Guest editorial*

Esophageal cancer in Kashmir – an assessment

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Introduction

Epidemiological data show a wide variation in the geographical distribution of human cancers and, therefore, suggest an important contribution of the local environment in influencing the incidence of the disease (Doll 1978). Several studies in recent years have implicated dietary habits and life-style in increasing the risk of certain cancers in different parts of the world (Joint Iran-IARC Study Group 1977, Yang 1980; Day and Munoz 1982). It is now believed that a majority of human cancers are of environmental origin (Doll 1977; Higinson and Muir 1979), and thus in principle can be prevented to a considerable extent, provided the specific risk factors are identified and proper intervention measures are introduced.

Among the cancers which are considered to be etiologically linked to the human environment, esophageal cancer presents the most unusual epidemiology (Tuyns et al. 1985). First, high incidences of esophageal cancer are found in populations having diverse life-styles with differing environmental conditions, and secondly, a sharp decline is observed in the incidence of this disease in neighbouring areas (Dowlatsahi and Moharban 1984). These contrasting epidemiological features indicate that the causal and contributing factors that may be necessary for the disease are intrinsic to the milieu of susceptible populations. While the presence of an unknown common causal agent can not be ruled out, different predisposing and promoting factors could be involved in high-risk areas of esophageal cancer in different regions.

High occurrences of esophageal cancer have been observed in the Linxian province in China (Yang 1980), the Caspian Littoral of Iran (Mahboobi et al. 1973), the Transkei region in South Africa (Burrell 1962), and Brittany in France (Tuyns and Masse 1973). Low to moderate incidences of this cancer have also been reported from several other regions (Dowlatsahi and Moharban 1984). In recent years intensive epidemiological as well as analytical studies have been conducted in some of these areas (Coordinating Group for Research on Etiology of Esophageal Cancer in North China 1975; Joint Iran-IARC Study Group 1977). Despite little success in identifying specific etiological risk factors, such studies have certainly strengthened the view that food habits and other practices of life-style are closely associated with the disease (Lu and Lin 1982; Preussmann 1987; Pera et al. 1987). Thus, the consumption of alcohol (Tuyns et al. 1979), hot beverages (Day and Munoz 1982; Ghadirian 1987), tobacco (Martinez 1969) and the use of mouldy foodstuffs (Li et al. 1980) have been suggested as major risk factors for esophageal cancer in different places. Furthermore, lack of animal proteins (Hormozdari et al. 1975; Tuyns et al. 1985), fresh fruits and vegetables (Cook-Muzaffari et al. 1979) and deficiency of zinc (Fong et al. 1977) and vitamin B1 (Van Rensburg 1981; Thurnham et al. 1985) have also been considered as vital contributing factors for a high occurrence of the disease. While some of these factors may be primarily involved in inducing a favourable predisposition to the disease, others may act as sources of causative or promotional agents necessary for initiation and development of the organ-specific malignancy.

We report here our preliminary assessment of a high-risk area for esophageal cancer in Kashmir (India). Some of the unique environment features that may have strong bearing on the incidence of esophageal cancer in the region are discussed.

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The geography and population

Kashmir is a valley at high altitude in the Jammu and Kashmir province of India, situated in the extreme north of the Indian subcontinent. There are three geographically different regions in the province inhabited by populations with diverse sociocultural backgrounds and life-styles.

The Jammu region is located at an altitude of 300–3000 m having a warm tropical climate. It has a population of 2.9 million, of which nearly 95% people are Hindus. Kashmir is situated at 1800-4000 m above sea level on the northern borders of Jammu and has a population of 3.1 million, of which nearly 95% are Muslims. It has a temperate climate with a severe winter and a moderate summer. The Ladakh region is situated further north at an altitude of 3000-6000 m and has a predominantly Buddhist population among its 130000 inhabitants. Thus, the three geographical segments of Jammu and Kashmir province are inhabited by people of differing socioreligious backgrounds and life-styles, a feature which could be advantageous in studying environmentally related disease patterns.

Evidence for esophageal cancer

In the past two decades, improved diagnostic and medical facilities in this area have been responsible for emergence of information concerning an apparently high rate of esophageal cancer among the Kashmiri population. The region has no cancer registry and the hospital statistics are largely unclassified. We have, therefore, based our assessment primarily on published and unpublished hospital data available from medical professionals working in the area.

It has been reported that esophageal cancer accounted for 21.5% of the patients diagnosed histopathologically for various malignancies at the Government Medical College Hospital, Srinagar (Kashmir), during 1962–1970 (Mattoo and Kaul 1974). In a retrospective study of cancer patients attending the same hospital for radiological investigations between July 1980 and December 1982, 494 cases of esophageal cancer were observed out of a total of 1076 diagnosed cases of different malignancies (B. Sanyal, personal communication). In a 5-year study on 480 diagnosed cases of esophageal cancer patients aged between 21 and 76 years, Maqbool and Ahad (1976) report a male:female ratio of 2:1. Dietary habits of these patients showed that 70%–80% of them used excessive amounts of red chillies and spices in their food and consumed about 15–20 cups of hot salted tea per day. Prevalence of esophagitis has also been observed in the normal population of Kashmir (A. G. S. Pathania, personal communication). In addition, a high rate of gastric cancer has also been reported in Kashmir (Durrani 1982).

Considering the low to moderate rates of occurrence of esophageal cancer in various regions of India (Table 1), the Kashmiri data appear to be remarkably high, therefore emphasising the need for a planned epidemiological study to determine the incidence rates of the disease in this region.

Absence of known risk factors for esophageal cancer

The consumption of alcohol and smoking of tobacco have been shown to be major risk factors in Europe and the United States (Tuyns et al. 1985), whereas chewing of tobacco, use of betel-nut, opium and special dietary habits have been related to the high occurrence of this disease in Asia and Africa (Dowlatshahi and Mobarhan 1984). Deficiency of Zn and vitamin B1 as well as a lack of intake of fresh fruits, vegetables and animal proteins have also been linked with increased risk of esophageal cancer in developing countries (Hormozdiari et al. 1975; Cook-Muzaffari et al. 1979).

In Kashmir, however, the situation appears to differ with respect to some of these risks related to lifestyle. The population is almost entirely non-vegetarian with sufficient intake of lamb meat and fish. The area is devoid of alcohol consumption since the people are predominantly Muslims. Although the use of water pipes (‘hukka’) has been quite common in rural areas, cigarette smoking is only now becoming popular in the towns; chewing of tobacco or betel-nut is practically unknown to the local inhabitants. Moreover, Kashmir being one of the highest fruit-producing regions in the country, the local inhabitants in general have an adequate intake of locally grown fruits. Thus, the consumption of alcohol, the use of chewing tobacco or betel-nut, lack of animal proteins

<table>
<thead>
<tr>
<th>Place</th>
<th>All sites</th>
<th>Esophagus</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangalore a</td>
<td>2137</td>
<td>131</td>
<td>6.1</td>
</tr>
<tr>
<td>Madras a</td>
<td>2297</td>
<td>115</td>
<td>5.0</td>
</tr>
<tr>
<td>Chandigarh a</td>
<td>2455</td>
<td>139</td>
<td>5.6</td>
</tr>
<tr>
<td>Dibrugarh a</td>
<td>1226</td>
<td>108</td>
<td>13.3</td>
</tr>
<tr>
<td>Trivandrum a</td>
<td>3493</td>
<td>134</td>
<td>3.8</td>
</tr>
<tr>
<td>Ahmedabad a</td>
<td>7740</td>
<td>582</td>
<td>7.5</td>
</tr>
<tr>
<td>Bombay b</td>
<td>18690</td>
<td>1660</td>
<td>8.8</td>
</tr>
<tr>
<td>Kashmir</td>
<td>1413 c</td>
<td>304</td>
<td>21.5</td>
</tr>
<tr>
<td></td>
<td>2808 d</td>
<td>826</td>
<td>29.4</td>
</tr>
</tbody>
</table>

a Data for 1982 (Perkin 1986)
b Data for 1978–1982 (Waterhouse et al. 1982)
c Data for 1962-1971 (Mattoo and Kaul 1974)