

RESEARCH COMMUNICATION

Epidemiology of Esophageal Lesions in Patients with Head and Neck Squamous Cell Carcinoma

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Abstract

Background: Esophageal squamous cell carcinoma (ESCC) is disturbing because of its aggressive clinical path and high mortality rate. The aim of this study was to investigate the characteristics of premalignant lesions and cancer of the esophagus in patients with a history of head and neck SCC. **Methods:** One hundred consecutive patients were investigated for diagnosis of superficial esophageal SCC. Lesions and their invasive depth for determination of the optimal method of treatment, and endoscopic examinations were carried out using Lugol chromoendoscopy. During endoscopy all abnormalities were investigated using approximately 10 ml of a 2% Lugol iodine solution sprayed over the entire esophageal mucosa using a spray catheter. **Results:** The mean±SD of age was 59.1±11.0 years. The tumor location in most patients (in both men and women) was the glottis. The statistical analysis showed significant differences between male and female in glottis and tongue. Twenty percent of patients reported the history of alcohol consumption and 22 percent were smokers, with 20.3% of men and 28.6% of women having digestive symptoms. The most common symptom in men was dysphagia and in women was odynophagia. **Conclusion:** In common, men are at high risk for ESCC and a high percent of current tobacco smokers, passive smokers and the history of alcohol intake were observed. In conclusion people in these high-risk groups would greatly benefit by acquisition of knowledge about and participating in a screening program.

Keywords:

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Introduction

Esophageal squamous cell carcinoma (ESCC) is disturbing because of its aggressive clinical path and high mortality rate. However, the prognosis of ESCC has been improving recently (Isono et al., 1991; Inoue, 1997; Ando et al., 2000; Takeshita et al., 1997). The prevalence rate of ESCC is vary according to geographical situation. In the high prevalent regions such as north of China, northeastern of Caspian Littoral in Iran and Transkei in south Africa, the prevalence of ESCC is raised from 100 persons to 100000 persons (Tadataka et al., 1999).

In order to detect esophageal SCC at an early stage, Lugol chromoendoscopy can visualize these dysplastic areas as Lugol-voiding lesions and has been widely used in high-risk populations because it is not ordinarily visible at routine endoscopy; (LVLs) (Mori et al., 1993; Shimizu et al., 2001). Lugol chromoendoscopy (LC), resulting in a dramatic increase in the number of superficial SCC detected (Sugimachi et al., 1988; Yokoyama et al., 1995; Dawsey et al., 1998).

In order to detect of ESCC, at an earlier stage with Lugol staining, Lugol chromoendoscopy is an effective technique to detection of abnormalities.

There are few studies on relationship between synchronous/metachronous ESCC and LVLs in patients with ESCC. We therefore investigated the characteristics of premalignant lesions and cancer of esophageal in patients with a history of head and neck SCC and the effect of LC in patients with ESCC.

Materials and Methods

One hundred consecutive patients were investigated for diagnosis of superficial esophageal SCC. The median age±SD of these patients was 62.9±11.7 years (range: 26 to 91 including 128 male and 29 female). In order to more specifically diagnose the extent of the SCC lesions and their invasive depth for determination of the optimal method of treatment, endoscopic examinations were carried out using Lugol chromoendoscopy. During endoscopy processing all abnormalities were investigated using approximately 10 ml of a 2% Lugol iodine solution was sprayed over the entire esophageal mucosa using a spray catheter and esophagus was inspected again.

The mucosal biopsy specimens were collected from all lesions that remain definitely unstained by Lugol. If their greatest diameter was smaller than 1 cm, two biopsies

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were obtained and if it was more than 1 cm, 4 biopsies were obtained from lesions. At the end of the screening procedure, esophageal mucosa was rinsed with 20mL of 2.5% sodium thiosulfate solution and the gastric contents were removed by suction.

The obtained samples were reviewed by an expert pathologist. Written informed consent was obtained from all patients before their examinations. For tumor location, the esophagus was divided into 5 regions: the cervical esophagus, the upper thoracic esophagus, the middle thoracic esophagus, the lower thoracic esophagus, and the abdominal esophagus.

The location and stage of HNSCC are stated in Table 1. The distribution of HNSCC localization was 37.9% oral cavity, 19.9% larynx, 17.4% oropharynx, and 14.9% hypopharynx.

Statistical analysis was performed using Fisher exact test. A P value of less than 0.05 was considered statistically significant.

Results

The total of 100 patients (79% men, 21% women) included in this study. The mean±SD of age was 59.1±11.0 years (60±10.9 for men, 55.7±10.7 for women). There was no statistically difference between men and women's age (P=0.11).

The pathological and clinical findings regarding the patients were appeared in Tables 1 and 2. The location of tumor in most patients (in both men and women) is glottis. The statistical analysis showed a significant difference between male and female in glottis and tongue. 20 percent

Table 1. Distribution of SCC Location According to Gender (%)

	Male	Female	Total	P-value
Supraglottis	20.3	9.5	18.0	0.35
Hypopharynx	8.9	19.0	11.0	0.23
Glottis	70.9	28.6	62.0	0.001
Palate	2.5	9.5	4.0	0.19
Subglottis	2.5	0.0	2.0	1.00
Lip	3.8	0.0	3.0	1.00
Alveolar	0.0	4.8	1.0	0.21
Tonsil	2.5	0.0	2.0	1.00
Buccal	0.0	4.8	1.0	0.21
Tongue	2.5	28.6	8.0	0.001

Table 2. Clinical and Endoscopy Findings in Patients with SCC According to Gender

	Male	Female	Total	P-value
Digestive symptom	20.3	28.6	22.0	0.39
Abdominal pain	5.1	4.8	5.0	1.00
Odynophagy	10.1	19.0	12.0	0.27
Dysphagy	11.4	9.5	11.0	1.00
Surgery	96.2	100.0	97.0	1.00
Radiotherapy	34.2	61.9	40.0	0.026
Endoscopy finding	58.2	47.6	56.0	0.46
Secondary tumor	3.8	0.0	3.0	1.00
Barrete esophagus	0.0	0.0	0.0	...
Esophagitis	21.5	23.8	22.0	0.77
Erosive gastrodeodentitis	6.3	9.5	7.0	0.63

of patients reported the history of alcohol consumption and 22 percent were smokers. 20.3% of men and 28.6% of women had digestive symptoms respectively. Among them the most common symptom in men was dysphagy and in women was odynophagy. In the endoscopy procedure, the most finding in both genders was esophagitis (22%) followed by secondary tumor (3%). On the other hand Barretts esophagus was not detected in any patients.

Discussion

The incidence of esophageal cancer in Iran have variable rates, ranging from 3 to more than 15 cases per 100,000 population, but rates have decreased sharply in the high incidence areas (Mosavi-Jarrahi, 2006).

In common, men are at high risk for ESCC. However, some studies such as Islami et al study has controversial results and say that the male to female ratio is close to one (Islami et al., 2009). Smoking, drinking hot tea, and exposure to polycyclic aromatic hydrocarbons, alcohol consumption, general nutrition deficiencies are as important risk factors as in Western countries as well as some parts of Iran however, Smoking and alcohol consumption have been investigated in detail (Alcohol, 1989; Tobacco smoke and involuntary smoking, 2004; Kamangar et al., 2007; Hakami et al., 2008).

It is well known that patients with ESCC often have synchronous and metachronous pharyngeal SCC (Shimizu et al., 2001). Our study indicated a high percent of current tobacco smokers and also passive smokers among patients under study. Besides up to 20% of patients reported the history of alcohol intake which is a remarkable prevalence of alcohol consumption in Iranian society. Tobacco smoking and alcohol use are strong risk factors for esophageal squamous cell carcinoma (Day et al., 1996), whereas smoking is only weakly related to adenocarcinomas in the lower stomach (Nomura et al., 1996). Several studies (Wu-Williams et al., 1990; Gray et al., 1992; Newcombe and Carbone, 1992; Palli et al., 1992; Kabat et al., 1993; Brown et al., 1994; Gonzalez et al., 1994; Vaughan et al., 1995; Ji et al., 1996; Garidou et al., 1996; Zhang et al., 1996) have reported only a slight excess in risk of esophageal or gastric cardia adenocarcinomas associated with smoking and drinking.

Few effective screening and follow-up strategies have been developed, however, and head and neck SCC is usually diagnosed at an advanced stage with a resultant poor prognosis (Kraus et al., 1997; Wahlberg, 1998; Johansen et al., 2000; Erkal et al., 2001; Eckel et al., 2001; Muto et al., 2004). People in these high-risk groups would be greatly benefited by the acquisition of this knowledge and participating in a screening program.

References

- Ando N, Ozawa S, Kitagawa Y, et al (2000). Improvement in the results of surgical treatment of advanced squamous esophageal carcinoma during 15 consecutive years. *Ann Surg*, **232**, 225-32.
- Alcohol drinking. IARC Working Group, Lyon, 13-20 October 1987. IARC Monogr Eval Carcinog Risks Hum 1988, **44**,

- 1-378.
- Brown LM, Silverman DT, Pottern LM, et al (1994). Adenocarcinomas of the esophagus and esophagogastric junction in white men in the United States: alcohol, tobacco, and socioeconomic factors. *Cancer Causes Control*, **5**, 333-40.
- Dawsey SM, Fleischer DE, Wang GQ, et al (1998). Mucosal iodine staining improves endoscopic visualization of squamous dysplasia and squamous cell carcinoma of the esophagus. *Cancer*, **83**, 220-31.
- Day NE, Munoz N (1996). Esophagus. In: Schottenfeld D, Fraumeni JF, editors. *Cancer epidemiology and prevention*. New York, *Oxford Univ Press*, 681-706.
- Eckel HE, Staar S, Volling P, et al (2001). Surgical treatment for hypopharynx carcinoma: feasibility, mortality, and results. *Otolaryngol Head Neck Surg*, **124**, 561-9.
- Erkal HS, Mendenhall WM, Amdur RJ, et al (2001). Synchronous and metachronous squamous cell carcinomas of the head and neck mucosal sites. *J Clin Oncol*, **19**, 1358-62.
- Garidou A, Tzonou A, Lipworth L (1996). Life-style factors and medical conditions in relation to esophageal cancer by histologic type in a low-risk population. *Int J Cancer*, **68**, 295-9.
- Gray JR, Coldman AJ, MacDonald WC (1992). Cigarette and alcohol use in patients with adenocarcinoma of the gastric cardia or lower esophagus. *Cancer*, **69**, 2227-31.
- Gonzalez CA, Agudo A, Montes J, et al (1994). Tobacco and alcohol intake in relation to adenocarcinoma of the gastric cardia in Spain. *Cancer Causes Control*, **5**, 88-9.
- Hakami R, Mohtadinia J, Etemadi A, et al (2008). Dietary intake of benzo(a)pyrene and risk of esophageal cancer in North of Iran. *Nutr Cancer*, **60**, 216-21.
- Inoue H (2001). Treatment of esophageal and gastric tumors. *Endoscopy*, **33**, 119-25.
- Islami F, Malekshah AF, Kimiagar M, et al (2009). Patterns of food and nutrient consumption in northern Iran, a high-risk area for esophageal cancer. *Nutr Cancer*, **61**, 475-83.
- Isono K, Sato H, Nakayama K (1991). Results of a nationwide study on the three-field lymph node dissection of esophageal cancer. *Oncology*, **48**, 411-20.
- Ji BT, Chow WH, Yang G, et al (1996). The influence of cigarette smoking, alcohol, and green tea consumption on the risk of carcinoma of the cardia and distal stomach in Shanghai, China. *Cancer*, **77**, 2449-57.
- Johansen LV, Grau C, Overgaard J (2000). Hypopharyngeal squamous cell carcinoma treatment results in 138 consecutively admitted patients. *Acta Oncol*, **39**, 529-36.
- Kabat GC, Ng SK, Wynder EL (1993). Tobacco, alcohol intake, and diet in relation to adenocarcinoma of the esophagus and gastric cardia. *Cancer Causes Control*, **4**, 123-32.
- Kamangar F, Malekzadeh R, Dawsey SM, et al (2007). Esophageal cancer in northeastern Iran: a review. *Arch Iran Med*, **10**, 70-82.
- Kraus DH, Zelefsky MJ, Brock HA, et al (1997). Combined surgery and radiation therapy for squamous cell carcinoma of the hypopharynx. *Otolaryngol Head Neck Surg*, **116**, 637-41.
- Mosavi-Jarrahi A, Mohagheghi MA (2006). Epidemiology of esophageal cancer in the high-risk population of Iran. *Asian Pac J Cancer Prev*, **7**, 375-80.
- Mori M, Adachi Y, Matsushima T, et al (1993). Lugol staining pattern and histology of esophageal lesions. *Am J Gastroenterol*, **88**, 701-5.
- Muto M, Nakane M, Katada C, et al (2004). Squamous cell carcinoma in situ at oropharyngeal and hypopharyngeal mucosal sites. *Cancer*, **101**, 1375-81.
- Newcombe PA, Carbone PP (1992). The health consequences of smoking. *Med Clin North Am*, **76**, 305-31.
- Nomura A (1996). Stomach. In: Schottenfeld D, Fraumeni JF Jr., editors. *Cancer epidemiology and prevention*. New York: Oxford Univ Press, 707-24.
- Palli D, Bianchi S, Dacarli A, et al (1992). A case-control study of cancers of the gastric cardia in Italy. *Br J Cancer*, **65**, 263-6.
- Sugimachi K, Ohno S, Matsuda H, et al (1988). Lugol-combined endoscopic detection of minute malignant lesions of the thoracic esophagus. *Ann Surg*, **208**, 179-83.
- Shimizu Y, Tukagoshi H, Fujita M, et al (2001). Endoscopic screening for early esophageal cancer by iodine staining in patients with other current or prior primary cancers. *Gastrointest Endosc*, **53**, 1-5.
- Tadataka Yamada, et al (1999). Text book of gastroenterology, esophageal neoplasms, Lippincott Williams & Wilkins. 1278-86.
- Takehita K, Tani M, Inoue H, et al (1997). Endoscopic treatment of early oesophageal or gastric cancer. *Gut*, **40**, 123-7.
- Tobacco smoke and involuntary smoking (June 2002). IARC monographs on the evaluation of the carcinogenic risks to humans 2004, volume 83.
- Vaughan TL, Davis S, Kristal A, et al (1995). Obesity, alcohol, and tobacco as risk factors for cancers of the esophagus and gastric cardia: adenocarcinoma versus squamous cell carcinoma. *Cancer Epidemiol Biomarkers Prev*, **4**, 85-92.
- Wahlberg PC, Andersson KE, Björklund AT, et al (1998). Carcinoma of the hypopharynx: analysis of incidence and survival in Sweden over a 30-year period. *Head Neck*, **20**, 714-9.
- Wu-Williams AH, Yu MC, Mack TM (1990). Life-style, workplace, and stomach cancer by subsite in young men of Los Angeles County. *Cancer Res*, **50**, 2569-76.
- Yokoyama A, Ohmori T, Makuuchi H, et al (1995). Successful screening for early esophageal cancer in alcoholics using endoscopy and mucosa iodine staining. *Cancer*, **76**, 928-34.
- Zhang ZF, Kurtz RC, Sun M, et al (1996). Adenocarcinomas of the esophagus and gastric cardia: medical conditions, tobacco, alcohol, and socioeconomic factors. *Cancer Epidemiol Biomarkers Prev*, **5**, 761-8.