

## RESEARCH ARTICLE

# Prevalence of Esophageal Cancer in the Northern Part of Afghanistan

Mohammad Shoaib Hamrah<sup>1</sup>, Mohammad Hashem Hamrah<sup>2</sup>, Mirwais Rabi<sup>3</sup>, Hong Xian Wu<sup>1</sup>, Chang-Ning Hao<sup>1</sup>, Mohammad Harun-Or-Rashid<sup>4</sup>, Junichi Sakamoto<sup>5</sup>, Hideki Ishii<sup>1\*</sup>

### Abstract

**Background:** Esophagogastroduodenoscopy (EGD) is the standard technique for diagnosis of patients presenting with upper gastrointestinal symptoms. Some reports have shown high prevalence of esophageal cancer in the northern part of Afghanistan. The aim of this study was to investigate epidemiological profile of esophageal cancer among patients in this region. **Materials and Methods:** We identified 364 consecutive patients that received EGD examinations to examine upper gastrointestinal tract at the endoscopy unit of Balkh regional Hospital from March 2012 to March 2013. The case subjects included both in-patients and out-patients aged 16 years or more. We evaluated the results retrospectively. **Results:** The cases consisted of 184 (51%) males and 180 (49%) females. The mean age was  $47.3 \pm 17.8$  and the age range 17-88 years. Ninety two cases had esophageal cancer, out of which 58 (63.0%) were male. The mean age at time of diagnosis was  $57.8 \pm 13.2$  years. Uzbek-Turkmen peoples were more common among patients with esophageal cancer (52.2%). Dysphagia was the most frequent symptom among patients with esophageal cancer at the time of presentation, seen in 77 (84.8%) of cases. **Conclusions:** Our results showed high incidence of esophageal cancer in the northern part of Afghanistan, especially in the Uzbek-Turkmen ethnic group.

**Keywords:** Esophagus cancer - endoscopy - northern part of Afghanistan - ethnicity

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### Introduction

Esophagogastroduodenoscopy (EGD) is a standard and established upper gastrointestinal endoscopy technique that visually examines lining of gastrointestinal tract from esophagus through stomach, duodenal bulb and descending small intestine (Nguyen et al., 2010). EGD has become more and more popular in the past 40 years with increasing frequency for examination of the upper gastrointestinal symptoms (McCull et al., 2002; Chan et al., 2004). The aim of EGD is to help both physician and patient to evaluate and to understand clinical symptoms besides acting as a tool to prove the presence of peptic ulcer or tumors (Maarros et al., 2004).

There are a lot of differences in distribution of gastrointestinal diseases among different population. Esophageal cancer shows a specific geographical distribution that distinguishes it from other malignancies. Very high rates of esophageal cancer have been reported in several other areas of Central and East Asia including

the northern part of Afghanistan (Mir et al., 2009). Several statistics have shown that esophageal cancer is one of the 10 most common cancers, and sixth most common cause of cancer deaths worldwide (Ghavamzadah et al., 2001; Rasouli et al., 2011). It is the fourth most common gastrointestinal cancer after gastric, colorectal and hepatocellular cancers (Mashhadi et al., 2011). Squamous cell carcinoma of esophagus is a common type of esophageal tumor (Amini et al., 2014); of which more than 80% of cases and deaths occur in developing countries (Igissinov et al., 2012; Kiadaliri, 2014). This is a unique epidemiological feature that differentiated it from other cancer types. The contrast variation of 3/100,000 per year in western countries and 140/100,000 per year in Central Asia (Alidina et al., 2004) is a remarkable need for more researches to identify factors of the high incidence rate. Esophageal cancer stretches eastward through Asian Esophagus Cancer Belt in the region of Central Asia, from Iran through Turkmenistan, Northern Afghanistan, Uzbekistan, and Kazakhstan to Northern China (Mir et al.,

<sup>1</sup>Department of Cardiology, Nagoya University Graduate School of Medicine, Nagoya, <sup>5</sup>Tokai Central Hospital, Kakamigahara, Japan, <sup>2</sup>Dr. Mohammad Hashem Hamrah's Curative Clinic, Andkhoy, <sup>3</sup>Balkh Regional Hospital, Mazar-i-Sharif, Afghanistan, <sup>4</sup>Ministry of Health and Family Welfare of Bangladesh, Dhaka, Bangladesh \*For correspondence: [hkishi@med.nagoya-u.ac.jp](mailto:hkishi@med.nagoya-u.ac.jp)

2009; Igissinov et al., 2013). Afghanistan, especially the northern region falls under the Asian Esophagus Cancer Belt and is well known with high incidence rate of the disease (Sobin, 1969; Ghazzawi et al., 2004).

Some studies showed high prevalence of esophageal cancer in the northern part of Afghanistan. However, there has been still limited data; the purpose of this study was to perform an additional investigation to determine the epidemiology profile of esophageal cancer in the region.

## Materials and Methods

Three hundred sixty four consecutive patients were included in this study who received EGD examination at Balkh regional hospital from March 2012 to March 2013. The case subjects included both inpatient and outpatient of age 16 years or more.

The examinations were performed with pharyngeal spray lignocaine as local anesthesia. The procedures were done with a fibro-optic endoscope without sedation in dedicated endoscopy unit. The endoscopic facility served both inpatient and outpatients. The study was endoscopy-based diagnostic methods and is considered the gold standard in diagnosing esophageal cancer. Demographic characteristics, clinical presentations, and endoscopic findings were examined.

Data are presented as mean±standard deviation. Categorical variable are expressed as count and percentages. Continuous data were compared by using unpaired t test. Categorical data were compared by means of X<sup>2</sup> test. p value<0.05 was considered statistically significant. All analyses were performed using the SPSS 18.0 software package (SPSS, Chicago, IL). The study was approved by the scientific review committee of Balkh regional hospital.

## Results

Baseline clinical characteristics in all patients are shown in Table 1. Of these patients, 184 were male (51%) and 180 were female (49%). The mean age of the patients was 47.3±17.8 and the age range 17-88 years. Two hundred forty patients (66%) were out-patient and 124 patients were in-patient (34%).

The main clinical presentations were dysphagia in 77 patients (21%), epigastric pain in 69 patients (19%), and

**Table 1. Demographic Characteristics of All Patients**

|                             |           |     |
|-----------------------------|-----------|-----|
| Mean age±SD                 | 47.3±17.8 |     |
| Age range                   | 17-88     |     |
| Gender Male, n (%)          | 184       | 51% |
| Female, n (%)               | 180       | 49% |
| Ethnicities                 |           |     |
| Uzbeks-Turkmen, n (%)       | 111       | 30% |
| Tajiks, n (%)               | 154       | 42% |
| Pashtoons, n (%)            | 46        | 13% |
| Hazaras, n (%)              | 53        | 15% |
| Outpatient vs Inpatient     |           |     |
| Outpatient, n (%)           | 240       | 66% |
| Inpatient, n (%)            | 124       | 34% |
| Main Clinical Presentations |           |     |
| Dysphagia                   | 77        | 21% |
| Epigastric pain             | 69        | 19% |
| Chest pain                  | 52        | 14% |
| Melana                      | 45        | 12% |
| Anemia                      | 31        | 9%  |
| Nausea                      | 32        | 9%  |
| Vomiting                    | 23        | 6%  |
| Heart burn                  | 16        | 4%  |
| Weight loss                 | 10        | 3%  |
| Hematemesis                 | 9         | 2%  |

\*n=364

**Table 2. Main Endoscopic Findings**

| Endoscopic findings     | n=364 | %      |
|-------------------------|-------|--------|
| 1-Normal                | 51    | 14.00% |
| 2-Esophageal Cancer     | 92    | 25.30% |
| 3-Gastric Cancer        | 13    | 3.60%  |
| 4-Duodenal Cancer       | 2     | 0.50%  |
| 5-Other benign findings | 206   | 56.70% |

chest pain in 52 patients (14%).

The EGD findings are shown in Table 2. A total of 92 cases had esophageal cancer (25%), gastri and duodenal cancerwrs also being found.

Table 3 shows the comparison between the patients with esophageal cancer and without esophageal cancer. The patients with esophageal cancer were older than those without esophageal cancer (57.8±13.2 vs 43.7±17.7, p<0.01), the rate of males was higher (63% vs 43%, p=0.006). The Uzbek-Turkmen was more common among the patients with esophageal cancer (48/92:52.2%). Dysphagia was the most frequent symptom among patients with esophageal cancer at time of presentation, seen in 77 (84.8%) of cases.

**Table 3. Comparison between the Patients with and without Esophageal Cancer**

|                                   | Esophageal Ca (+)<br>n=92 | Esophageal Ca (-)<br>n=272 | p-value     |
|-----------------------------------|---------------------------|----------------------------|-------------|
| Age, y                            | 57.8±13.2                 | 43.7±17.7                  | <0.001      |
| Male, n (%)                       | 58 (63.0%)                | 126 (46.3%)                | 0.006       |
| Ethnicity, n (%)                  |                           |                            | <0.001      |
|                                   | Uzbeks-Turkmen            | 48 (52.2%)                 | 63 (23.2%)  |
|                                   | Tajiks                    | 25 (27.2%)                 | 129 (47.4%) |
|                                   | Pashtoons                 | 7 (7.6%)                   | 39 (14.3%)  |
|                                   | Hazaras                   | 12                         | 41 (15.1%)  |
|                                   |                           | -13.00%                    |             |
| Main clinical presentation, n (%) |                           |                            |             |
|                                   | Dysphagia                 | 77 (83.7%)                 | 0 (0%)      |
|                                   | Weight loss               | 8 (8.7%)                   | 2 (0.7%)    |
|                                   | Outpatient, n (%)         | 53 (57.6%)                 | 187(68.8%)  |
|                                   |                           |                            | 0.051       |

## Discussion

The high incidence rates of esophageal cancer were observed among patient in this region especially in the Uzbek-Turkmen and predominantly with symptom of dysphagia. Previous study of esophageal cancer in Jordanian field hospital in the northern part of Afghanistan has reported similar finding (Ghazzawi et al., 2004). However, the incidence of esophageal cancer is low in western countries compared to Asian countries (Bloomfield et al., 2006). The high rates of esophageal cancer in the northern part of Afghanistan reflected that this area lies in Central Asian Esophageal Cancer Belt (Mir et al., 2009; Mansour-Ghanaei et al., 2012). This shows the variable geographic distribution of esophageal cancer which might due to many known and unknown environmental and ethnic reasons.

The esophageal cancer male to female ratio found in this study was 1.8:1, which is similar to the ratio reported in several studies done in north and northeast of Iran (Ghavamzadeh et al., 2001), Kazakhstan, Turkmenistan, and Uzbekistan (Melhado et al., 2010). However, a study found conversely in western countries where the rate is several times higher in male than female (Islami et al., 2004). Despite the common presumption that smoking and alcohol intake are the main risk factors of esophageal cancer in some areas, this disease displayed a unique epidemiological feature whereby female has the similar risk as male. This pattern was also observed in Linxian, China (Islami et al., 2009).

In our study, Uzbek-Turkmen ethnic group has the highest incidence of esophagus cancer. Insight to the custom of Uzbek-Turkmen people in northern part of Afghanistan, they like to drink tea at rather high temperature and eat solid food together with boiling fluids (Sobin, 1969). Islami et al. (2009) suggested that the common hot beverages or fluids consumption in both sexes may have a role in carcinogenesis of esophageal cancer. Correlation between drinking hot beverages and risk of esophageal cancer has been demonstrated in many studies from different part of the world (De Jong et al., 1974; Launoy et al., 1997; Castellsague et al., 2000; Mir et al., 2009; Rasouli et al., 2011). It is believed that this long lasting and spontaneous thermal irritation is likely to damage the esophagus and may facilitate carcinogen through the esophagus lining (Sadjadi et al., 2010). Moreover, phenol content in the tea was reported to have cancer-promoting effects (Kaiser, 1967).

A study done in the northern part of Afghanistan showed high esophageal cancer incidence rate in the Uzbek-Turkmen ethnicity, outlying other ethnicities (Sobin, 1969). This ethnic group and geographical distribution agrees with our observations from this study and other studies of neighboring Esophagus Cancer Belt countries including Turkmenistan, Uzbekistan, Karakalpakstan and Kazakhstan (Saenko et al., 1975; Zaridze et al., 1978; Kairakbaev et al., 1992). Nevertheless, Turkmen ethnicity who resides adjacent to Afghanistan and Turkmenistan was found to have the highest esophageal cancer risk in northeastern part of Iran (Kamangar et al., 2007).

Besides smoking and alcohol drinking, environmental

and genetic factors are also presumed to play a role in the carcinogenesis of esophageal cancer, particularly for squamous cell carcinoma of the esophagus (Kamangar et al., 2009). In some studies, it is advocated that genetic factors have higher influence in changing the vulnerability to endogenous and exogenous carcinogenic factors, as compared to widely variable lifestyle and habits (Wang et al., 2007; Ganesh et al., 2009). Whereas, the environmental carcinogens link to genetic factors through irreversible changes and trigger mutations which lead to cancer development (Bartsch et al., 2000; Hecht et al., 2001). Nonetheless, interactions between environmental and genetic factors have been suggested as subjective to individual, whereby genetically susceptible individual would be at higher risk than less-susceptible individual when exposed to moderate intensities of environmental risk factors (Marjani et al., 2010). Studies in the region from China through Central Asian republics toward northeastern part of Iran found positive relationship between genetic factors and the prevalence of esophageal cancer and especially high incidence rates were reported among population with the so-called "Mongolian phenotype" genes type (Kamangar et al., 2007). Although no study on association of high-penetrance germline mutations with SCCE risk at time, somatic mutation in TP53 and other tumor suppressor genes have been extensively studied in SCCE tumors. The study of 98 ESCC tumor samples obtained from hospitals in Tehran that found TP53 mutations among half of the tumors. (Sephehr et al., 2001).

According to the result of our study, the median age at diagnosis of esophageal cancer was 60 years (range 17-88). The median age at presentation of esophageal cancer is 72 years in Scotland (Alidina et al., 2004). Therefore, this cancer is a disease of the younger age group in the northern part of Afghanistan.

In our study, dysphagia was the most frequent symptom observed among patients with esophageal cancer at the time of examination. This could be justified by locally advanced esophageal cancer where the esophagus obstructed by the tumor and causes progressive solid food dysphagia which often accompanied by weight loss.

Limitations identified in this study are the retrospective review protocol of the medical records. At time, there were no stratified ethnic groups and residential regions cancer registration available to investigate this issue. Furthermore, the diagnosis of esophageal cancer was completely based on endoscopy finding because the histopathological examination was inaccessible in this region. Moreover, there were the lack of data on laboratory examination, and several established risk factors including chewing a mixture of tobacco and lime is common habit throughout the country in both sexes and one associated with high level of esophageal cancer in some other countries. Also the sample size was a relatively small. However, there are limited data about the esophageal cancer among the Afghan population living in the northern part, and our results would be of benefit to accumulate data regarding this issue.

We concluded that our results confirmed the high incidence of esophageal cancers in the northern part

of Afghanistan, especially in Uzbek-Turkmen ethnic group. Therefore, more frequent EGD screening might be imperative for early detection of esophageal cancer especially in those high risk population.

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