

Epidemiological review of gastric cancer in educational hospitals of Birjand University of Medical Sciences (2006-2011)

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ABSTRACT

Background and aims: Gastric cancer is one of the most common cancers all over the world and is the world's second fatal cancer. This study was done to identify the epidemiological features and risk factors of gastric cancer in different regions of Birjand. Such study can be an effective step in preventing, controlling and curing the diseases.

Methods: This descriptive-analytical study was conducted in Birjand educational hospitals. All patients with gastric cancer who were hospitalized in the period 2006-2011 in educational hospitals were recruited through census. Data were collected using researcher-made checklist through examining medical record of patient. Data were analyzed using descriptive and analytical statistics by SPSS software. Ethical approval was received from the Birjand University of Medical Sciences.

Results: Results of this study showed that villages around Ghaien had the highest rate of gastric cancer (n=14, 12.6%). In this study, the relationship between histopathology with therapeutic interventions (P=0.006) and diagnostic methods (P=0.005) was significant. In addition, there was a significant relationship between the place of residence (P=0.018) and the type of therapeutic interventions.

Conclusion: Findings of this study depicted an accurate and complete image of the epidemiology of this cancer in the region and provided authorities with valuable findings to make decisions about the identification of risk factors of gastric cancer in order to reduce cancer rates. It can also be an alarm for the villagers to change their habits and diet and to have a healthy life.

Keywords: Gastriccancer, Cancer epidemiology, Histopathology.

INTRODUCTION

Following health improvement and reduction of the incidence of infectious diseases, cancer has become one of the most

common causes of mortality and disability worldwide, especially in developing countries. The World Health Organization

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has estimated that 15 million people will suffer from cancer in 2020.¹ Accordingly, the incidence of cancer will increase from 59% to 70% in developing countries. Aging in developed and developing countries increased rate of smoking and unhealthy lifestyles will affect this phenomenon. Cancer is a disease related to the lifestyle; choosing unhealthy lifestyles in developing countries is considered as one of the most important risk factors in increasing the incidence of cancer.²

Gastric cancer is one of the most common cancers all over the world. Nowadays, gastric cancer accounts for about 10 percent of all cancers in the world and is among the five most common cancers. Concerning fatality, it is the second fatal cancer in the world that more than half of it happens in developing countries.^{3,4} Its epidemiology is of great importance because although its mortality rate has decreased over the past decade, it is still considered as a serious health problem.⁵ Iran is among few countries in the world in which gastric cancer is still common. Unlike western countries and Japan, the incidence of gastric cancer has increased in Iran in the past two decades. Gastric cancer has a high incidence, especially, in north-west of Iran. Its cardiac type is more common in the northwest, while its non-cardiac type is more common in the south.⁶⁻⁸

Clinical symptoms of gastric cancer are not diagnosable at early stage due to vague and nonspecific symptoms. Patients usually refer to physicians when the tumor has spread and developed. In this stage, treatment response is often low and patients have short life expectancy.⁹ Therefore, early diagnosis of gastric cancer is very important. Moreover, epidemiological diversity of gastric cancer, compared to other cancers, has caused this disease to be called a personal disease.^{10,11} Etiological factors of gastric cancer have not been fully understood yet, but according to

the results of many studies, environmental and personal factors can be involved in its formation. Age, gender, blood type, heredity, unhealthy diet, water pollution and geographic region are the probable factors of gastric cancer.¹²⁻¹⁵

Several studies have tried to identify the risk factors of gastric cancer. Tobacco consumption, consumption of too much salt, inadequate fruits and vegetables consumption, family related factors, occupational and environmental exposures and *Helicobacter pylori* infection are the factors examined by these studies.¹⁶⁻²² Exposure to these risk factors depends on time, place and social and geographical characteristics of the community. Therefore, the effectiveness of early preventive programs depends on our knowledge of risk factors. Pathological findings of Birjand educational hospitals showed that most cases of cancer were related to the digestive system, especially stomach. Since identifying the epidemiological features and risk factors of a disease in different regions can be an effective step in preventing, controlling and curing the disease. Of course, because no study has been done on the epidemiology of gastric cancer in Northern Khorasan, this study was done to identify the epidemiological features and risk factors of gastric cancer in different regions of Birjand between 2006 and 2011.

METHODS

This descriptive-analytical study was conducted in Birjand educational hospitals. In this study, the statistics related to the number of patients whose disease was confirmed by a pathologist and who were hospitalized in educational hospitals were collected from pathology centers affiliated to Birjand University of Medical Sciences between 2006 and 2011. In total, 111 patients with gastric cancer were identified during

these years. In order to collect data, patients' medical records were reviewed.

The instrument used in this study was a researcher-made checklist whose validity was confirmed by five faculty members. The variables used in this checklist included age; sex; place of residence; occupation; marital status; history of substance use; family history of cancer; type of treatment; history of hypertension, diabetes, hyperlipidemia and previous surgery; cancer diagnosis method and histopathological type of cancer. To collect data, the researchers examined admission and discharge sheets, summary sheets, medical history sheet, progress sheet, operation report sheet, physical orders sheet and pathology of patients' medical records carefully and entered the variables into the checklist. Regarding to ethical considerations, patients' information remained confidential and ethical approval was received from the Birjand University of Medical Sciences.

Data were analyzed using descriptive (frequency and relative frequency) and analytical (Chi-square) statistics by SPSS software. One of the limitations of this study was incomplete and poor documentation of some of the required data items in the medical records. To overcome this limitation the researchers made call to the patients to obtain the correct and exact information.

RESULTS

Results of this study showed that most patients with gastric cancer (n=75, 67.6%) were male. More than half of patients with gastric cancer (n=64, 57.7%) were between 60 and 80 years old and lived in the village (n=60, 54.1%). The villages around Ghaien had the highest rate of gastric cancer (n=14, 12.6%). More than one third of patients were farmers (n=38, 34.2%). Moreover, most patients were married (n=101, 91%) (Table 1).

Table 1: Frequency distribution of demographic data in patients with gastric cancer

| Variables | | Frequency of gastric cancer (%) | |
|----------------|------------------|---------------------------------|--------|
| Gender | Male | 75(67.6) | |
| | Female | 36(32.4) | |
| Age | 20-39 | 7(6.3) | |
| | 40-59 | 33(29.7) | |
| | 60-79 | 64(57.7) | |
| | 80-more | 7(6.3) | |
| | | | |
| Marital status | Married | 101(91) | |
| | Single | 2(1.8) | |
| | Widowed | 8(7.2) | |
| Residence | Urban | 51(45.9) | |
| | Rural | 60(54.1) | |
| Rural area | Birjand region | 12(10.8) | |
| | Ghaien region | 14(12.6) | |
| | Ferdows region | 1(0.9) | |
| | Nehbandan region | 9(8.1) | |
| | Khoosef region | 9(8.1) | |
| | Shoosef region | 1(0.9) | |
| | Sarpishe region | 3(2.7) | |
| | Darmian region | 7(6.3) | |
| | Occupation | Employee | 8(7.2) |
| | | Worker | 1(0.9) |
| Farmer | | 38(34.2) | |
| Self-employee | | 5(4.5) | |
| Housewife | | 29(26.1) | |
| Others | | 30(27) | |

No history of substance use (n=77, 69.4%), hypertension (n=106, 95.5%), diabetes (n=107, 96.4%) and hyperlipidemia (n=108, 97.3%) were observed in the majority of patients with gastric cancer. In

this study the patients' history of previous surgeries also were examined and it was shown that the majority of patients with gastric cancer (n=86, 77.5%) had no history of surgery (Figure 1).

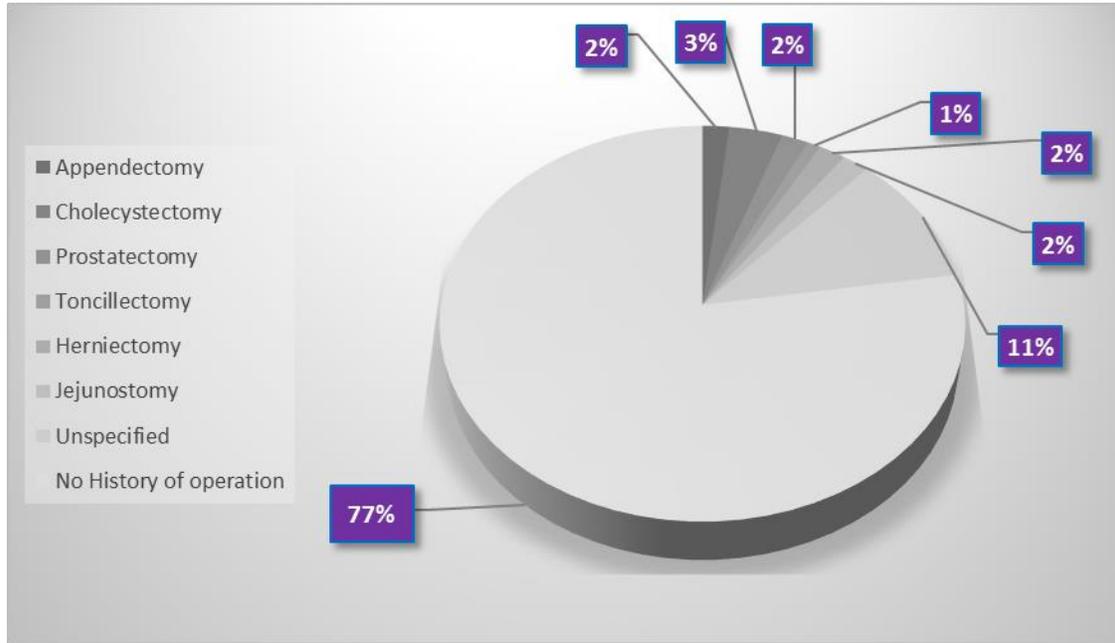


Figure 1: The frequency distribution of history of surgery in patients with gastric cancer

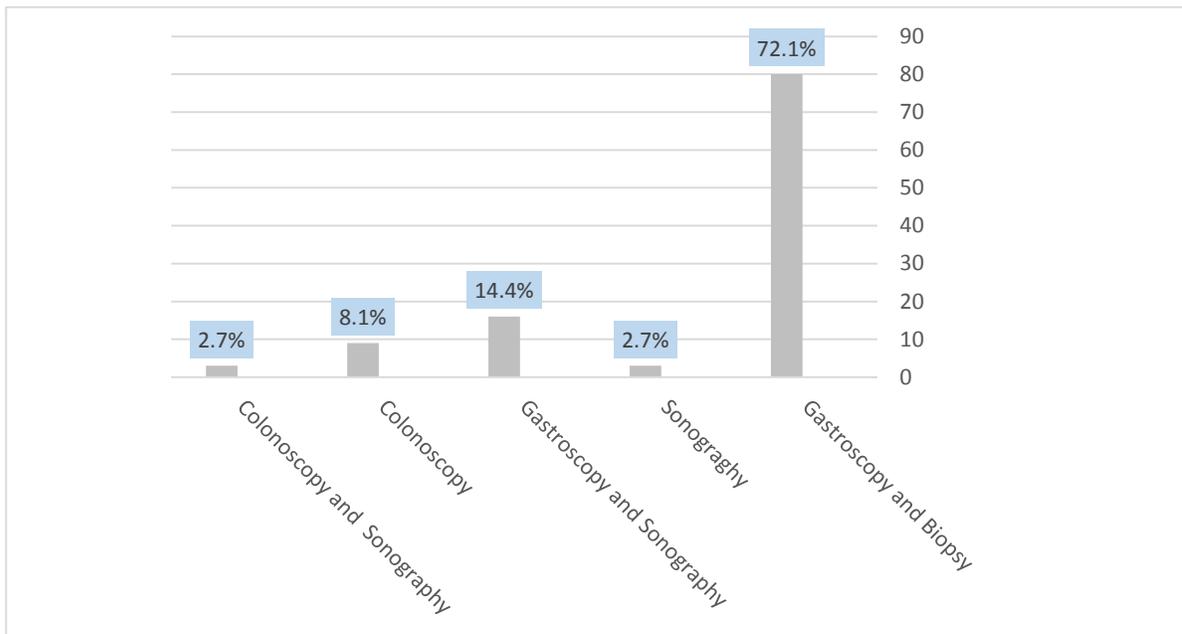


Figure 2: The frequency distribution of diagnostic methods in gastric cancer

Family history of cancer was reported in one patient (0.9%). Therapeutic interventions taken for patients included medical therapy (n=45, 40.5%), gastrectomy (n=43, 38.7%), and other treatments (n=22, 19.8%). In order to diagnose gastric cancer, a combination of diagnostic methods was used. The common diagnostic method for gastric cancer was a combination of gastroscopy and biopsy (n=80, 72.1%) (Figure 2).

Half of the diagnosed gastric cancers had carcinoma morphology (n=57, 51.4%), and the rest had adenocarcinoma morphology. In this study, the relationship between histopathology with therapeutic interventions (P=0.006) and diagnostic methods (P=0.005)

was significant. The most common therapeutic method in patients with gastric carcinoma was medical treatment (n=36, 63.2%), while it was gastrectomy in patients with adenocarcinoma (n=24, 44.4%).

Moreover, gastroscopy and biopsy was a common diagnostic method in carcinoma (n=36, 63.2%) and adenocarcinoma (n=44, 81.5%) (Table 2). In addition, there was a significant relationship between the place of residence (P=0.018) and the type of therapeutic measures; that is, gastrectomy was mainly used among the citizens of city (n=21, 41.2%). There was no relationship between other demographic data and other factors evaluated in this study.

Table 2: The relationship between histopathology with diagnostic and therapeutic methods using bivariate analysis

| Variable | | Frequency of carcinoma (%) | Frequency of adenocarcinoma (%) | P |
|---------------------|----------------------------|----------------------------|---------------------------------|-------|
| Therapeutic measure | Gastrectomy | 13(22.8) | 24(44.4) | 0.006 |
| | Colectomy | 1(1.8) | 7(13) | |
| | Medical treatment | 36(63.2) | 17(31.5) | |
| | Others | 7(12.3) | 6(11.1) | |
| Diagnostic Method | Gastroscopy and Biopsy | 36(63.2) | 44(81.5) | 0.005 |
| | Colonoscopy | 3(5.3) | 6(11.1) | |
| | Sonography | 3(5.3) | 0 | |
| | Colonoscopy and Sonography | 2(3.5) | 1(1.9) | |
| | Gastroscopy and Sonography | 13(22.8) | 3(5.6) | |

DISCUSSION

Results of this study showed that the medical treatment was the most common therapeutic method used for patients with carcinoma. The majority of patients with gastric cancer were farmers living in the villages around Ghaein. It seems that rural people's unawareness of food storage (using smoking and salting methods) and consuming contaminated water could affect the incidence of cancer in this group.²³⁻²⁵ According to the results of some studies

which have shown that consuming red meat can be a risk factor for gastric cancer, consumption of high amounts of red meat and animal fat could be another possible risk factor for gastric cancer in this group.^{26,27} In some other studies, using salted and smoked foods and also nitrates in food and possibly water have been reported as risk factors of gastric cancer.²⁸⁻³¹

Like the results of this study, Pule et al found that there was a significant

relationship between farming and gastric cancer. The probable reason is that farmers are always exposed to chemical toxins and pesticides, and most of them are not fully aware of the correct way of using these materials and their potential harm. Therefore, they are at higher risks of gastric cancer.³² Results of this study revealed that the majority of people with gastric cancer were male and were 60 or more years old. Results of other studies confirm this fact that aging increases the risk of gastric cancer and that most people with this disease are between 50 and 70 years old. This disease is rarely diagnosed in people younger than 30 years old.³³⁻³⁵ It also seems that since some men work in places where they are regularly exposed to substances like nitric acid, nitrous oxide and industrial particles that can act as the primary drivers of gastric cancer. Therefore, this disease is more common in men than in women.²⁰ In addition, tobacco consumption and smoking which is an important risk factor for cancer is common among men. Results of a study showed that the majority of men who suffer from gastric cancer in the world are smokers. In order to reduce its incidence, smoking must be controlled, especially among men.³⁶ Although, the results of this study showed that a small number of people with gastric cancer had a family history of this disease. Findings of other studies revealed that family history of gastric cancer, especially among parents, could increase cancer mortality rate among young people.^{37,38} In this study, a small number of subjects suffered from diabetes; this was in line with the results of a study conducted by Pogacnik.³⁹ However, a study carried out in Sweden provided some evidence showing that type 1 diabetes could increase the risk of cancer.⁴⁰ Results of another study suggested that the incidence of cancer was higher in diabetic people than in non-diabetic ones.⁴¹ Medical treatment and

gastrectomy were the most common therapeutic methods used in the present study. Results of a study showed that based on the differences in clinical and pathological classification of gastric cancer physicians applied different therapeutic methods to treat this cancer.⁴² Moreover, gastroscopy and biopsy was the most common diagnostic method for patients with gastric cancer. Results of some studies showed that there were two major available diagnostic tools: One of them was radiology with barium and the other one was upper endoscopy. The selection of proper methods depended on physicians' viewpoint, patients' selection and their accessibility.^{43,44} Dooley study reported that in cases of suspected cancer, the most important diagnostic evaluations are gastroscopy plus multiple biopsies.⁴⁵ Jalali in his study stated that the accuracy of the diagnosis will increase according to the number of performed biopsies.⁴⁶ Results of this research revealed that there was little difference between the histopathological type carcinoma and adenocarcinoma in gastric cancer. In a study by Noruzinia, it was shown that 95.5% of patients had adenocarcinoma tumors.⁴⁷

Unlike the results of this study, other studies have reported more gastric adenocarcinoma.^{48,49} Place of residence, weather and environmental factors affect cancer morphology. Further studies are needed to confirm this issue. In the present study, evaluating other factors that may affect the incidence of gastric cancer was not possible due to incomplete medical records. Therefore, a comprehensive assessment and reporting system must be implemented in Iran. One of the strengths of this study was that it was less likely to miss the cancer cases because the number of patients was collected from the pathology centers and was then controlled with the number of patients registered in the hospitals.

CONCLUSION

Gastric cancer is a multifactorial disease with both genetic and environmental factors being involved in its formation. Although some risk factors such as age and gender cannot be changed, knowing them could help planners to take the necessary steps to diagnose and treat this disease on time. Other factors such as smoking and tobacco consumption, consumption of contaminated water and occupational and environmental exposures are preventable. Gastric cancer as a common digestive cancer can be prevented by long-term plans made by the authorities, raising people's awareness in this regards and internalizing necessary cultures to have a healthy lifestyle. Findings of this study depicted an accurate and complete image of the epidemiology of this cancer in the region and provided authorities with valuable findings to make decisions about the identification of risk factors of gastric cancer in order to reduce cancer rates. It can also be an alarm for the villagers to change their habits and diet and to establish a healthy life.

CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest.

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Authors' contributions in the current study were: Azam Sabahi, and Leila Ahmadian contributed to conceiving and designing the research. The data was collected by Azam Sabahi. All authors contributed equally in writing the manuscript. All authors reviewed and approved the final manuscript.

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