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Epidemiology of Gastric Cancer in Northwest Iran: 2003-2011

Firouz Amani*, Mohammad Sadrkabir*, Saeid Sadeghieh Ahari*♦, Saeid Barzghari, Abbas Yazdanbod*, Ahmad Sabzevari*, Moghgan Hadavi***

**Faculty of Medicine, Ardabil University of Medical Science, Ardabil, Iran*
***Amol Faculty of Paramedical Sciences, Mazandaran University of Medical Sciences, Sari, Iran*

Abstract

Background: Gastric cancer is the fifth most common cancer in the world and the third leading cause of death from cancer worldwide. This study aims to assess the epidemiology of gastric cancer in Ardabil Province, Iran.

Methods: This was a descriptive cross-sectional study performed on 1056 patients with gastric cancer registered in the Ardabil Cancer Registry. Data were collected by a checklist and analyzed by statistical methods in SPSS version 19.

Results: Out of 1056 cases, 37% were smokers and 80.9% were illiterate. There were 73.1% male cases. Adenocarcinoma was the most common (89.5%) type of cancer and prevalent in males. The tumors were mostly located in the gastric cardia. Most cases were from rural areas.

Conclusion: Results showed that the incidence of gastric cancer in Ardabil Province was higher in males compared to females. Compared to the country standards the incidence of gastric cancer was higher.

Keywords: Gastric cancer, Adenocarcinoma, Epidemiology, Ardabil

Introduction

Gastric cancer is the fifth most common cancer in the world and the third leading cause of death from cancer worldwide.[1] According to a Ministry of Health report in Iran, gastric cancer is the most prevalent cancer in Ardabil Province.[2]

In Iran, cancer is the third most common cause of death after cardiovascular disease, trauma and accidents.[3] Gastric cancer is one of the common cancers of the gastrointestinal tract which due to its invasiveness and lack of clinical symptoms, most of patients are diagnosed with advanced stage of disease and have a low life expectancy.[4]

Worldwide, the incidence of this cancer varies in different geographical areas. Areas which have

♦Corresponding Author:
Saeid Sadeghieh Ahari, MD
Faculty of Medicine, Ardabil University of Medical Science, Ardabil, Iran
Email: s.sadeghiyeh@arums.ac.ir

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Table 1. Frequency of gastric cancer cases by sex and city.

Cities	Female		Male	
	N	%	N	%
Ardabil	104	26.9	283	73.1
Bilesvar	21	37.5	35	62.5
Germi	35	34.3	67	65.7
Kousar	1	11.1	8	88.9
Khalkhal	19	25.3	56	74.7
Meshkinshahr	38	25.7	110	74.3
Naming	23	25.6	67	74.4
Nir	5	16.1	26	83.9
Parsabad	9	15.8	48	84.2
Sarein	0	0	13	100
Other	28	31.8	60	68.2

high incidences of gastrointestinal cancers include Japan, Korea, areas of China and the Caspian Sea.[5] The highest rate of mortality from gastric cancer in Southwest and Central Asia is attributed to Iran with 19.9 per 100,000 deaths.[5] The incidence and mortality of gastric cancer in different geographical regions of the country is different in other regions than the south, these rates increase.

Ardabil is still one of the areas in the world that has the highest incidence of gastric cancer.[7-8] Recently, the incidence and mortality rate of gastric cancer has dramatically fallen worldwide. In line with global reduction, the incidence rate of cancer has decreased in Asia as well. However, the incidence of gastric cancer in Iran remains very high at approximately 26.1 per 100,000.[5] In most countries there is a steady decline in the incidence and mortality from gastric cancer. However in the United States, like Iran, gastric cancer remains on the list of cancers that have a high mortality and is the reason for 2% of all deaths from cancer.[9]

The present study was conducted to assess the epidemiology of gastric cancer in Ardabil Province due to the possibility of effective risk factors in the prevalence of gastric cancer, the distribution of gastric cancer in Ardabil Province and lack of comprehensive studies in this field.

Subjects and Methods

This was a descriptive cross-sectional study of gastric cancer conducted on all 1056 registered samples in the Ardabil Cancer Registry between March 2003 and September 2011. This center has a close relationship with the Endoscopy and Pathology units. Newly diagnosed cancer patients are referred to this center. Information that included age, gender, location, symptoms when admitted, associated symptoms, the stomach's involved area according to the endoscopy report, as well as histological data obtained from the initial sampling were completed for all patients.

The collected data were analyzed by SPSS version 19 using descriptive statistics. The results

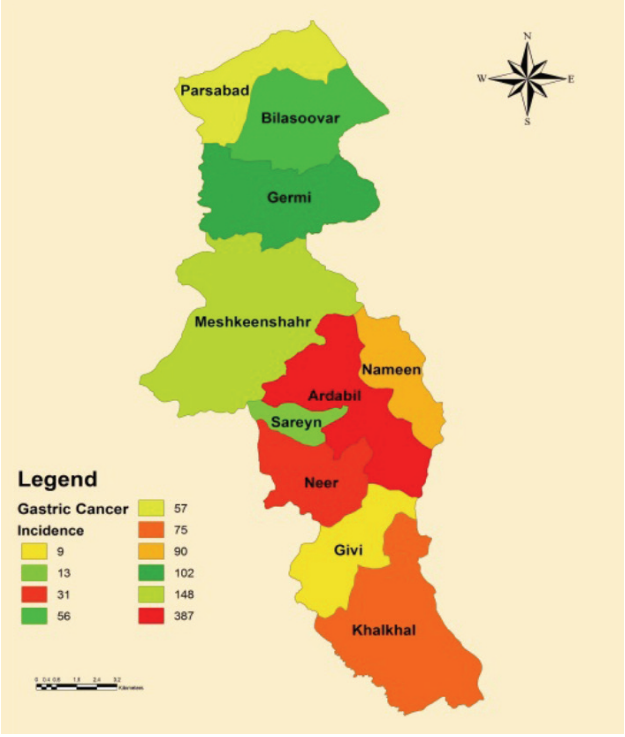

Figure 1. Prevalence of gastric cancer by city.

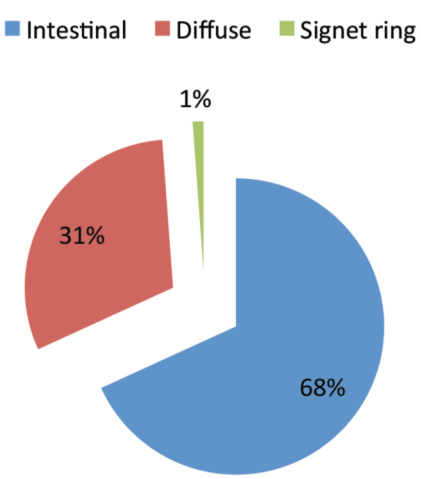

Figure 3. Distribution of adenocarcinoma type in our patients.

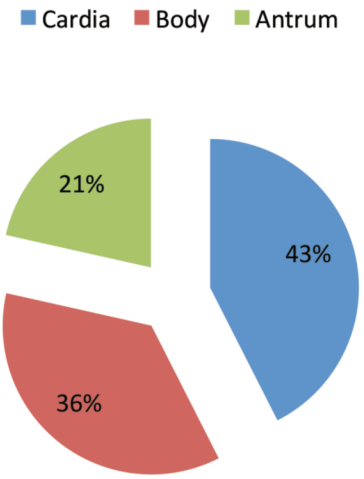

Figure 4. Anatomical involvement of gastric cancer in our patients.

were displayed as frequency and percentage based on demographic data and risk factors. We used software Arc GIS.10 to illustrate the development of regional distribution by sex. We only used the registered data for analysis and estimated the incidence rate.

Results

The total number of cases with gastric cancer was 1056. Of this number, 772 (73.1%) were male and 284 (26.9%) were female. The prevalence rate of the cancer in males was higher than females throughout the province (Table 1). Ardabil (36.6%) had the highest incidence of gastric cancer whereas Kosar had the lowest incidence with 0.9% (Figure 1).

In urban areas, there were 495 (46.9%) cases; the remainder resided in rural areas. This difference was not statistically significant. There were 862 (81.6%) married cases, 854 (80.9%) were illiterate, 444 (42%) were farmers and there were 415 (39.3%) cases who smoked. Gastrointestinal symptoms were present in 1031 (97.6%) cases. Of all cases with gastric cancer, 556 (52.7%) suffered from dysphagia, 693 (65.6%) had regurgitation, and 696 (65.9%) had symptoms of heartburn. From all cases, clinical symptoms were reported in 387 (36.6%). From these, 350 (90.4%) had weight loss (Table 2). Of cases, 946 (89.5%) were affected with the adenocarcinoma type of gastric cancer (Figure 2) out of which 645 (61%) had intestinal involvement (Figure 3). Cardia involvement was noted in 42.5% of cases. (Figure 4)

Discussion

In this study which was similar to previous studies, approximately 53.1% of cases resided in rural areas.[10] In a study by Davoud-abadi et al. on gastric cancer in Shahid Beheshti Hospital, Kashan, Iran, it was found that 63% of patients were rural residents and 37% were from urban areas.[11] The increased incidence of cancer among villagers could probably result from their behavioral patterns, lifestyle, and exposures to pesticides and other related environmental factors.[11, 12] In the current study, 73.1% of patients were male and 26.9% were female which was in line with previous studies conducted in Ardabil Province, Elsewhere in Iran and other countries.[10, 13]

In the current study, 37% of cases had histories

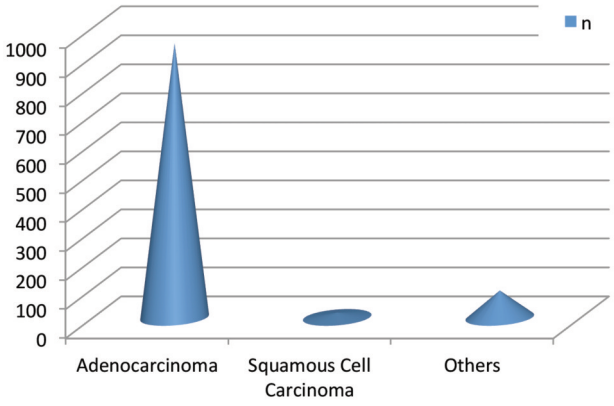

Figure 2. Distribution of gastric cancer types in our patients.

of smoking. According to current statistics, the prevalence of smoking in the adult population of Iran is approximately 25.4%. This high prevalence of smoking consumption in patients has indicated that smoking can be a risk factor for gastric cancer. The result of the present study supported studies carried out in Japan and the city of Kashan.[11,14] Parallel to findings of other studies conducted in Ardabil Province whose participants were mostly countrymen and farmers, in this study, 42% of patients were farmers, 53.1% were rural residents and 80.9% were illiterate.[10] Since 51.7% of patients were farmers and ranchers, in line with other studies we concluded that the cancer incidence was more common in lower socio-economic and deprived classes compared to other classes.[2] In this study, patients had different types of gastric cancer. Outcomes of another study conducted in Ardabil Province indicated that 97% of patients had adenocarcinoma,[10] in the current study 89.5% of patients suffered from adenocarcinoma, 1.6 % had Squamous cell carcinoma (SCC), and 8.8% comprised other types of gastric cancer that included lymphomas, sarcomas and stromal tumors. Anatomically speaking, consistent with previous studies conducted in Ardabil Province, the sites of involvement were the cardia (42.5%), the body of the stomach (38.8%), and antrum (26.2%).[10] A study by Davoodabadi et al. in Kashan stated the most involved site was the gastric antrum with 44%, however the present study revealed a decrease in gastric antrum involvement as well as an increase in the involvement of the cardia and body of the stomach.[11]

Conclusion

Results showed that the epidemiological pattern of gastric cancer in Ardabil slightly differed from other places. Due to the greater geographical dispersion of gastric cancer in rural areas and low socio-economic status of rural versus urban areas, more attention should be paid to these groups compared to other groups for better prevention of gastric cancer in the future.

Table 2. Distribution of symptoms in our patients.

Variables	N (%)
Gastrointestinal symptoms	1031 (97.6)
Clinical symptoms	387 (36.6)
Weight loss	350 (90.4)
Nausea	7 (1.8)
Anorexia	18 (4.7)
Dyspepsia	1 (0.3)
Other	11 (2.8)
Dysphagia	556 (52.7)
Regurgitation	693 (65.6)
Symptom of heartburn	696 (65.9)
Gastrointestinal bleeding	131 (12.4)
Family history of gastric cancer	190 (18)

Conflict of Interest

No conflict of interest is declared.

References

1. Fock KM. Review article: the epidemiology and prevention of gastric cancer. *Aliment Pharmacol Ther.* 2014;40(3):250-60.
2. Babaei M, Jaafarzadeh H, Sadjadi AR, Samadi F, Yazdanbod A, Fallah M, et al. Cancer incidence and mortality in Ardabil: Report of an ongoing population-based cancer registry in Iran, 2004-2006. *Iranian Journal of Public Health.* 2009;38(4) :35-45.
3. Babaei M, Mousavi S, Malek M, Tosi G, Masoumeh Z, Danaei N, et al. Cancer occurrence in Semnan Province, Iran: results of a population-based cancer registry. *Asian Pac J Cancer Prev.* 2005;6(2):159-64.
4. Maconi G, Manes G, Porro GB. Role of symptoms in diagnosis and outcome of gastric cancer. *World J Gastroenterol.* 2008 Feb 28;14(8):1149-55.
5. Rahman R, Asombang AW, Ibdah JA. Characteristics of gastric cancer in Asia. *World J Gastroenterol.* 2014;20(16):4483-90.
6. Yazdanbod A, Arshi Sh, Derakhshan MH, Sadjadi A, Malekzadeh R. Gastric cardia cancer; the most common type of upper gastrointestinal cancer in Ardabil, Iran: an endoscopy clinic experience. *Arch Irn Med.* 2001; 4 (2): 76-79
7. Babaei M, Pourfarzi F, Yazdanbod A, Chiniforush MM, Derakhshan MH, Mousavi SM, et al . Gastric cancer in Ardabil, Iran--a review and update on cancer registry data. *Asian Pac J Cancer Prev*. 2010; 11(3):595-9.
8. Sadjadi A, Malekzadeh R, Derakhshan MH, Sepehr A, Nouraie M, Sotoudeh M, et al. Cancer occurrence in Ardabil: results of a population-based cancer registry from Iran. *Int J Cancer.* 2003; 107(1):113-8.
9. Kasper, DL; Braunwald, E; Hauser, S, et al. Harrison's

principles of internal medicine. 16th ed. Mcgraw-Hill: London; 2005.p.523-32.
10. Taghavi N, Nasrollahzadeh D, Merat S, Yazdanbod A, Hormazdi M, Sotoudeh M, et al. Epidemiology of upper gastrointestinal cancers in Iran: a sub site analysis of 761 cases. *World J Gastroenterol.* 2007; 13(40):5367-70.
11. DavoodAbadi A, Sharifi H, Erfan N, Dianati M, Abdolrahimi E. An epidemiologic and clinical survey on gastric cancer patients referred to Shahid Beheshti Hospital of Kashan (1994-2001). *RJMS.* 2003; 10(34):211-20.
12. Boccolini PDMM, Asmus CLRF, Chrisman JDR, Câmara VDM, Markowitz SB, Meyer A. Stomach cancer mortality among agricultural workers: results from a death certificate-based case-control study. *Cad Saúde Colet.* 2014;22(1):86-92.
13. Nourinayer B, Akhondi Sh, Asadzadeh H, Ansari Sh, Behrouz N, , Zali MR. Evaluation of gastric cancer related indicators in Tehran and 7 other provinces in, 1999 and 2000. *Medical Sciences Journal of Islamic Azad University, Tehran Medical Branch.* 2005; 15(1):15-18 .
14. Nishino Y, Inoue M, Tsuji I, Wakai K, Nagata CH, Mizoue T, et al. Tobacco smoking and gastric cancer risk: an evaluation based on a systematic review of epidemiologic evidence among the Japanese population. *Jpn J Clin Oncol.* 2006;36(12):800-7.