2018). Overexpression of FIBCD1 is predictive of poor prognosis in gastric cancer. American Journal of Clinical Pathology, 149(6), 474–483.

22. Lee, J. Y., Chang, H.-S., Kim, T. H., Chung, E. J., Park, H. W., Lee, J.-S., Lee, S. M., Yang, D.-H., Choe, J., & Byeon, J.-S. (2019). Association between cigarette smoking and alcohol consumption and sessile serrated polyps in subjects 30 to 49 years old. Clinical Gastroenterology and Hepatology, 17(8), 1551–1560.

23. Martins, M. R., Santos, R. L. d, Jatahy, K. d N., Matta, M. C. d, Batista, T. P., Júnior, J. I. C., Begnami, M. D. F. S., & Torres, L. C. (2018). Could OX40 agonist antibody promote activation of the anti-tumor immune response in gastric cancer? Journal of Surgical Oncology, 117(5), 840–844.