

Research Article

The Prevalence of Upper Gastrointestinal Malignancies Among Patients Undergoing Upper Gastrointestinal Endoscopy at Jiblah University Hospital and Al-Matary Medical Center in Ibb Governorate, Yemen

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Abstract:

Background: Upper gastrointestinal tract malignancies constitute a major health problem globally. There is a paucity of published data regarding upper gastrointestinal tract malignancy in Yemen. This study aimed to assess prevalence of upper gastrointestinal tract malignancy among patients undergoing upper gastrointestinal tract endoscopy done in Jiblah University Hospital and Almatary Medical Centre in Ibb Governorate, Yemen.

Methods: A retrospective study was conducted by reviewing the complete records of 21148 patients who underwent upper gastrointestinal endoscopic evaluation between December 2005 and December 2023. Data were analyzed using SPSS version 26. Chi-square test was used to compare variables, with statistical significance set at $P < 0.05$.

Results: Of 2148 patients who underwent endoscopic evaluation of the upper GI tract, 259 (12.1%) had upper gastrointestinal tract malignancies. The mean age of the patients was 64.98 years. Males represented 156 (60.2%) of the patients with upper gastrointestinal tract. Esophageal tumor was the most common tumor among the 100 (38.61%) upper GI gastrointestinal tract and was prevalent in male patients in their fifth decade of life. Adenocarcinoma 64 (69.6%) in this study was found more frequently in the age group 65-79 years with a male predominance.

Conclusion: Upper gastrointestinal tract malignancies remain a public health issue in Yemen and need urgent intervention from health authorities due to the increasing incidence of gastrointestinal malignancies in Yemen.

Keywords: Esophageal tumor, Gastrointestinal malignancy, Jiblah, Yemen.

Introduction

Cancer is a generic term for a large group of diseases that can affect any part of the body. Cancer is a scary non-communicable disease and considered as a major societal, economic and public health (1) and it is one of the top three causes of death worldwide (2). According to WHO, the incidence of cancer will be higher than the rate of coronary heart disease and stroke by 2025 and is expected to double by 2040. Globally, there have been more than 50 million cancer cases, with around 20 million new cases and 10 million deaths from cancer (2). Long-term projections indicate that by 2030, there will be a 1.8-fold increase in cancer incidence (3). This increase will be higher in developing countries compared to developed countries (4). Gastrointestinal (GI) cancers are responsible for more cancer deaths than any other cancers (1). For European citizens, GI cancers represent a significant burden and account for a quarter of all malignancies diagnosed in Europe. An estimated 600,000 cases of GI and 360,000 associated with deaths occur annually in Europe (5). Globally, upper gastrointestinal cancer (UGIC) is the third most common

cancer worldwide and the second leading cause of death among all cancers (6.8% of all cancer cases) and represents a significant burden. More than 70% of cases occurred in developing countries, and about half of the global total occurred in East Asia (6). Upper gastrointestinal cancers (UGICs) include esophageal cancer, gastro-esophageal cancer, stomach cancer, small bowel cancer, pancreatic cancer, liver cancer and cancers of the biliary system. In 2018, over 1.5 million cases of esophageal and gastric cancers and 1,290,000 deaths worldwide (7) in 2020, gastric cancers stated as the 5th most common cancer and the 4th leading cause of cancer death globally (8). In 2018, there were more than 1.5 million cases of esophageal and gastric cancer and 1,290,000 deaths worldwide (6,7) and in 2020, gastric cancer was ranked as the fifth most common cancer and the fourth leading cause of cancer death worldwide (8). Globally, esophageal cancer is the eighth most commonly diagnosed cancer and the sixth leading cause of death. About 80% of all cases occur in developing countries (9). Yemen is classified as a lower-middle-income economy according to the World Bank classification (10). Cancer is a major public health

issue in Yemen. In 2020, the Global Cancer Project (GCP) reported that the crude incidence rate (CIR) for all cancers in Yemen was 55.2 per 100,000, while the global CIR for all cancers was 40.6/100,000 (11). Approximately 35,000 Yemenis are currently diagnosed with cancer, with over 11,000 new diagnoses annually. Several studies conducted in Yemen have found that the most common type of cancer is gastrointestinal (GI) cancer, with stomach cancer (7.1%), esophageal cancer (6.4%), and liver cancer (5.1%) accounting for all cancers reported in Yemen (13). Despite having five national cancer registry centers, Yemen suffers from scarcity of data and poor quality of medical records. Cancer registry centers in Yemen often suffer from a lack of qualified workforce, inadequate health services, lack of funding, and inaccurate data due to incomplete coverage, difficulty in obtaining cancer mortality data, and reasonable cancer registries in the country. Ibb Governorate in Yemen is one of the most densely populated governorates outside the Yemeni capital, Sana'a. Studies on the distribution of malignant tumors in general, and on upper gastrointestinal tumors in particular, have been scarce and insufficient. Therefore, the aim of the current study is to give a clearer view on the prevalence of upper gastrointestinal tract (UGIT) tumors among patients who underwent upper gastrointestinal endoscopy in order to help health authors develop a plan to deal with this major health problem.

Methods

This was a retrospective observational study conducted at JUH and AMC during the period from December 2005 to December 2023. A total of 2148 patients (1218 from JUH and 930 from AMC) underwent upper GIT endoscopy enrolled in the study and performed by the same surgeon. This study was approved by JUH and AMC Director. To secure patient identities, patient record numbers were used instead of patient names. Data on patient gender, age, clinical presentation, tumor location, and histopathology reports were obtained from patient records from the study site.

Statistical Analysis

Data were entered into Microsoft Excel 2010 and analysis was performed using SPSS version 26. Differences between variables related to demographic characteristics were analyzed using Chi-square tests and *P* value < 0.05 was considered as statistical significance level.

Results

A total of 2148 patients who underwent upper GIT endoscopy were enrolled in this study, with an age range of 26 to 95 years, with a mean of 64.98 years (SD = ± 13.8). Among them 1109 (51.63%) were females and 1039 (48.37%) were males.

The main indications for upper GIT endoscopy were epigastric pain 806 (37.52%), dysphagia 545 (25.37%) and repeated vomiting 247 (11.50%). Other reported indications included hematemesis, retrosternal pain, melena, foreign bodies, and hiccough (Table 1).

Table 1. Distribution of subjects according to gender and indications of upper GIT endoscopy (n=2148)

Variable	No. of the cases	Percentage
Gender		
Female	1109	51.63
Male	1039	48.37
Indications		
Epigastric pain	806	37.52 %
Dysphagia	545	25.37 %
Repeated vomiting	247	11.50 %
Retrosternal pain	224	10.43%
hematemesis	233	10.85 %
Melena	62	2.89%
Foreign bodies	19	0.88 %
Hiccough	12	0.59 %

Of 2148 of target population, 259 (12.06%) were found to have UGIT malignant tumors (Figure 1).

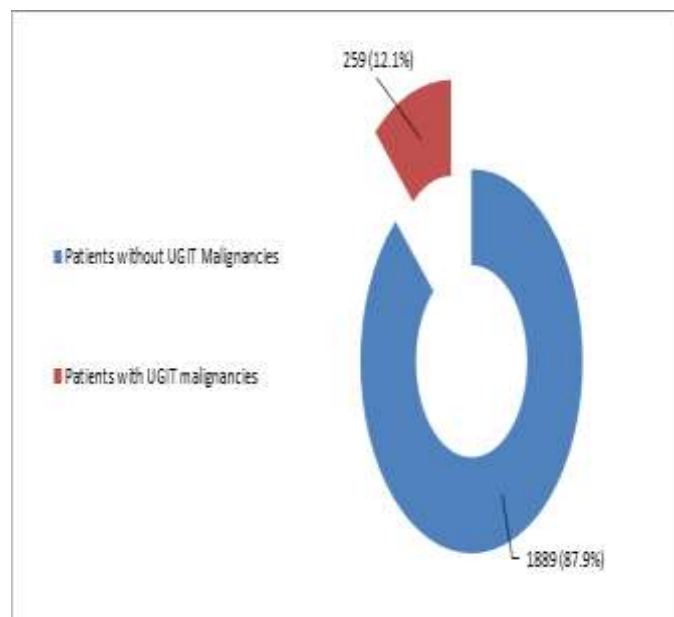


Figure 1. Prevalence of UGIT malignancies among target patients

Most of them were males 156 (60.2%) and 103 (39.8%) were females. The current study showed that esophageal tumor, gastric tumor, and gastro-esophageal tumor were more prevalent in males than in females. A strong association was reported between gender and esophageal tumor and gastro-esophageal tumor (*P* < 0.016) and (*P* < 0.000), respectively. While no statistical association was detected between gender and gastric tumor (*P* < 0.292). The present study revealed a statistically significant association between age and esophageal tumor and gastro-esophageal tumor (*P* < 0.009) where 43 (52.4%) patients aged 50–64 years had esophageal tumor and 4 (66.7%) of the target population aged 20–34 years had gastro-esophageal tumor. On the other hand, there was no association between age and gastric tumor (*P* < 0.849) (Table 2).

Table 2. The relationship between demographic factors and location of UGIT malignant tumors (n=259)

*A p-value of < 0.05 was considered statistically significant.

Variable	No. (%)	Esophageal tumor		*P- value	Gastro-esophageal tumor		*P- value	Gastric tumor		*P value
		Yes	NO		Yes	NO		Yes	NO	
		No. (%) (%)	No. (%) (%)		No. (%) (%)	No. (%) (%)		No. (%) (%)	No. (%) (%)	
Gender				0.016			0.000			0.292
Female	103 (39.77)	49 (47.6)	54 (52.4)		20 (19.4)	83 (80.6)		34 (33)	69 (67)	
Male	156 (60.23)	51 (32.7)	105 (67.30)		63 (40.4)	93 (59.6)		42 (26.9)	114 (73.1)	
Age (years)				0.009			0.009			0.849
20-34	6 (2.3)	0 (0.0)	6 (2.3)		4 (66.7)	2 (33.3)		2 (33.3)	4 (66.7)	
35-49	26 (10)	8 (30.8)	18 (69.2)		8 (30.8)	18 (69.2)		10 (38.5)	16 (61.5)	
50-64	82 (31.7)	43 (52.4)	39 (47.6)		16 (19.5)	66 (80.5)		23 (28)	59 (72)	
65-79	92 (35.5)	34 (37)	58 (63)		31 (33.7)	61 (66.3)		27 (29.3)	65 (70.7)	
=80	53 (20.5)	15 (28.3)	38 (71.7)		24 (45.3)	29 (54.7)		14 (26.4)	39 (73.6)	

Regarding the anatomical location, esophageal tumor accounted for 100 cases (38.6%) of the cases. While gastro-esophageal and gastric cancer accounted for 83 cases (32.1%) and 76 cases (29.3%), respectively (Figure 2).

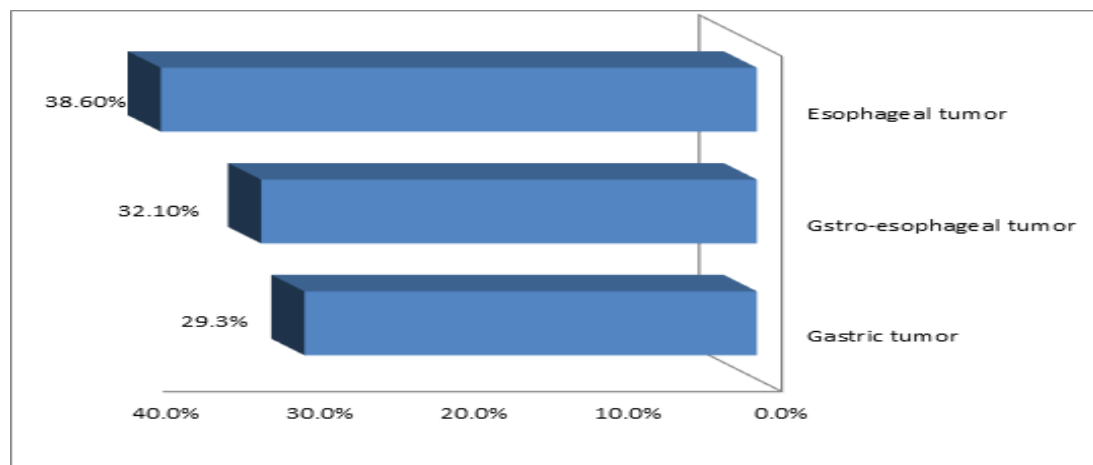


Figure 2: Distribution of UGIT malignancies according to the anatomical location

Figure 2: Location of UGIT cancer related to the gender of the patients مكرر

According to histopathological finding, out of 295 patient had UGIT malignancies, 160 (61.8 %) had Adenocarcinoma, 96 (37.1 %) had Squamous cell carcinoma and only 3 (1.1%) had Lymphoma (Figure 3). There was no significance correlation between histopathological reports and gender of the target population. There was an association between Lymphoma and age ($P < 0.002$) in which age group 20-34 years representing highest percentage 1 (16.7%) of patients who had lymphoma (Table 3).

Table 3. Association between histological type of UGIT malignancies and gender and age of target patients (n=259)

*A p-value of < 0.05 was considered statistically significant.

Variable	No. (%)	Adenocarcinoma		*P- value	Squamous cell carcinoma		*P- value	Lymphoma		*P value
		Yes	NO		Yes	NO		Yes	NO	
		No. (%) (%)	No. (%) (%)		No. (%) (%)	No. (%) (%)		No. (%) (%)	No. (%) (%)	
Gender				0.083			0.073			0.819
Female	103 (39.77)	57 (55.3)	46 (44.7)		45 (43.7)	58 (56.3)		1 (0.97)	102 (99.03)	
Male	156 (60.23)	103 (66.03)	53 (33.97)		51 (32.7)	105 (67.3)		2 (1.3)	154 (98.7)	
Age (years)				0.098			0.061			0.002
20-34	6 (2.3)	4 (66.7)	2 (33.3)		1 (16.7)	5 (83.3)		1 (16.7)	5 (83.3)	
35-49	26 (10)	14 (53.8)	12 (46.2)		11 (42.3)	15 (57.7)		1 (3.85)	25 (96.15)	
50-64	82 (31.7)	42 (51.2)	40 (48.8)		40 (48.8)	42 (51.2)		0 (0.0)	82 (100)	
65-79	92 (35.5)	64 (69.6)	28 (30.4)		28 (30.4)	64 (69.6)		0 (0.0)	92 (100)	
=80	53 (20.5)	36 (67.9)	17 (32.1)		16 (30.2)	37 (69.8)		1 (1.9)	52 (98.1)	

Discussion

UGIT malignancies constitute a significant issue globally (7). Malignant tumors of the UGIT account for 13,300 deaths and around 16,600 new cases each year in the UK (13). Esophageal and gastric cancers are most common in developing countries (14). One of the customs and traditions in Yemen is chewing Qat, as most Yemenis chew Qat daily and smoke cigarettes and/or water pipe during Qat chewing sessions. Chewing Qat, smoking, and using sniff are considered direct and indirect risks for contracting various types of cancer, including UGIT malignancy. Qat farmers are known to use various types of pesticides, and both they and Qat consumers are exposed to various chemicals that may increase the risk of UGIT malignancies. The knowledge about the malignancies in Yemen is still poor, and there is a paucity of published data regarding UGIT. Ibb governorate in Yemen is considered one of the most populous governorates. To our knowledge, this was the first study which revealed the distribution of UGIT malignancies in Ibb Governorate, Yemen. The current study indicated that the incidence rate of UGIT malignancies was 12% of the targeted patients, which is lower than the studies conducted in Uganda 34.5% (15), China 19.8% (16) Sudan 21.1% (17), Iran 13.4% (18), and all regions of Yemen 31.2% (19). On the other hand, the result of this study was higher than the studies conducted in Sudan 7.47% (20), Libya 0.20% (21) and in Aden, Yemen 4.2% (22). This discrepancy between our study and other studies may be related to the customs and traditions of each target population group for the study and may also be due to the study design, research methods, and sample size. The mean age of the participants was 64.98 ± 13.8 years. Among the 912 (12%) patients who had UGIT malignancy, most of them 35.5% were aged 65–79 years. Previous studies conducted in Uganda (15), Nepal (1), United Kingdom (13) and Saudi Arabia (23) reported similar findings to the present study.

With regard to the anatomical location, esophageal tumor was slightly predominant 38.6% than gastro-esophageal and gastric cancer 32.1% and 29.3%, respectively. These findings are consistent with studies conducted in Ethiopia (24), China (6), India (25) and in Yemen (19). While they are not consistent with the results of the study conducted in Oman, where gastric tumor is the most common cancer among males in Oman and the second most frequent among females from 1997 to 2007 (26). The present study reported that esophageal tumor was most commonly reported between the ages of 50–64 years with a male predominance and a significant association between age and esophageal tumor ($P < 0.009$). In case of gastro-esophageal tumor, it was observed between the ages of 20–34 years with a male predominance and a strong association was detected ($P < 0.009$). However, gastric tumor was observed in the age group of 35–49 years and no association was identified ($P < 0.849$). This finding was similar to study conducted in UK (13). In this study, about 60.2% of UGIT malignant cases were males. This result is consistent with studies conducted in China (16), Nepal (1), Iran (18) and Yemen (19). The reasons for these differences may be that males were more likely to chew Qat,

smoke tobacco products, and use sniff than females. On the other hand, the gender differences may reflect physiological differences. Estrogen hormones may protect against the development of UGIT malignancy.

The most common indications for UGI endoscopy were epigastric pain 37.52%, dysphagia 25.37% and repeated vomiting 11.50%, hematemesis 10.85% and other indications 25.61%. Similar studies conducted in Uganda and Yemen (22,27). Other studies in Ethiopia and Ghana have shown that dyspepsia is the most common indication in patients undergoing UGI endoscopy (15, 24)

Regarding to the most common histological morphology, adenocarcinoma was found to be 61.8% followed by Squamous cell carcinoma at 37.1%. These results were consistent with other studies conducted in Nepal (1), Nigeria, (28) and in Yemen (19, 27). However, Squamous cell carcinoma was noticeably the commonest type in Sudan (29). Adenocarcinoma and Lymphoma were found to be more frequent in males at 66.03% and 1.3%, respectively. While Squamous cell carcinoma occurred predominantly in females 63.6%, compared to males 43.7%, no statistically significant difference was detected. Furthermore, Adenocarcinoma was evenly distributed over the different age groups with a peak at age group 65–79 years, while Squamous cell carcinoma was most frequently reported among the age group 50–64 years. No statistical significance was detected. In case of Lymphoma, it was reported more frequently in the age group 20–34 years. A statistically significant difference was detected ($P < 0.002$).

This study had its limitations. It was a retrospective study with no follow-ups. Clinical presentation, clinical outcomes and other data of UGIT malignancies were not studied. The results of this study reflects the findings of a specific geographical area which may not be a true representation of the burden of UGIT malignancies.

Conclusion

The commonest UGIT malignancies in the current study was esophageal tumor and it followed by gastro-esophageal and gastric malignancies with a male predominance. Esophageal tumor tended to occur in the age group 50–64 years. Adenocarcinoma and squamous cell carcinoma were the most frequent types. Future studies are required to identify UGIT malignancies in Yemen to help the health policy makers to develop a plan to manage a major event that cause significant morbidity and mortality in the community.

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Author's Contribution: Almatary AM planned, compiled, wrote and supervised the final paper. Al-Herar MA contributed to data collection and analysis. The authors read and approved the final version for submission to this journal.

Data Availability

Data will be made available on request.

Conflict of Interest


The authors declare no competing interests.

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