

Epidemiological investigation of esophageal carcinoma

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Abstract

AIM: To review the characteristics of esophageal carcinoma in recent 30 years in the epidemiological investigation.

METHODS: A total of 1 520 cases of esophageal carcinoma in the First Affiliated Hospital of Zhejiang University Medical College admitted from 1970 until now were reviewed. Their age, gender, position of carcinoma and histological type were analyzed.

RESULTS: The morbidity of esophageal carcinoma was increasing during the observation period. Compared with the 1970s (9.5%), the ratio of adenocarcinoma significantly increased after the 1980s (19.1%). The difference was significant ($P \leq 0.05$).

CONCLUSION: The morbidity of esophageal adenocarcinoma was increasing and advanced clinical study should be strengthened.

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INTRODUCTION

Carcinoma of esophagus is one of the most common cancers with a high mortality. Squamous cell carcinoma and adenocarcinoma account for more than 95% of esophageal tumors^[1]. The incidence rate of squamous cell carcinoma of the esophagus in the pathological feature is more frequent compared with adenocarcinoma. Increasing prevalence of adenocarcinoma of the esophagus has been reported from western countries in recent years and its incidence since the 1970s in China is unknown. Our study aimed to make an epidemiological investigation of carcinoma of esophagus and compare the incidence rate of adenocarcinoma and squamous cell carcinoma of the esophagus.

MATERIALS AND METHODS

Medical records of all patients ($n=1\ 520$) with adenocarcinoma or squamous cell carcinoma of the esophagus seen at the the First Affiliated Hospital of Zhejiang University Medical College between 1970 and 2001 were reviewed. The following data were retrieved: age, gender, tumor location, history of surgery and pathological features. The patients were divided into 3 groups:

group A (211 patients) were patients seen from 1970 to 1979, group B (451 patients) were patients from 1980 to 1989 and group C (858 patients) were from 1990 to 2001.

RESULTS

The data of the 1520 patients with adenocarcinoma or squamous cell carcinoma were analyzed. Among them, 236 (15.5%) were female and 1 284 (84.5%) were male. In group A there were 184 (87.2%) male patients and 27 (12.8%) female patients, in group B there were 380 (84.3%) male and 71 (15.7%) female, in group C there were 720 (83.9%) male and 138 (16.1%) female. No differences were found between the groups in gender. Among 240 cases of adenocarcinoma of esophagus, 195 (81.3%) were male and 45 (18.7%) were female. And among 1280 cases of squamous cell carcinoma of the esophagus, 1 089 (85.1%) were male and 191 (14.9%) were female. No significant difference of sex ratios were found in patients with adenocarcinoma of esophagus and squamous cell carcinoma of the esophagus.

The age distribution of the patients is shown in Table 1. Patients in their 50s are at highest risk for carcinoma of the esophagus in the 1970s. And patients in their 60s are at highest risk for carcinoma of the esophagus since 1980s.

From clinical pathological data, 20, 80, 134 cases with adenocarcinoma and 191, 365, 724 cases with squamous cell carcinoma were found in groups A, B, C, respectively. The proportion of esophageal adenocarcinoma of all groups were 9.5% (20/211), 19.1% (86/451) and 15.6% (134/858), respectively. The difference was significant between groups A and B ($P=0.002$) and also between groups A and C ($P=0.023$). And there was no significant difference between groups B and C ($P=0.113$).

We investigated the location of adenocarcinoma of esophagus (193 cases), whose pathological findings showed the definite location. Two (1.0%) cases were located at the upper esophagus, 15 (7.8%) at the middle and 176 (91.2%) located at the lower esophagus.

Table 1 Age distribution of all patients with carcinoma of esophagus: n (%)

Age (yr)	A	B	C
≤ 30	3 (1.4)	2 (0.4)	5 (0.6)
30-	15 (7.1)	20 (4.3)	26 (3.0)
40-	47 (22.3)	72 (16.0)	162 (18.9)
50-	103 (48.8)	160 (35.5)	250 (29.1)
>60	43 (20.4)	197 (43.7)	415 (48.4)

DISCUSSION

Esophageal cancer is one of the most deadly forms of gastrointestinal cancer in China and death rate from carcinoma of esophagus ranked the third annually. Epidemiological data defined a certain geographical distribution^[2]. In high mortality areas of China, Iran and Africa, the incidence of esophageal tumors is approximately equal in men and women^[3]. By comparison, in low-incidence regions such as the United States and parts of Europe, there is a significant predilection for males^[4]. It was reported that the incidence rate in male is higher than that of female, and the sex ratios (male/female) was 5-10:1. In our study, the male to female

ratio was 5.5:1 and the difference was not significant among groups.

Although squamous cell carcinoma was traditionally considered synonymous with esophageal cancer, the incidence of adenocarcinoma of the esophagus is increasing in most Western industrialized nations in recent years^[5,6]. The incidence of esophageal adenocarcinoma increased from 1.5 to 7.0 per 100 000 men and from 0.4 to 1.5 per 100 000 women between 1971 and 1998 in England and Wales^[7]. The proportion of adenocarcinomas has increased, probably in connection with the increasing incidence of Barrett's esophagus. But the risk of Barrett's esophageal mucosa advancing to esophageal adenocarcinoma is not well established^[8]. Even though the incidence of esophageal adenocarcinoma has been rising in Western populations over the past two decades and squamous cell carcinoma has been declining^[9,10], esophageal squamous cell carcinoma remains the predominant type of esophageal malignancy in the remainder of the world.

The mechanism of increased incidence of adenocarcinoma remained to be unclear. Gastroesophageal reflux disease (GERD), Barrett's esophagus, smoking, alcohol drinking and dysfunction of esophageal motility may be associated with the increase of incidence of adenocarcinoma. Adenocarcinoma is an uncommon cause of mortality in patients with Barrett's esophagus. Forty-four patients were confirmed to have Barrett's esophagus and were followed up for 209 patient-years. Only 2 patients developed esophageal adenocarcinoma, resulting in an incidence of one case in 209 patient-years, a 55-fold risk compared with age- and sex-matched population in Scotland^[11]. Gastric juice that refluxes into the esophagus can injure esophageal squamous epithelium. When the injury heals through a metaplastic process in which an abnormal columnar epithelium replaces the injured squamous one, the resulting condition is called Barrett's esophagus^[12]. Barrett's esophagus is the major risk factor for the development of esophageal adenocarcinoma, which is increasing in incidence faster than any other cancer in the Western world. Barrett's adenocarcinomas are increasing in epidemic proportions for as yet unknown reasons, approximately 0.5-1% of patients with Barrett's will develop adenocarcinoma^[13,14]. Although GERD symptoms precede the development of adenocarcinoma of esophagus in many patients, fewer than 50% of patients have pathologic evidence of esophagitis or Barrett's epithelium at presentation.

There are clear racial, gender and site predilections for esophageal adenocarcinoma^[15,16]. Our study demonstrated that 176 cases (91.2%) of adenocarcinoma of esophagus were located at the lower esophagus, being different from squamous cell carcinoma of the esophagus which were located mainly at the middle of the esophagus. Adenocarcinoma of esophagus shared with the same location with Barrett's esophagus.

Further study is required to determine the risk factors such

as food^[17] for the development of esophageal cancer and epidemiological investigation will prove important developing methods of detection and therapeutic intervention of this disease.

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