Incidence of cancer esophagus in Quetta and Karachi, Pakistan

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Objective: To study the differences in the incidence of cancer esophagus in Karachi and Quetta, Pakistan.

Methods: Incident cases of cancer esophagus registered from January 1, 1995 to December 31, 2000 were included for Karachi South, and those registered from January 1, 1998 to December 31, 2000 were included for Karachi Division and Quetta. Results: In Quetta, cancer esophagus had age-standardized incidence rate (ASIR) of 25.5/100,000 population in males and 23.4/100,000 population in females, and it was the commonest malignancy in both genders. In comparison, in Karachi South and Karachi Division, cancer esophagus ranked 7th among cancers in males (ASIR 6.2/100,000 and 5.0/100,000 population, respectively) and 5th in females (7.0/100,000 and 4.9/100,000 population, respectively). The ASIR was similar among males and females in all data sets. Conclusion: The incidence of cancer esophagus in Quetta is comparable to that in high-incidence regions, whereas the incidence in Karachi is similar to that in moderate-incidence zones. In contrast to other world regions, cancer esophagus was equally common in males and females in Pakistan. The high risk in Quetta warrants investigation for risk factors and a targeted cancer control program. [Indian J Gastroenterol. 2003;22:170-172]

Key words: Carcinoma esophagus

Cancer esophagus is the eighth most common cancer worldwide. Its incidence in various parts of the world varies 40-fold, and it is mainly a tumor of developing countries. In most regions, males are at a greater risk. There are two geographical 'high-risk belts'; the Asian belt comprising Central Asia, China, Kashmir and Iran, and the African belt comprising eastern and southern African countries, viz., Kenya, Malawi and Botswana-Lesotho. In parts of South America, the Caribbean, Western Europe and parts of the Indian subcontinent too, males are at moderately high risk.

This geographical distribution may be partly related to distribution of major risk factors, namely, dietary or nutritional factors, smoking, alcohol and exposure to nitrosamines. Thermal irritation associated with salted hot beverages and some disease conditions have also been implicated as strong risk factors.

This paper reports cancer data from two cities of Pakistan, Karachi and Quetta. The city of Karachi (Karachi Division; KD) has a population of 9,802,134 (including 5,261,712 males). This city has a large Mohajir population; this is a mixed community that migrated from India at the time of partition of the subcontinent and has largely retained their pre-migration cultural and social heritage. Karachi South (KS), the southernmost district of the city, is a subset of KD and has a population of 1,724,915 (929,394 males). It includes all ethnic groups, namely, Sindhis, Punjabis, Pathans, Baluchs and Mohajirs, with a fair representation of all socio-economic categories. Quetta has a population of 759,245 (425,474 males), and the majority of its residents are Persian or Baluchi-speaking Baluchs or Pashtuns.

Methods

Incident cases of cancer esophagus registered at the Karachi Cancer Registry during January 1, 1995 to December 31, 2002 were analyzed. For maximum completion of data, cases registered from January 1, 1995 to December 31, 2000 were included for KS and those registered from January 1, 1998 to December 31, 2000 were included for KD and Quetta. People residing in the specified geographical regions for more than six months were considered residents, as per the International Agency for Research on Cancer (IARC) minimal residence criterion. Variables recorded for analysis were the date of detection, age, sex and ethnicity of the patient, and topography, morphology, grading and staging of the tumor.

The data were classified using ICD-O2 (International Classification of Diseases-Oncology, 2nd edition) and computerized using a customized version of CanReg3 software (IARC, WHO). Validity checks for cancer data were performed as per the recommendations of the IARC and International Association of Cancer Registries (IACR).

The person-years of population at risk by gender
and 5-year age groups were estimated based on the 1998 census, assuming annual population growth rate of 1.94% for KS, 3.52% for KD and 4.01% for Quetta. This growth rate was based on the inter-census growth rate calculated by the Federal Bureau of Statistics. Age-standardized incidence rates (ASIR) were calculated using an external reference ‘world’ population; the methodology applied was direct standardization, using 5-year age groups. The rates were expressed as annual incidence per 100,000 population, averaged over the number of years for which data were analyzed.

**Results**

There was a high incidence of cancer esophagus in Quetta, where the malignancy was the commonest cancer in males (ASIR 25.3/100,000 population) and females (23.4/100,000). A lower incidence was found in Karachi in both sets (KD and KS) of registry data analyzed. In this city, cancer esophagus ranked 7th among all cancers among males (KD 5.0/100,000 population; KS 6.2/100,000 population) and 5th among females (4.9/100,000 and 7.0/100,000 population, respectively). Lung, oral cavity, larynx, urinary bladder, lymphoma and pharynx preceded esophagus in ranking in males, whereas breast, oral cavity, ovary and cervix preceded esophagus in females.

The male: female ratio was approximately 1 for data in all three regions. The mean age of patients was 54.3 years (95% CI 53.4-55.2) in KD, 54.2 years (52.7-55.7) in KS, and 53.3 years (51.7-54.9) in Quetta.

Approximately 90% of patients in KS and KD were histologically confirmed, the rest being confirmed radiologically (magnetic resonance imaging and computed tomography); in Quetta, histological confirmation was available in 98% of patients. In all locations, the majority of cases presented in stage III (53.9%, 62.9% and 56.6% in KD and KS, and Quetta, respectively).

At histology, 81.1%, 86.6% and 79.5% of the malignancies were squamous cell carcinoma in KD, KS and Quetta, respectively; 3.6%, 7.0%, and 15.9%, respectively were adenocarcinoma. The location of the tumor was known in approximately 50% of cases; of these, 60% involved the lower esophagus in KD and KS, and

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<tr>
<th>Table: Distribution of cases according to morphology</th>
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<tr>
<td>Number of cases</td>
</tr>
<tr>
<td>Squamous cell carcinoma (%)</td>
</tr>
<tr>
<td>Adenocarcinoma (%)</td>
</tr>
<tr>
<td>Other specified carcinomas (%)</td>
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<tr>
<td>Unspecified carcinomas (%)</td>
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<tr>
<td>Sarcoma (%)</td>
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<tr>
<td>Other unspecified morphology (%)</td>
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65% involved the upper or mid esophagus in Quetta.

Figures 1 and 2 show the age-specific incidence rates for cancer esophagus in the three populations. This showed a gradual rise to a maximum in the 7th decade followed by a flattening or apparent decrease in the risk, in the Karachi regions and in Quetta females. This change was not observed in Quetta males, due probably to an actual increased risk with age.

**Discussion**

Squamous cell carcinoma was the most common morphological type of esophageal cancer in all the three data sets, the frequency being higher than the global IARC figures (Table). In some of the high-incidence zones in Asia for cancer esophagus with predominant squamous cell morphology (Iran, Kashmir and Pakistan), alcohol consumption is not a prevalent habit and therefore not a major risk factor. This may partly explain the equal risk in both genders. Other factors cited above come forth as major risk factors. The male: female ratio is one in high-risk countries and is high in low-risk countries, indicating interplay of risk factors active in both genders.

The incidence in Karachi was identical to that in low- and medium-incidence regions, e.g., most geographical zones of India. This suggests that cultural and lifestyle characteristics retained by the migrant Mohajirs may contribute to the disease. Risk factors identified in Indian studies include bid and cigarette smoking, and paan and tobacco chewing. Alcohol has been mentioned as a major risk factor in India, but is not a factor in Karachi.
Paan chewing is not prevalent in Quetta. However, the practice of drinking hot salted tea (kahwa) and exposure to dietary amines and nitrates appear to be risk factors. Studies from Kashmir support this view. The staple diet of residents is meat cooked in animal fat, dried salt-pickled meat, or meat cooked over charcoal. The oral or nasal use of tobacco (naswar) and the consumption of opium residues may be additional risk factors.

In conclusion, the incidence of cancer esophagus in Quetta is comparable to that in high-incidence regions, whereas that in Karachi is similar to that in moderate-incidence zones. In contrast to other world regions, cancer esophagus in Pakistan is equally common in men and women, probably reflecting the pattern of exposure to known risk factors such as paan, areca nut and tobacco chewing, tobacco smoking, naswar, pickled or smoked meat, and diet deficiencies. The high incidence in Quetta warrants investigation of risk factors and a targeted cancer control program.

References

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