Risk Factors and Clinicopathological Characteristics among Patients with Gastric Cancer in Oncology Teaching Hospital

Sherin Ali Hussein*, Azher Sabeh. Alzubaidi**

ABSTRACT:

BACKGROUND:
Gastric cancer is a rare tumor and one of the leading causes of death worldwide, unfortunately most of patient present late.

PATIENTS AND METHODS:
Case -control study conducted on patients affected with gastric cancer presented to oncology teaching hospital. Data regarding their family history of gastric cancer, smoking and blood group were collected for patients and for participants in Control group matching in respect to age, sex, number and geographical area.

OBJECTIVE:
Assess the most important risk factors of gastric cancer Assess clinicpathologic and their histological subtypes

RESULT:
77 patients with stomach cancer and 77 control participants their age range from 27 up to 74. Mean age (SD) of (54 ± 13.8 and 55.1 ±13 years) respectively. A significant association between smoking and gastric cancer (62.3%) of index group compared to (39%) in control   (p=0.002). also a significant association between First degree family history of stomach cancer was found in 11.7% in index group compared to (0%) in control (p= 0.001). The most frequent site for cancer was antrum 31.1% of cases. diffuse subtype of adenocarcinoma(50.6%). Stage IV formed the majority of patients (62.4%).

CONCLUSION:
Smoking and family history of first degree relative have strong association with gastric cancer. Majority of patients present at advanced stage 4 and diffuse type of adenocarcinoma. Antrum is the most affected part of the stomach.

KEY WORDS: Gastric cancer, Histology subtypes.

INTRODUCTION:

Overview
Gastric cancer was the leading cause of cancer-related death worldwide through most of the 20th century. It Now ranks second only to lung cancer; an estimated 952,000 new cases are diagnosed annually, and an estimated 723,000 deaths (10% of all cancer deaths) worldwide [1].

Although gastric cancer rates have experienced a significant decline in incidence worldwide, it is still prevalent in regions of the world where the storage of fresh foods and the quality of water are poor and in some industrialized nations as well

* Oncology Department, Al-Yarmouk Teaching Hospital, Baghdad-Iraq
**Baghdad Teaching Hospital, Baghdad, Iraq

(e.g., Japan)[5]. Gastric cancer is a major health issue in both Japan and Korea.[2]

The incidence of gastric cancer in west has decreased, potentially because of changes in diet, food preparation, and other environmental factors. The decline in incidence has been limited to noncardia gastric cancers and intestinal type.[3]

Histopathology
Approximately 95% of all gastric cancer are adenocarcinoma. Other malignant tumor are rare and include squamous cell carcinoma, adenocanthoma, carcinoid, small cell carcinoma, mucinous carcinoma, hepatoid adenocarcinoma, sarcomatoid carcinoma, lymphoepithelioma-like carcinoma, neuroendocrine tumor, gastrointestinal stromal tumor or leiomyosarcoma.[4]

Several classification systems have been proposed, including Ming in 1926, Carniero, and Goseki [5]. But the most commonly used are those of WHO and Laurén classifications [6,7] . Lauren divides gastric cancers into either intestinal or diffuse forms, this classification scheme, based on tumor histology, characterizes two varieties of gastric adenocarcinomas that manifest distinctively different pathology, epidemiology, genetics, and etiologies [8]

Tumor locations: Common tumor location;[9]
- Distal location including (antrum, pylorus) 40%
- Proximal location including (cardia which is 2.5 cm from gastroesophageal junction, fundus) 35%

Body (lesser curvature, larger curvature) 25%

Clinical presentation

Because of the vague, nonspecific symptoms that characterize gastric cancer, many patients are diagnosed with advanced-stage disease[10].

1. Patients may have a combination of signs and symptoms such as weight loss and gastrointestinal blood loss (22% to 61%)
2. Anorexia (5% to 40%); fatigue, epigastric discomfort.
3. Pain (62% to 91%); and postprandial fullness, heart burn, indigestion, nausea, and vomiting (6% to 40%). None of these unequivocally indicates gastric cancer. In addition, patients may be asymptomatic (4% to 17%).
4. Up to 25% has history /symptoms of peptic ulcer disease.

Factors associated with increased risk of gastric cancer

- Diet; Gastric cancer has been linked to the ingestion of red meats, cabbage, spices, fish, salt-preserved , smoked foods and a high carbohydrate diet [9].
- H. pylori infection is associated with an increased risk for gastric adenocarcinoma and may be a cofactor in the pathogenesis of noncardiac gastric cancer [9].
- Heredity& race Asian& African and Hispanic American have higher risk of gastric cancer than whites.
- Previous gastric resection [9].
- Gastric polyps. Patients with familial adenomatous polyposis (FAP) have a higher incidence of gastric cancer [9].

- Gastric cancer is more common in men older than 50 years of age and in people with blood group A [9]. Gastric cancer is consistently seen more of lower socioeconomic class across the world [9].

Diagnostic tools

Endoscopy: Is the best method to diagnose gastric cancer as it visualizes the gastric mucosa and allows biopsy for histologic diagnosis [11]

Computed tomography: Multidetecter and a triphasic CT with oral and intravenous contrast of abdomen, chest and pelvis.

FDG-PET alone is not an adequate diagnostic procedure in the detection and preoperative staging of gastric cancer, but can be helpful when used in conjunction with CT [12].

Tumor marker; have limited diagnostic usefulness, the most commonly used markers are (CEA), CA19-9, CA50, and CA72-4. [12]

PATIENTS AND METHODS:

Study design

A case control study with analytical elements.

Study setting:

Study conducted in oncology teaching hospital in medical city between November 1st 2018 to April 15th 2019.

Sampling technique and sample size:

77 Patient with gastric cancer who attended the oncology center for treatment and follow up were enrolled in this study.

Control

77 Randomized people attending different outpatient clinics in medical city

Inclusion criteria:

We included all patients:

Who had been diagnosed as gastric cancer with adenocarcinoma histopathological type.102 histopathology reports were obtained.

Diagnosis done either by biopsy obtained by OGD or by tru-cut biopsy to metastatic site.

Exclusion criteria:

18 patient excluded due to:
   i. Incomplete clinical data
   ii. Incomplete histopathological evaluation.
   iii. Lymphoma, Gastrointestinalstromal tumors and neuroendocrine tumors or metastatic gastric involvement from other site.
   iv. Doubtful radiological assessment of metastatic site.

Data collection:
A form of data (Appendix 1) was filled for every participant, all fields were filled whenever applicable

RESULT:
A total of 154 participants were enrolled in this study, 77 patients with ca stomach and 77 age and gender matched control participants. Mean age (SD) of (54 ± 13.8 and 55.1 ±13 years) respectively. Male to female ratio 1.3/1.table (1).

Table 1 :Distribution of age and gender among studied groups.

Variable		Participants				Total	P value
		Case		Control			
		No.	%	No.	%		
Age (years)	< 40	14	18.1	11	14.2	25	0.52*
	40-59	36	46.7	43	55.8	79	
	≥60	27	35	23	29.8	50	
Gender	Male	44	57.1	42	54.5	86	0.76*
	Female	33	42.8	35	45.4	68	

*chi-square test, significant ≤0.05.

102 histopathology reports were obtained either via OGD or biopsy from metastatic site. Some patients have more than one histopathology including one from gastric site and second from metastatic site or re biopsied when progressed.
The most frequent site for cancer in patients with ca stomach was antrum (24) 31.1% of cases, the other site of cancer was body of the stomach in (15)19.4%, cardia (14)18.1% , pylorus(14) 18.1% and fundus in (10)12.9%

The histopathological study revealed that the majority were diffuse subtype (39) 50.6%. And regarding the grade, 34(44.1%) of patients had poorly differentiated tumor. With a stage IV in the majority of patients (48) (62.4%).table2

Table 2: TNM staging of studied patients.

Stage	I	1	1.2%
	II	12	15.6%
	III	16	20.8%
	IV	48	62.4%

The Number of patients with stomach cancer who smoker was (48/77) (62.3%) of index group compared to (33/77) (39%) in control participants suggest a significant association (p=0.002).Table 3
First degree family history for ca stomach was positive in (9/77) 11.7% in index group compared to none in control participants suggesting a significant difference (p= 0.001).Table 3
On the other hand Blood group A was found in (27/77) 35.1% of index group compared to (18/77) 23.4% of control group with no significant difference (p=0.25).table 3

Table 3: Prevalence of risk factors of gastric cancer.

Risk factor	Category	Participants				Total	P value
		Case		Control			
		No.	%	No.	%		
Smoking history	Never smoke	29	37.7	47	61	76	0.002*[s]
	Smoker	48	62.3	30	39	78	
	total	77	100	77	100	154	
Family history of ca stomach	-VE	68	88.3	77	100	125	0.001**[s]
	+VE	9	11.7	0	0	29	
	Total	77	100	77	100	154	
Blood group	A	27	35.1	18	23.4	45	0.25*[ns]
	B	19	24.7	16	20.7	16	
	AB	7	9.1	9	11.7	35	
	O	24	31.2	34	44.2	58	
	Total	77	100	77	100	154	

*chi-square test,** fisher exact test, significant p ≤0.05.

DISCUSSION:

Incidence of gastric cancer has steadily declined worldwide over the past 50 years, these declines preceded the successful reduction of H. pylori infection, and are likely attributable to changes in food preservation, such as less pickling of vegetables, and less smoking and processing of meat.[13]

The mean age at diagnosis was 54 years in this study with majority (46.7%) of patient aged (40-59 years) close to Mazaher Ramezani et al, Department of radiation oncology, Emam Reza Hospital, Kermanshah, Iran.[14]

Regarding gender; male to female ratio was (1.3:1) consistent to Alaa's[15] and Mazaher's [15] studies, and with worldwide figures and may reflect a more exposure to carcinogens including smoking, and dietary habits.[16]

We found a significant association between smoking history and gastric cancer in consistence with most of worldwide literatures [17,18,19].

Blood group A higher among index group compared to control one but not enough to be statistically significant (P=0.25). In consistence with several large studies from the Scandinavian Countries [20].

There was a significant association of smoking with intestinal histopathological type (p=0.03), in consistence to a study conducted by Abaham M. Y. Nomura et al [21], who also found a similar association of histopathological type with smoking.

CONCLUSION:

Men in their fifth decade were more affected, Majority of patients presented stage four of cancer, Majority of patients have diffuse subtype of adenocarcinoma, Smoking and family history of first degree relative of gastric cancer have strong association with gastric cancer and Smoking associated with intestinal subtypes of adenocarcinoma more than others.

Recommendation:

Expanding the scope of number of patient as well as control group, make it a demographic study and added other important risk factors like confirmed history of peptic ulcer and food type.

Screening program by OGD for high risk patient with positive family history of gastric cancer for early detection and curative resection. Education of avoid smoking can reduce risk of gastric cancer. Diet Education to avoid uncooked food, salty and spicy food.

appendex

Risk factors in gastric tumor

Appendix

Data collection form

☐Age

☐Sex

☐Histopathology

☐Grade

☐TNM staging system

☐Site of metastasis

☐History of first degree relative of gastric cancer

☐Blood group
☐Smoking which obtained in pack-year
☐Primary tumor sites

Definition of variable:

- Age of patients: young age<40 years, middle age40-60 years and old age >60 years.
- Gender: male, female.
- Smoking history: obtained in packs –year
- Number of pack –year= (number of cigarettes smoked per day/20) ×number of smoking years.
- Never smoker: An adult who has never smoked, or who has smoked less than 100 cigarettes in his or her lifetime.[22]
- Former smoker: An adult who has smoked at least 100 cigarettes in his or her lifetime but who had quit smoking at least 6 months before interview.[23]
- Current smoker: An adult who has smoked 100 cigarettes in his or her lifetime and who currently smokes cigarettes or smoked within 6 months before interview.[22]

First degree Family history: a close blood relatives which includes parents, full siblings, or children.[23]

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