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Abstract

**Objectives:** To analyze esophageal cancer incidence and pathological data of Zhongshan in China in 1970-2007, and to provide scientific information for its prevention and control. **Methods:** From Zhongshan Cancer Registry esophageal cancer incident and pathological data were obtained. Pathological proportions and trends were calculated and analyzed. **Results:** Although there was a continuously and obviously increasing trend for male incidence rates in 1970-2007 in Zhongshan, squamous cell carcinoma (SCC) and adenocarcinoma (AD) incident proportions during 1990-2007 remained relatively stable. Moreover, SCC was the major pathological type, accounting for 70.6 percent of all new cases, while AD were relatively few and accounted for only 2.66 percent throughout the period. **Conclusion:** The male esophageal cancer incident pattern in Zhongshan in 1970-2007 was quite different from most other domestic areas. The data suggest that etiological analysis should be enhanced for improved control in Zhongshan.

**Keywords:** Esophageal cancer - incidence - pathology - trends - Zhongshan, China

Introduction

Recently esophageal cancer epidemiology had changed remarkably, its incidence and mortality had decreased globally, while its AD incidence had increased rapidly and SCC incidence descended or kept stable in some countries (such as in USA and some European countries) or populations (such as American non-Hispanic whites and Hispanic Americans), AD had even become its major pathological type (DeMeester, 2006; CANCERMondial, 2008; Jemal et al., 2008). Its incidence and mortality in China had also declined (Sheng et al., 1998; Wang et al., 2002; Chinese National Office for Cancer Prevention and Control et al., 2008, 2009, 2010; Bill et al., 2011; Wei et al., 2011), but until now there were still no any reports on its population-based incident pathological proportions and their trends, not to mention reports on its different pathological type incident rates and trends (Fang et al., 2008). Moreover, its male incidence rates in Zhongshan had risen remarkably in 1970-1999 (Wei et al., 2003), which was not the situation in most other domestic regions. Hence, for providing information for its prevention and control in China, and also for ascertaining if its male incidence rates in Zhongshan kept rising or not, its incidence in 1970-2007 and pathological proportions in 1990-2007 in Zhongshan were analyzed.

Materials and Methods

**Sources of incident data**

Esophageal cancer incidence data came from Zhongshan Cancer Registry. Since 1970, Zhongshan Cancer Registry has been recording, collating, storing and notifying all cancer incidence and mortality data of Zhongshan registered residents. The registration was done through a three level network, which was called Zhongshan Three Ranks Cancer Prevention and Control Network, covered all the corners of Zhongshan, lead by Zhongshan Cancer Research Institute, and composed by municipal hospitals, township health centers and community health service stations. The collected data were collated by experienced registrars and was of good quality and high credibility.

**Source of population data**

in Zhongshan, when national population census were
done. 1982 Chinese standard population and 1985
world standard population were used respectively when
China and World age-standardized incidence rates were
calculated.

Statistical indices and methods
Excel software was used to set up database and to do
statistical analysis. Statistical indices included incident
numbers, crude rates, age-specific rates, China and
world age-standardized rates, pathological proportions
and trends, increasing rate, average developing velocity,
average increasing rate and APC. The statistical methods
used here were the methods recommend by the Guideline
for Chinese Cancer Registration (Chinese National Office
for Cancer Prevention and Control et al., 2003).

Results
Incident general situation
There were 2,494 new esophageal cancer cases in
Zhongshan in 1970-2007, 2,154 of them were male and
340 female. Its incident number sex ratio was 6.34:1.
Its male incidence crude rate, China and world age-
standardized rates were 9.90/105, 9.44/105 and 12.44/105
respectively, female 1.57/105, 1.28/105 and 1.71/105
respectively, both gender 5.74/105, 5.18/105 and 6.82/105
respectively. Its youngest and oldest patients were 17 and
93 years old respectively, and its median and average
incident age were 60 and 59.48 respectively.

Some 75.42 percent of new esophageal cancer cases
with pathological diagnosis, and 24.54 percent with
imaging diagnosis such as CT scan in Zhongshan in
1970-2007, while its pathological diagnosing proportions
before 1990 in Zhongshan were very low, only 1.82 percent.
After 1985, its pathological diagnosing proportions had increased
gradually, more than 40 percent in 1985-1989, over 80
percent in 1990-1994, and more than 90 percent after

Incidence trend
There were obviously and continuously ascending
trends for its male and both gender world age-standardized
incidence rates (Figure 1). Its male incident increasing rate,
average developing velocity, average increasing rate and APC value were 2290.43 percent, 112.47 percent, 12.47
percent and 6.70 (P=0.0000) respectively, and both gender
were 2808.84 percent, 113.30 percent, 13.30 percent and
5.46 (P=0.0000) respectively in Zhongshan in 1970-2007.

Incident Proportions of its different pathological types
As its pathological diagnosing proportions before
1990 in zhongshan were very low (less than 50 percent),
it was hard to make comparison among the proportions
of its different pathological types. It was until 1990 that
comparison was possible. In Zhongshan in 1990-2007
there were total 1,956 new esophageal cancer cases
(1,744 male, 212 female), 1,496 of them (1,341 male,
155 female) with explicit pathological diagnosis which
accounted for 76.48 percent of all its new cases (76.98%
male, 73.11% female), 1,380 of them (1,246 male, 134
female, sex ratio=9.30 ) with SCC which accounted for
70.55 percent of all its new cases (71.53% male, 63.21%
female), 52 of them (47 male, 11 female, sex ratio=3.73)
with AD which accounted for 3.27 percent of all its new
cases (3.10% male, 4.72% female). SCC was its major pathological type in Zhongshan in
1990-2007 (Figure 1).

Incident Trend of its different pathological types
The proportions of its new cases with explicit
pathological diagnosis and SCC increased rapidly in
1990-1994, the former ascended from 50 percent in 1990
to 80 percent in 1994, the latter up from 30 percent in
1990 to 75 percent in 1994, after 1994, both remained
relatively stable. While the proportions with AD and other
pathological types were lower and stable all along (Figure
2). Its SCC incident proportions increased in 1990-1994,
but stable thereafter no matter male or female (Figure 3). Its male AD incident proportions were relatively stable, but female fluctuated more in Zhongshan in 1990-2007 (Figure 4).

Discussion

In 1985-1989 esophageal cancer pathological diagnosing proportion was less than 45 percent, but in 1990-1994 more than 80 percent in Zhongshan. Its causes may be that gastroscope was not used in major Zhongshan hospitals until 1990. Considering its pathological diagnosing proportions in Chinese selected urban and rural areas in 2005-2006 were lower than that of Zhongshan in 1970-2007 and much lower than that of Zhongshan in 2005-2006 (Chinese National Office for Cancer Prevention and Control et al., 2009, 2010), we can safely say that esophageal cancer incidence data in Zhongshan in 1970-2007 was of good quality and high credibility.

Its male incidence rates in Zhongshan had increased conspicuously and continuously in 1970-2007, but much lower and stable for female. This was consistent with the previous report by Wei et al. (2003) and the increasing trends of some countries such as male Netherlands, the Great Britain, Denmark, Japan and female Denmark, Norway, France and Holland (IARC, 2008), and few domestic regions such as Jinshan districts of Shanghai City (Gan et al., 2007) and Wuwei city of Ganshu province (Luo et al., 2002), but not with the global trends and the decreasing or stable trends of most domestic areas had increased or not, as their research was not based on population data. Our research was based on population data, so could demonstrate if its SCC or AD incidence had increased or not in Zhongshan. We found that although there was an obviously and continuously increasing trend for its male incidence, its SCC and AD proportions kept relatively stable, and SCC was its major pathological type in Zhongshan in 1990-2007 all along. This was not the situation abroad especially in USA and European countries. It indicated that its male etiology in Zhongshan maybe different from that of USA and European countries. We did not use incidence rate to analyze its different pathological type trends, it was because 25 percent of its new cases, who were Beijing natives and treated by surgery in Beijing Tongren hospital, increased in 1982-2005, while AD new cases, who were Cixian natives and operated in Cixian People’s Hospital of Hebei province and Beijing Tongren hospital respectively, increased too. The report by Fan YJ et al was hard to show if esophageal SCC and AD incidence in urban areas and AD incidence in rural areas had increased or not, as their research was not based on population data. Our research was based on population data, so could demonstrate if its SCC or AD incidence had increased or not in Zhongshan. We found that although there was an obviously and continuously increasing trend for its male incidence, its SCC and AD proportions kept relatively stable, and SCC was its major pathological type in Zhongshan in 1990-2007 all along. This was not the situation abroad especially in USA and European countries. It indicated that its male etiology in Zhongshan maybe different from that of USA and European countries. We did not use incidence rate to analyze its different pathological type trends, it was because 25 percent of its new cases in Zhongshan in 1990-2007 had no explicit pathological types. If incidence rate was used its incidence rates would be much lower than the actual rates.

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References


