

CARCINOMA OESOPHAGUS

Pages with reference to book, From 31 To 32

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Like any other malignancy, the aetiology of oesophageal carcinoma is complex and multifactorial. Worldwide there is a striking geographic and ethnic variability. Epidemiological studies show an incidence as low as less than 45/100,000 in the western affluent population¹, to as high as over 100/100,000 population in areas such as Kazakhstan Province of U.S.S.R., Gonbad region of Northern Iran, Hunan Province in China and Southern Transkei district of South Africa². These regional clustering of cases suggest a causal role for both host and environmental factors, which increase the individual's susceptibility. No single environmental factor is responsible for the development of oesophageal carcinoma⁴; however, environmental carcinogens nutritional deficiencies, chronic irritation and mucosal damage have been incriminated so far. Excessive alcohol ingestion has been found as a major risk factor for developing oesophageal cancer in United States and France^{3,4}. Aromatic hydrocarbons and carcinogenic contaminants offermentation process were detected in different types of alcohol, while nitrosamines, aflatoxin, tannins were also found in home made beer in hyperendemic areas of Africa^{5,6}. In European countries, India and South Africa, where cigarette smoking is common, tobacco was thought to be the carcinogenic factor. Tobacco whether smoked, chewed or snuffed is associated with several respiratory, oral and gastrointestinal tumours⁷. An article published in this issue of the journal⁸ also shows a high frequency of tobacco smoking and chewing in the form of pan and niswar in Pakistani patients as compared to controls, suggesting that this could be one of the carcinogenic factors in our population. None of the patients in this study were alcohol or opium users. A case report from Karachi incriminates betel nut for this malignancy⁹. Oesophageal cancer is one of the commonest causes of death in adults in northeast Iran, which has highest incidence of oesophageal carcinoma¹⁰. Although the cause of this unusually high incidence is not known but alcohol and tobacco smoking were not found to be the causative agents¹¹. The diet in this high incidence area comprises of bread, sheep's milk and tea with a very low consumption of vegetables, fruits and meat, while diet in low incidence areas of Iran is mainly rice, vegetables, fruits and tea^{11,12}, suggesting some nutritional deficiency in the high incidence areas. Earlier studies have demonstrated that nutritional deficiency leads to a premalignant atrophic lesion usually found in association with oesophageal cancer, mucosal ulceration and inflammation⁶. Association of oesophageal lesions and carcinoma due to iron deficiency anemia is so far best understood¹³. However, some other nutritional deficiencies like riboflavin, vitamin A and C have also been documented in hyperendemic areas^{11,14,15}. In high prevalence areas of Iran and China chronic oesophagitis involving mainly the middle and lower third of the oesophagus was found in 80% and 84% of population, respectively^{16,17}. It was associated with atrophic changes in 10% and dysplasia in 8% of the cases¹⁷. Although the exact cause is not known but it has been suggested that deficiency of riboflavin, vitamin A and zinc, thermal injury resulting from drinking very hot beverages and physical injury caused by ingestion of coarse food and opium tar may be the possible aetiological factors for these precursor lesions¹⁷, which later lead to the development of carcinoma. Mineral element deficiency also facilitates the fungal invasion in the tissue leading to dysplastic changes¹⁸. Other environmental factors could be the high levels of nitrosamines found in the fruit of solanaceous bush used to curdle milk in Transkei and high incidence areas of China¹⁹⁻²¹. Ingredients used to make 'herbal tea', African bush tea, Japanese tea gruel and most of the folk remedies used in the hyperendemic areas are rich in carcinogens like diterpene phorbol esters and tanin which might be

responsible for a high frequency of carcinoma in those areas^{6,22,23}. Silica particles may also be a contaminant responsible in northern China, where 20% by weight of silica was found in millet bran, discovered in the oesophageal mucosa surrounding the tumours²⁴. Silica fibre of similar size originating from other plant species were also found in two other highest incidence areas of Transkei and Iran^{25,26}. Recently water contamination with petroleum and high levels of calcium, magnesium, chromium, iron, cadmium and cobalt have been found in Qasim region of Saudi Arabia - a high incidence area for 'carcinoma oesophagus'²⁷. In a recent survey all water samples had more than permissible (15 mg/L) level of magnesium and 3 of 18 samples had high levels of calcium in Karachi²⁸. Potential to develop into carcinoma varies with the disease, it is 7-20% in achalasia, 5% in corrosive ingestion and upto 20% in barrett's oesophagus^{29,30}. Repeated irritation to the oesophageal mucosa due to gastrooesophageal reflux, bougienage or pneumatic dilatation or short myotomy without antireflux surgery, are the known causes. Individual factors like tylosis have potentials to develop oesophageal cancer in upto 95% of cases at the age of 65, found more frequently in Turkmenistan and the Hunan province of China^{31,32}. It has also been found in association with pharyngoesophageal diverticulae³³, diaphragmatic hernia³⁴ and nontropical sprue³², although the cause of this association is unexplained. Infective aetiology has been put forward recently for the development of gastric cancer by helicobacter pylori³⁶ but its role in the pathogenesis of oesophageal carcinoma is not yet defined.

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