The characteristics of oesophageal squamous cell carcinoma: an analysis of 1317 cases in southeastern China

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Aim of the study: To research the demographic and histopathological features of ESCC in southeastern China.

Material and methods: We retrospectively reviewed the ESCC cases in the biobank of the National Engineering Centre for Biochip in Shanghai, which cooperates with lots of hospitals and research institutions in southeastern China. The patients were pathologically confirmed as having ESCC. The demographic and histopathological features of these cases were analysed subsequently.

Results: A total of 1317 patients were enrolled. The overall male : female ratio was 2.88 : 1. 74.34% of these cases occurred in people aged between 50–70 years. Dysphagia was the most common symptom, which accounted for 93.40% of all the patients. Stage II and III were predominant (79.73%). 72.89% of patients had a tumour length greater than 3 cm. Most of the tumours (65.83%) were located in middle third of the oesophagus. There was a significant difference among the tumour stage, length, and location in different sex groups ($P < 0.05$), but not between different age groups ($P > 0.05$). In males, ESCC is usually located in the lower parts, with a longer tumour length and higher tumour stage. 24.15% of patients had lymph nodes ratio (LNR) > 0.2.

Conclusions: In our analysis, dysphagia was more common in ESCC patients, to whom more attention should be paid. Additionally, males had a higher incidence, with longer and more distant disease, which gives a poor prognosis.

Key words: oesophageal squamous cell carcinoma, ESCC, characteristics, southeastern China.

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Introduction

Oesophageal cancer is the eighth most common cancer and the sixth leading cause of cancer death in the world. In 2002 there were an estimated 462,000 new cases (4.2% of the total) and 386 000 deaths (5.7% of the total) attributable to oesophageal cancer worldwide [1]. It is primarily composed of two histologic types: squamous cell carcinoma (ESCC) and adenocarcinoma (EA), each apparently having a distinct aetiology [2]. Even though the incidence rate for EA has risen rapidly in the USA and Western Europe [3–5], ESCC is still the predominate type, especially in Asian countries [6–9]. ESCC is related to a variety of factors, such as trace elements [10]. A unique epidemiological feature of oesophageal cancer is its disparate geographic distribution [11]. The southeast of China is not a high incidence area, but it has an increasing trend.

Less than 14% of oesophageal cancer patients survive longer than five years, despite advances in the fields of oncology and surgery [12]. This is partly because of the biology of the disease and partly because of the delay in diagnosis of the cancer in the majority of patients [13]. Like many other cancers, early diagnosis may mean early treatment, thus giving a better prognosis [14]. In addition, gender, age, histopathological stage, tumour length and location, number of metastatic lymph nodes(LNs), etc. are proposed as independent prognostic indicators [15–20].

The objective of this analysis is to review the demographic and histopathological features in southeastern China with the hope of providing clues for early diagnosis.

Material and methods

Patients

The data was obtained from the biobank of the National Engineering Centre for Biochip at Shanghai. The biobank is approved by the National Development and Reform Commission of the Chinese government, which cooperates with a number of hospitals and research institutions in southeastern China. All the patients included were pathologically confirmed as ESCC. The local ethics committee approved the procedure.

Assessment of demographic and histopathological features

The following data was obtained: age, gender, clinical manifestation, histopathological stage, tumour location, tumour length, and metastatic and dissected LNs. The tumoural and nodal status was determined according to the American Joint Committee on Cancer (AJCC) tumour-node-metastasis (TNM) staging system (7th edition) [21].

Table 1. Tumour characteristics

Demographics		*n* (%)
Gender	male	978 (74.26)
	female	339 (25.74)
	total	1317 (100)
Age (years)	media ± SD	61.42 ±9.60
	range	5–92
Symptom	dysphagia	1230 (93.40)
	chest pain	101 (7.67)
	bleeding	12 (0.92)
	epigastric pain	10 (0.77)
	reflux	82 (6.25)
	hiccups	20 (1.58)
	odynophagia	112 (8.49)
	found mass	42 (3.19)
	heartburn	32 (2.45)
	nausea	17 (1.31)
	hoarseness	8 (0.61)
	total	1317 (100)
Tumour location	upper third*	127 (9.64)
	middle third	867 (65.83)
	lower third	323 (24.53)
	total	1317 (100)
TNM stage	IA	101 (7.67)
	IB	158 (12.00)
	II	573 (43.51)
	IIIA	253 (19.21)
	IIIB	224 (17.01)
	IV	8 (0.61)
	total	1317 (100)
Tumour length(cm)	media ± SD	4.45 ±1.73 cm
	range	0.2–15 cm
	≤ 3 cm	357 (27.11)
	> 3 cm	960 (72.89)
	total	1317 (100)
No. dissected LN	media ± SD	10.70 ±6.29
	range	1–41
	< 12	856 (65.00)
	≥ 12	461 (35.00)
	total	1317 (100)
NO. metastatic LN	media ± SD	1.22 ±2.16
	range	0–28
	0	708 (53.76)
	1–3	471 (35.76)
	≥ 4	138 (10.48)
	total	1317 (100)
LNR	≤ 0.2	999 (75.85)
	> 0.2	318 (24.15)

**including both cervical and upper thoracic*

Statistical analysis

Statistical analysis was performed using SPSS software ver17 package. Frequencies were provided using descriptive statistics. Chi-square analysis was used to investigate the significant relationship among different demographic, endoscopic, and pathological features. *P*-values lower than 0.05 were considered statistically significant.

Results

The total number of ESCC recorded was 1317; the characteristics are summarized in Table 1.

Gender and age

A total of 978 males (74.26%) and 339 females (25.74%) were found, with a ratio of 2.88 : 1. Patients' ages ranged from 5 to 92 years, with a mean age of 61.42 ±9.60 years; 74.34% of cases occurred between 50 and 70 years old

Manifestations

Dysphagia was the most frequent symptom, accounting for 93.40% of all cases. Apart from dysphagia, other presenting symptoms included the following: chest pain in 101 (7.67%), bleeding in 12 (0.92%), epigastric pain in 10 (0.77%), reflux in 82 (6.25%), hiccups in 20 (1.58%), odynophagia in 112 (8.49%), heartburn in 32 (2.45%), nausea in 17 (1.31%), and hoarseness in 8 (0.61%) patients. 42 (3.19%) patients had an oesophageal mass found accidently with no symptoms; however, some patients experienced more than one symptom.

Histopathological staging

Tumour stages were as follows: stage IA, $n = 101$ (7.67%); stage IB, $n = 158$ (12.00%); stage II, $n = 573$ (43.51%); stage IIIA, $n = 253$ (19.21%); stage IIIB, $n = 224$ (17.01%); and stage IV, $n = 8$ (0.61%). χ^2 analysis demonstrated a significant difference for the histopathological stages between different sex groups ($p = 0.000$), but there was no difference between different age groups ($p = 0.973$) (Table 2). Males were more likely to present with higher tumour stage than females (Fig. 1).

Tumour length and location

The mean tumour length was 4.45 cm (range 0.2–15 cm). 72.89% of the patients had a tumour length greater than 3 cm. χ^2 analysis demonstrated a significant difference between different sex groups ($p = 0.000$), patients with a tu-

Table 2. The tumour location, length, and stage in different age and sex groups

		Stage						*P*-value	Length		*P*-value	Location			*P*-value
		IA	IB	II	IIIA	IIIB	IV		≤ 3 cm	> 3 cm		upper parts	middle parts	lower parts	
Age (years)	< 50	7	14	49	18	17	2	0.973	31	76	0.399	9	69	29	0.864
	50–70	76	119	423	189	167	5		256	723		93	651	235	
	> 70	18	25	101	46	40	1		70	161		25	147	59	
Sex	male	35	103	444	215	176	5	0.000	233	745	0.000	73	637	268	0.000
	female	66	55	129	38	48	3		124	215		54	220	65	

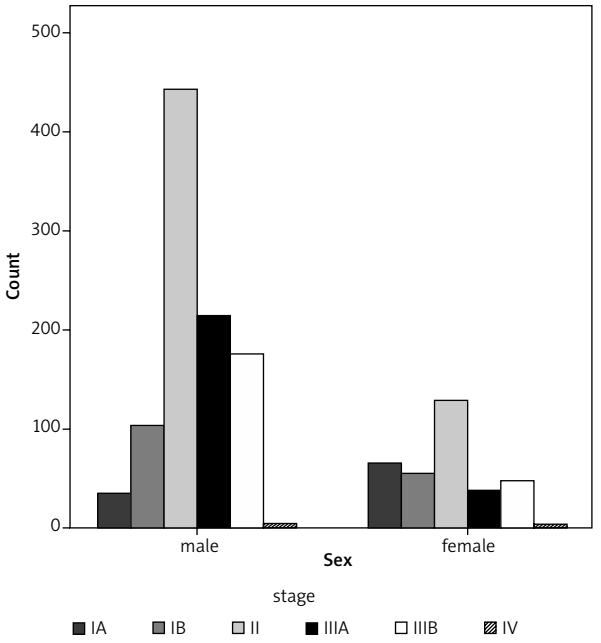

Fig. 1. Stages between different sex groups. Females were more likely to present with localised disease and were less likely to present with distant disease than males (p = 0.000)

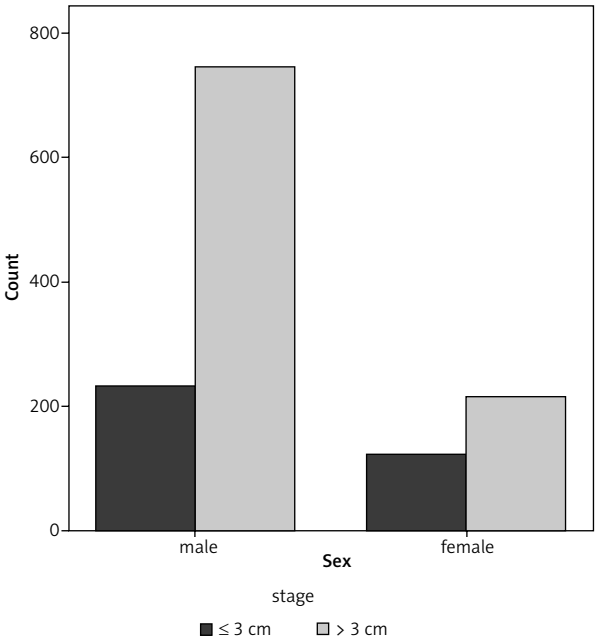

Fig. 2. Length between different sex groups. More than 70% of patients had a tumour length greater than 3 cm, and it was more common in males (p = 0.000)

mour length > 3 cm were more common in males (Fig. 2), but no difference was found between different age groups (p = 0.399) (Table 2).

The tumour was located in the upper third of the oesophagus in 127 (9.64%) patients, in the middle third in 867 (65.83%) patients, and in the lower third in 323 (24.53%) patients. According to chi-square analysis, there was a significant difference between different sex groups (p = 0.000), males were more likely to present with lower parts of the oesophagus and less likely with upper parts than females (Fig. 3). However, there was no difference between different age groups (p = 0.864; Table 2).

Metastatic and dissected lymph nodes

Of the 1317 patients enrolled, 609 were found to have regional LN metastasis, with a rate of 46.24%. A mean (SD) of 10.70 (6.29) (range 1–41) LNs were dissected from each specimen with a mean (SD) number of histopathological positive LNs of 1.22 (2.16). 461 patients (35.00%) had more than 12 LNs dissected; this cutoff point was employed because it was recommended that at least 12 LNs be removed in the 7th TNM classification [21].

The LN ratio (LNR) measures the number of involved regional LNs compared to the number of dissected LNs. There were 999 patients (75.85%) with LNR ≤ 0.2. A 0.2 ratio of LNR was chosen according to previously published studies, taking into account the more frequent cutoff value identified [22, 23].

Discussion

ESCC is a common malignancy in China. Although there are increasing studies about ESCC in China, a long delay still exists in diagnosis and treatment of the disease. A few

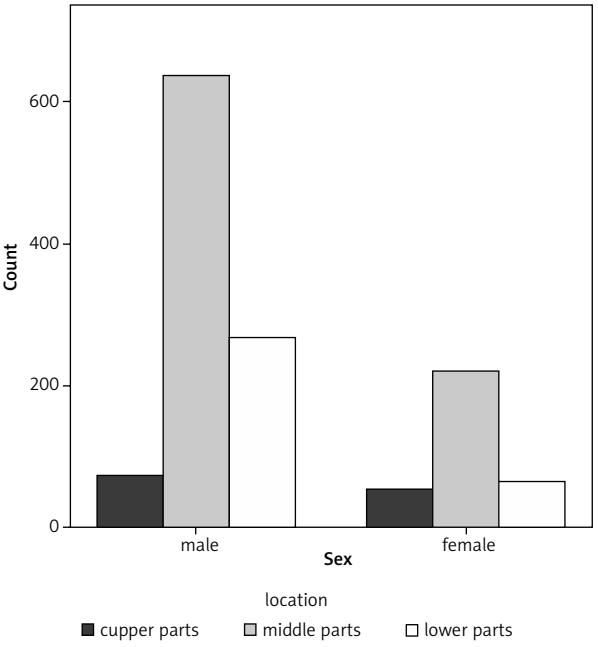

Fig. 3. Location between different sex groups. Males were more likely to present with lower parts of the oesophagus and less likely with upper parts than females (p = 0.000)

months delay in diagnosis and treatment has a significant influence on the stage of ESCC and, therefore, for the prognosis of the disease [24, 25]. Clearly, a deeper understanding of the characteristics of ESCC in China is required.

Dysphagia is the most typical and striking symptom of ESCC, yet two thirds of patients will tolerate this symptom for a few months before seeking advice [26, 27]. Wang *et al.* [24] reported that the median symptom-to-treatment de-

lay was 2.1 months in China. Subasinghe *et al*. [28] demonstrated that patient delay was the most majority part of the total. In our analysis, dysphagia was the most common symptom, which was present in over 90% of the patients, a proportion much higher than that in other studies [29]; therefore, more attention should be paid to this symptom.

The prognosis of ESCC correlates well with the stage according to the new TNM classification [21]. The predominant histopathological stages in the current analysis were II and III, comprising 79.73% of all ESCCs. Females were more likely to present with localised disease than males, which could be due to the fact that females were more likely to seek medical attention [16].

On the other hand, it should be emphasised that the TNM system is only as helpful as its accuracy [30]. To get an accurate idea about LN, it is recommended that at least 12 LNs should be removed [21]; however, only 35% of patients were eligible in our analysis, which may have affected the staging results.

The tumour length of ESCC was once regarded as a prognostic factor, but it was removed from the staging system in 1987 [31]. However, some recent publications suggest that oesophageal tumour length is an important prognostic factor for survival once again; the longer the tumour, the worse the prognosis. The length of 3 cm was considered as the cutoff point for prediction [32]. In our analysis, it is important to note that more than 70% of patients had a tumor length greater than 3 cm, and more common in males.

The strength of this analysis is that we carried out comprehensive research on the characteristics of ESCC in southeastern China, which will contribute to early diagnosis and future further study.

In conclusion, dysphagia was more common in ESCC patients in southeastern China, and males had a higher incidence, with longer and more distant disease, which gives a poor prognosis.

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The authors declare no conflict of interest.

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