

RESEARCH ARTICLE

Epidemiology of Esophageal Cancer in Ardabil Province During 2003-2011

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Abstract

Background: The aim of this research was to perform an epidemiologic survey of esophageal cancer in Ardabil province. **Materials and Methods:** In this cross-sectional descriptive study, 661 patients diagnosed with EC were studied from March 2002 to May 2011 e. The necessary data were collected with a checklist from the documents in Ardabil Cancer Registry (ACR) and analyzed by statistical methods with SPSS.18 software. **Results:** Of the total new cases of EC registered in ARC during study period, 430 (65.1%) of patients were male with the male to female standard ratio was 1.18, with a statistically significant gender bias. The most common morphology of EC was squamous cell carcinoma (SCC, 68.8%) followed by adenocarcinoma (28.5%). It was observed that in most of patients, EC lesions were in the middle third of esophagus. In addition, most patients were rural and about 40% had smoking habits. The age-standardized incidence rate of cancers was 48.4 per 100,000 among females and males. The annual incidence rates in males and females was 7.1 and 6.7 per 100,000; respectively. **Conclusions:** Results showed that the prevalence and annual incidence rate of cancer in Ardabil province is lower than other areas of the country with a male predominance and a relatively high proportion of adenocarcinomas.

Keywords: Esophageal cancer - epidemiology - risk factor - Ardabil

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Introduction

The esophageal cancer (EC) is the third prevalent cancer of digestive system and 8th common cancer worldwide (4% of whole) which is related to different factors such as geographical width, age, job, and birth place. The south-eastern margin of Caspian Sea is one of areas with high incidence of esophageal cancer in the world (Semnani et al., 2004). In Iran annually, an estimated total of 6500 EC occur that of which 5800 patients die from EC within the same year (Pourfarzi et al., 2011).

Ardabil Province is one of the provinces located in northwestern Iran, an area 70 km inland from the western Caspian coastline, with an area of about 17953 km² of the total area of Iran. According to the 2010 census, the population of Ardabil province is 1,272,214 (1.7% of the total population of Iran).

The esophageal cancer is the second prevalent cancer affecting both males and females and upper digestive tract cancers are the leading cause of 43% death in Ardabil province (Babaei et al., 2009). Demographic and histopathologic pattern of esophageal cancer in northwestern region of Iran was different from its histopathologic pattern in western countries (Pedram et al., 2011).

The incidence rate of esophageal cancer was different throughout the world. Clinical and epidemiological

pattern of esophageal cancer in South-East of Iran was partially differed with other parts of the county which was important for both clinicians and health policy makers (Mashhadi et al., 2011).

The esophageal cancer is common in the area extending from the west, and southern coast of Caspian Sea to east and north of China, including Iran, central Asia, Siberia, and Mongolia. Also, this disease has spread to other regions like Finland, Iceland, Curacao, southeastern part of Africa, and northwestern part of France (Yomralioglu et al., 2009). In Globocan 2008 (Ferlay et al., 2010), it was found to be the eighth most common cancer worldwide, with 481,000 new cases, and the sixth most common cause of death from cancer with 406 000 deaths (5.4% of the total). More than 80% of the cases and deaths occur in developing countries and Central and East Asia have particularly high rates (Igissinov et al., 2010).

In North America and Western Europe, this kind of cancer is more common among black people and men. This disease is generally manifested at the ages higher than 50 and it seems that this disease is more common in societies with severe economic-social conditions. Approximately 10% of esophageal cancer happens in the upper thoracic (cervical esophagus) and about 35% in middle third of esophagus as well as 55% in lower third of esophagus (Jalali et al., 2005).

Esophageal cancer is the eighth most common cancer

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worldwide. An estimated 480,000 people across the world were diagnosed with esophageal cancer in 2008, accounting for 4% of the total (Semnani et al., 2004). The developing countries carry the biggest burden of esophageal cancer, with more than eight out of ten (83%) cases being diagnosed there in 2008 (Ferlay et al., 2011).

There are two main histological types of esophageal cancer: squamous cell carcinoma (SCC), which is associated with tobacco smoking and alcohol; and adenocarcinoma (AC), which is related to reflux disease and excess bodyweight (Carrao et al., 2004; Freedman et al., 2007; Boyle et al., 2008). SCC accounts for the vast majority of esophageal cancers diagnosed in low and middle income countries (Boyle et al., 2008). Squamous cell carcinoma comprised more than 99% of all esophageal cancers in our patients and this histological type is the prominent type in the Northeast of Iran (Anvari et al., 2011).

In summary, prognosis of esophageal cancer in North West of Iran is poor. Therefore, reduction in exposure to risk factors and early detection should be emphasized to improve survival (Mirinezhad et al., 2012).

According to the conducted studies, the high prevalence of cancer within digestive system in Ardabil province is evident and risk factors affecting the prevalence degree of esophageal cancer can be found in Ardabil province; so, this study attempted to investigate that the epidemiology of esophageal cancer in Ardabil province during study years.

Materials and Methods

This is a cross-sectional descriptive study that has been done on 661 patients in Ardabil province from March 2002 to May 2011. The necessary data collected by a checklist including age, gender, birthplace, residency (where they have spent most years of their life time), job, marital status, risk factors of disease (cigarette, alcohol drinks, and opium), tumor pathology, education, clinical symptoms, family history of cancer from Ardabil cancer registry center. The data were analyzed by statistical methods using SPSS 10 software.

Results

Six hundred sixty-one patients were registered as cases of esophageal cancer including 65.1% males and 34.9% females with a male to female ratio of 1/1.9. The incidence of cancer in male was 1.9 times higher than female which was statistically significant ($p=0.0001$) (Figure 1). 281 cases (42.5%) were urban and 380 cases (57.5%) were from rural area and the incidence of cancer in rural areas was 1.4 times more than urban areas which was statistically significant ($p=0.0001$) (Figure 2). From all patients, 522 people (79%) were married and 552 patients (83.5%) were illiterate. Among all esophagus cancer cases, 252 cases (38.1%) were farmers and 252 patient (38%) use smoking. In 648 patients (98%), the digestive symptoms and in 500 cases (75.6%) dysphasia was reported. Among 437 patients (66.1%), reflex symptom was mentioned.

Among 428 cases (64.8%), the symptom of heartburn

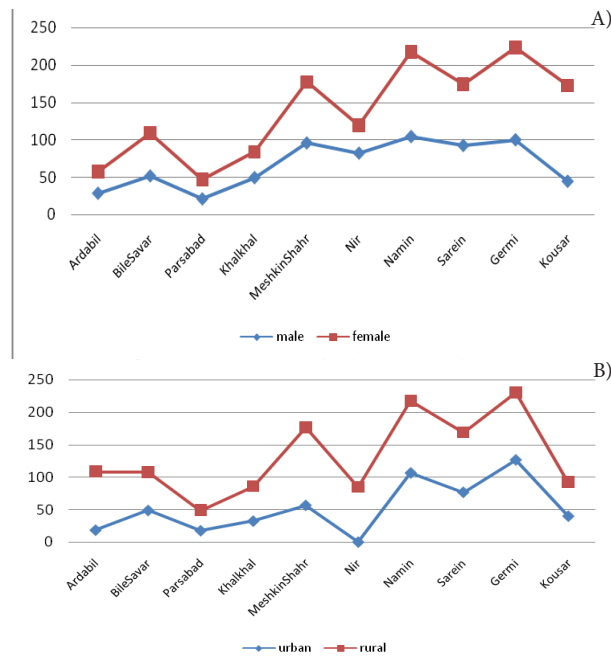


Figure 1. Incidence of Cancer. A) City and Sex. B) City and Residence Place

Table 1. Selected Demographic Characteristics of EC Patients

		N	(%)
Education	Illiterate	552	(83.5)
	Senior	86	(13)
	Undergraduate	22	(3.3)
	Unknown	1	(0.2)
	Job	Planter	252
	Farmer	64	(10)
	Worker	70	(10.6)
	Homemaker	187	(28.3)
	Other	82	(12.4)
	Unknown	4	(0.6)
Risk factors	Cigarette	280	(42.4)
	Opium	28	(4.2)
	Alcohol	9	(1.4)
Clinical symptoms	Dyspepsia	1	(0.2)
	Anorexia	8	(1.2)
	Nausea-vomiting	1	(0.2)
	Weight loss	206	(31.2)
	Others	4	(6.1)
	No Symptom	441	(66.7)

Table 2. Frequency Distribution of Tumor Site in Patients Suffering Esophagus Cancer

Tumor site	No.	%
Upper third of esophagus	7.1	47
Middle third of esophagus	43.3	286
Lower third of esophagus	30.2	200
Junctional	19.4	128
Total	100	661

was reported. Among 441 cases (66.7%), no specific symptom was reported (Table 1).

In 79 cases (12%), the bleeding symptom had been reported. In 117 cases (17.7%), the family history of cancer was mentioned. The type of tumor in 455 cases (68.8%) was SCC and 188 cases (28.5%) suffered adenocarcinoma (AC) and others' was unspecified. In 286 afflicted people

(43.3%), cancer had involved in the middle third of esophagus (Table 2).

Discussion

At the present study, 65.1% of affected people were male and 34.8% were female suggesting that the male were more affected than female which is consistent with the results found in previous studies conducted in Ardabil province and Caspian shores as well as other countries (Wild et al., 2003; Babaei et al., 2009; Lgissinov et al., 2012). In the studies previously done by Jalali et al., the affliction proportion in rural population to urban population is 2.3:1 (Jalali et al., 2005), however, at the present study, about 60% of affected people inhabit in rural areas which echoes the findings of previous studies (Babaei et al., 2009; Pourfarzi et al., 2011). But in Hajian study explored that more than 50% of affected people are living in cities based on the research done in Babolsar city (Hajian et al., 2003). In the current study, 38.1% of affected people were smoking which confirms findings of previous research, done in Japan with high incidence of gastric and esophageal cancers, arguing that the risk of cancer affliction in smoking people is 20 times more than nonsmoking ones. This percentage is so high in comparison with the results found in the research conducted in Caspian shores (7.9%) which can be considered as one of risk factors for esophagus cancer in Ardabil province. At the present study, 38.1% of patients were planters and 28.3% were homemakers being consistent with the results obtained in the study done in Caspian southern shores which indicated that the majority of affected men were planters and the majority of affected women were homemakers (Renehan et al., 2008). In this study, 60% of patients were from rural and 83.5% were illiterate and 50% involved farmers, concluding that the cancer manifestation has high prevalence in low economic and social classes which echo the results from studies done in Iran and other reference books which indicate that cancer prevalence is mostly observed in low classes (Wild et al., 2003).

However, at the present study, 68.8 % of patients suffer SCC and 3.8% suffer AC and 27.4% suffer other kinds of esophagus cancer which has differences with studies done in Caspian southeast shores including 37.7% SCC, 10.4% AC, and 15.9% other types of esophagus cancer (Semnani et al., 2004; Anvari et al., 2011; Ghanaei et al., 2012). The SCC manifestation was higher in this study in comparison with some similar studies conducted in other provinces. Regarding tumor site, 44.4% middle part of esophagus, 30.9% lower part of esophagus, 20.9% junction, and 6.9% upper thoracic have been involved. Pourfarzi proved that 44.1% lower part, 29.5% middle part, 22.4% upper part of esophagus has been involved (Pourfarzi et al., 2011). In the reference books, the esophagus tumor involvement in lower part, middle part, and upper part has been mentioned to be 55%, 35%, and 10%, respectively (Freedman et al., 2007), while the middle part of esophagus has been the tumor site in most cases. The cancer involvement site was middle third of esophagus, lower third of esophagus, upper thoracic, and finally the junction respectively and

the involvement of the middle third of esophagus was the most common case based on previous studies done in Ardabil province confirming the results pertained to the present study (Wild et al., 2003). Results showed that the prevalence and annual incidence rate of esophagus cancer in Ardabil province which is lower than country and the cancer is prevalent in male than female which have similar pattern compare to other places (Mashhadi et al., 2011; Mirineghad et al., 2012).

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