

Evaluation of possible risk factors in the development of gastric cancer

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Abstract

Context: Gastric cancer is the most prevalent among gastrointestinal cancers, and one of the deadliest diseases in Iran. It is very important to understand the factors that affect this disease.

Aims: The purpose of this study was to investigate the factors affecting gastric cancer patients in Ahvaz in 2018.

Settings and Design: In this descriptive cross-sectional study, 105 gastric cancer patients were included in this study within 3 months after obtaining the signed informed consent from them. The study population was selected using the census.

Materials and Methods: The data gathering tool was a researcher-made questionnaire on the factors affecting the disease.

Statistical Analysis Used: Data were analyzed using descriptive statistical tests, one-dimensional Chi-square and binomial and SPSS-16.

Results: Of 105 patients with gastric cancer, 75 (71.4%) were male, 85 (81%) were married, 15 (14.3%) had an alcohol history, and 75 (71.4%) had a history of fast food consumption. A positive blood group with the number 25 (23.8%) was the most common type of blood. In examining the effective variables, it was also found that gender, residence, smoking, and alcohol were significantly affected by the binomial test on gastric cancer ($P < 0001$).

Conclusion: The results of this study indicate that many factors, such as fast food and urban life, smoking and alcohol, and a positive blood-type A group affect the disease.

Keywords: Gastric cancer, Incidence, Risk factors

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Received: 09 June 2018; **Accepted:** 31 July 2018; **Published:** 08 October 2018.

INTRODUCTION

Gastric cancer is known as the fifth most common cancer in the world.^[1] More than 950 million people are diagnosed with gastric cancer every year and 750 million of them are eradicated due to certain causes.^[2] In the United States less than a century ago, this disease was reported as the most common chemotherapy-resistant cancer.^[1] It should be

noted that the mortality of this type of cancer decreases with the treatment of *Helicobacter* infection. The highest incidence rate was recorded in East Asia, Eastern Europe, and South America, whereas North America and Africa show the recorded lowest rates. China accounts for 42% of all cases of gastric cancer worldwide due to a large population that is at least part of it alone,^[3] but in Asia, it

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How to cite this article: Hemmatipour A, Naderzadeh I, Saberipour B, Rouholamini S, Taban F. Evaluation of possible risk factors in the development of gastric cancer. *J Nurs Midwifery Sci* 2018;5:21-4.

Access this article online	
Quick Response Code:	Website: www.jnmsjournal.org
	DOI: 10.4103/JNMS.JNMS_13_18

is the most common cancer^[2] and considered as the third cause of death in the world.^[1] The mortality rate of gastric cancer is higher than the common malignancy such as colon, breast, and prostate cancer.^[3] In Iran, the incidence of gastric cancer is increasing, especially in western Iran, unlike the advanced countries. This increase has been seen in the other regions of the country, including Khuzestan province.^[4] According to the latest research conducted in Iran (1996), the prevalence of this cancer was about 9.3%^[4] as the most common type of cancer among men, and third cancer after breast cancer and colorectal among women and the prevalence of this disease is 4.9% in the Khuzestan province and the incidence in men is 2 times than women.^[5] Gastric cancer is usually observed in patients over 40 years of age as well as the average age of patients is about 60 years in the time of its diagnosis. The risk of this cancer is higher in the lower socioeconomic class of society. Nearly 90% of the stomach cancers are Adenocarcinoma.^[6] The signs and symptoms of this disease include unacceptable weight loss, anorexia, ambiguous symptoms of dyspepsia such feeling of early satiety, nausea, and vomiting.^[7] As we knew, the main treatment for gastric cancer is in the early stages of surgery, and the radiotherapy and chemotherapy are carried out as the supplementary phase. Surgery, radiotherapy, and chemotherapy are used for the treatment of advanced progression stages of the disease, but they usually are not in line with good results. Perhaps, the most important action to improve the success of treatment of this type of cancer is by its early diagnosis.^[6,7] The study of the causes and factors influencing the onset of the disease by considering the prevalence and high mortality rate of gastric cancer in the country is essential. The various studies have been conducted to investigate the various factors of the disease. While its cause is complicated, the most important and known risk factors, are *Helicobacter pylori* infections and host genetic factors.^[3,8] In some studies, the biological factors,^[1,3] bacterial infections,^[3] and the types of occupational exposure were mentioned, and in some other cases, the environmental factors,^[2] smoking,^[3] and the diet type were mentioned.^[9]

Considering the results of these studies and the high rate of gastric cancer, and the low survival rate of these types of patients, and that there are many factors affecting this kind of cancer, and on the other hand, in Khuzestan province due to environmental pollution and high prevalence of obesity and fast food consumption requires further studies on risk factors in this province. Therefore, we decided to carry out a study aimed at determining the possible factors affecting the onset of this disease in the city of Ahvaz in 2018.

MATERIAL AND METHODS

This descriptive study was performed within 3 months. The study population included 105 patients with gastric cancer, who referred to Ahvaz Shafa Hospital (Cancer Treatment Center), diagnosed with gastric cancer from 2011 to 2017. The patients were selected by census method and entered the study with informed consent. The exclusion criteria for withdrawal of this study were the lack of completion of the questionnaire and the lack of appropriate mental and psychological conditions.

To observe ethical standards, the researchers obtained the permission from the vice chancellor for research at Shoushtar School of Medical Sciences. Then, the researchers visited the Ahvaz Shafa Hospital the, while introducing themselves and expressing the purpose of the study, by referring to the hospitalized patients and interviewing with them, recorded the required information in the questionnaires. The researchers stressed that patient personal information would also remain confidential. The data collection tool was a questionnaire containing the required data on this disease, including the demographic information and possible contributing factors in the disease: age, gender, marital status, occupation, place of residence, blood group, fast food consumption, smoking, drinking alcohol, chemical and herbal drug consumption, underlying diseases, *Helicobacter* infection, and gastric reflux.^[4]

The researchers while introducing themselves and expressing the purpose of the study, referred to the inpatients wards. Then, the data were registered and recorded.

The content validity method was applied for determining the validity of the tool. The questionnaire was distributed among 10 faculty members related to the topic of study so that they judged the content, the level of clarity and simplicity of each of the terms in the tool, and after applying the corrective comments, the questionnaires to be applied in the research. The data normality was assessed by the Kolmogorov–Smirnov test, which revealed that the data have a normal distribution. After data collection and encoding, the data were analyzed using the SPSS-16 (SPSS Ins. Released 2007 Spss for Windows, version 160, Chicago) and central parameters, Chi-square, and binomial tests were applied for examining the relationship between variables. *P* value items were <0.05 and considered as statistically significant.

RESULTS

Out of the 105 patients, 75 individuals (71.4%) were male and 85 (81%) were married [Table 1]. According to the binomial test, there was a significant difference regarding place of residence, smoking, gender, and alcohol consumption ($P < 0.001$).

Among the patients with gastric cancer, the most common cases reported were the blood type A \div and the lowest group was – AB. In addition, the highest number of patients (45 people; 43%) was in the age range of 20–40 [Table 2].

The Chi-square test was applied for showing significant difference regarding the age, blood group, history of chemical drug usage, type of occupation, and marital status ($P < 0.001$).

DISCUSSION

The results of this study indicated that many factors affect gastric cancer. In this study, the most cases were in the age range of 40–60 years old and male gender. In the studies conducted by Ang *et al.*^[10] Zali *et al.*^[6] and Okada *et al.*,^[1] also the gender of the majority of patients were male. However, the gender of the affected population was more than female in the study conducted by Bardeh,^[11] which could be because of the significant regional disparities in the onset and the outbreak of gastric cancer.^[3]

Furthermore, in the study conducted by Zali, the study population was over 60 years old,^[6] and in Okada's study, the study population was over 80 year old^[1] that is not consistent with the present study. It can be stated that the main reason diagnosed for this is that considering the age range of the patients and the consumption of fast food can be a factor in the prevalence of the disease at a young age in the present study; because, these types of foods have a lot of salt that causes colonization and viral infection of the *Helicobacter* and inflammation of the gastric epithelium and an increase in epithelial cells which may be associated with internal mutations.^[10] In other studies, the cause of the disease was known to be inflammatory caused in the younger ages.^[9] In this study, it was found that there is a statistically significant relationship between the married and the employee with gastric cancer, which is in line with the studies by Zhang *et al.*^[2] and Saghier *et al.*^[3] The marital life, if accompanied by low economic situation and income, is a factor affecting the development of this disease.^[6] It should be noted that there was a significant relationship between smoking and gastric cancer in this study that is consistent with the studies conducted by Sagheer^[3] and Mahmoudi,^[4] but is not consistent with the studies by Okada *et al.*^[1] and

Ma *et al.*^[12] There was a statistically significant relationship between the consumption of alcohol, which is consistent with the study by Okada *et al.*^[1] and not in the same direction as Keima's study.^[12] In some studies, it has been pointed out that the main mechanism of alcohol probably is related to the primary metabolites of Acetaldehyde, which has a local toxic effect that increases the risk of gastric cancer. It should be noted that in our study the results showed that the combined consumption of alcohol with cigarettes would increase the chance of catching gastric cancer to 5 times.^[12] In this study, there was a significant relationship between the A+ blood group with cancer as the most affected group and –AB

Table 1: Frequency and investigation of factors affecting on gastric cancer using binomial and Chi-square test

Variable	n (%)	Significance level (binomial and Chi-square test)
Gender		
Male	75 (71.4)	$P < 0.001^{**}$
Female	30 (28.6)	
Marital status		
Unmarried	10 (9.5)	$P < 0.001^{**}$
Married	85 (81)	
Single	10 (9.5)	
Occupation status		
Student	10 (9.5)	$P < 0.001^{**}$
Employee	60 (57.1)	
Retired	20 (19)	
Unemployed	10 (9.5)	
Residence		
City	95 (90.5)	$P < 0.001^{**}$
Village	10 (9.5)	
Family history		
Yes	30 (28.6)	$P = 0.078$
No	75 (71.4)	
Alcohol consumption		
Yes	15 (14.3)	$P < 0.001^{**}$
No	90 (85.7)	
Smoking		
Yes	30 (28.6)	$P < 0.001^{**}$
No	75 (71.4)	$P < 0.001^{**}$
Drug use history		
Chemical	45 (42.9)	$P < 0.001^{**}$
Herbal	5 (4.1)	
Both of them	20 (19)	
None of them	35 (33.3)	
History of fast food consumption		
3 times a week	45 (42.9)	$P = 0.055$
3 times per month	30 (28.6)	
Without consumption	30 (28.5)	
History of digestive disease		
Yes	21 (20)	$P = 0.08$
No	84 (80)	
Helicobacter pylori		
Yes	30 (28.6)	$P = 0.078$
No	75 (71.4)	
Reflux		
Yes	90 (85.7)	$P < 0.001^{**}$
No	15 (14.3)	

Significance at the level of 0.05 using binomial and Chi-square test,
 ** Significance at the level of 0.001 using Chi-square test

Table 2: Frequency and investigating the relationship between the factors affecting the gastric cancer using the one-dimensional Chi-square test

Variable	n (%)	Significance level (Chi-square test)
Age		
<20 years old	10 (9.5)	P<0.001**
20–40 years old	45 (43)	
40–60 years old	40 (38)	
Over 60 years old	10 (9.5)	
Blood group		
A+	25 (23.8)	P<0.001**
-A	5 (4.8)	
B+	20 (19)	
B	20 (19)	
AB+	15 (14.3)	
-AB	0	
O+	15 (14.3)	
-O	5 (4.8)	

Significance at the level of 0.05 using one-dimensional Chi-square test,

**Significance at the level of 0.001 using Chi-square test

as the least affected group, which was similar to studies conducted by Zali *et al.*^[6] and Compare *e*^[9] However, in the study conducted by Kampari, the least affected blood groups was-O blood group.^[9] In this study, there was a significant difference in the residence place and history of drug use so that most of the affected people lived in the city and were more exposed to environmental factors. Regarding the drug usage, it was found that people who used to take the chemical drugs such as ibuprofen and herbal and cardiovascular drugs such as dexamethasone had further chances to catch the gastric cancer, which is consistent with the study conducted by Ang *et al.* who, in their study, refer to the drinking the green tea due to an antioxidant that prevents the growth of cancer cells; however, in the various studies, it was observed that this green tea did not have any effect on the reduction of gastric cancer and no obvious benefits were diagnosed in the usage of this plant.^[10] In this study, there was no a significant relationship between the history of gastrointestinal diseases and family history, perhaps because of the low sample size, which was regarded as the most important limitation of this research. Therefore, this restriction is expected to be overcome by extending the sampling to the private centers having the facilities and patients.

CONCLUSION

The results of this study showed that many factors such as smoking and alcohol and the use of herbal remedies and urban life due to stress and workload at an early age affect the disease. It is suggested that strategies be used to address these factors in the people of this city.

Conflicts of interest

There are no conflicts of interest.

Authors' contributions

All authors contributed to this research

Financial support and sponsorship

This study was financially supported by Shoushtar Medical School.

Acknowledgment

At the end of the course, the authors would like to express their gratitude to the research deputy of Shushtar Medical School as well as to the dear patients participating in this study.

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