

Cancer in India – An Overview

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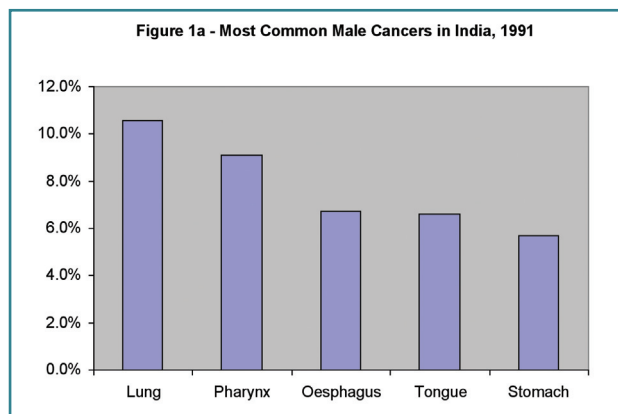
Summary

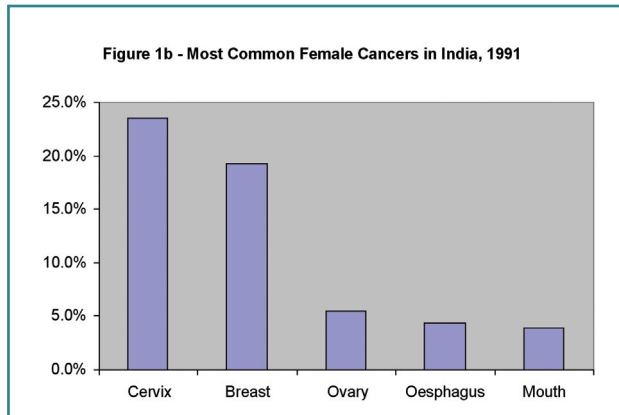
Non-communicable diseases including cancer are already emerging as major public health problems in India. These diseases are lifestyle related, have a long latent period and need specialised infrastructure and human resource for treatment. The risk factors of the major non-communicable diseases (diabetes mellitus, cardiovascular diseases and many types of cancer) are tobacco, dietary habits, inadequate physical activity and alcohol consumption. With the control of infectious diseases and increased longevity of the growing population in a country like India, the spectrum of disease changes and the burden of cancer are on the increase.

癌等の非伝染性疾患は、インドで主要な保健問題として既に浮上しつつある。これらの疾患は生活習慣に関連しており、潜伏期間が長く、治療には専門の基幹設備とスタッフが必要とされる。主な非伝染性疾患(糖尿病、心循環器疾患、多種類の癌)のリスク要因は、喫煙、食習慣、運動不足、アルコール摂取である。インドのような国において、伝染病対策が軌道に乗った今、人口が増加を続け、その平均寿命も長くなっているため、疾患分布に変化が生じており、癌の割合が増加している。

Globally the burden of new cancer cases in 2000 was estimated to be around 10 million with more than half of these cases originating from the developing world population. Although estimates vary it is estimated that by the year 2020 there will be almost 20 million new cases. Worryingly, it is not only in the number of new cases that will increase, the proportion of new cases from the developing world will also rise to around 70%. The magnitude of the problem of cancer in the Indian Sub-Continent in terms of sheer numbers is the most alarming. From the population census data for India in 1991, 609,000 new cancer cases were estimated to have been diagnosed in the country. This figure had increased to 806,000 by the turn of the century. The estimated age standardised rates per 100,000 were 96.4 for males and 88.2 for females. The most common cancers found in males were cancers of the lung, pharynx, oesophagus, tongue and stomach (Figure 1a) while among females cancers of the cervix, breast, ovary, oesophagus and mouth were common, Figure 1b (Indian J Cancer. 1998 Mar; 35(1): 10-8). The figures

given here are only estimates since 70% of the Indian population resides in rural areas and accurate and widespread epidemiology data is not available.





National Cancer Registry Programme

The Indian Council of Medical Research (ICMR) initiated a network of cancer registries across the country under the National Cancer Registry Programme (NCRP) in December 1981. This move followed the recognition that there was an urgent need for strengthening the existing cancer registries and organization of new cancer registries in different regions of the country.

The objectives of the programme are to:

1. Generate reliable data on the magnitude and patterns of cancer (morbidity, mortality, incidence)
2. Undertake epidemiological studies in the form of case control or cohort studies
3. Provide research base for developing appropriate strategies to aid in National Cancer Control Programme
4. Develop human resource in cancer registration and epidemiology.

Data collection commenced from 1 January 1982 in the population based cancer registries at Bangalore, Chennai and Mumbai, and in the Hospital Based Cancer Registries at Chandigarh, Dibrugarh and Thiruvananthapuram. From 1986 two more urban population based cancer registries were started in Delhi and Bhopal. For the first time a population based rural cancer registry was also started by the ICMR during the subsequent year (1987) in Barshi in the state of Maharashtra. In order to extend the assessment of cancer patient care, Hospital Based Cancer Registries were also started at Bangalore, Chennai and Mumbai in 1984. The staffs of the registries visit hospitals on a routine basis and review records in various departments including pathology, radiology, radiotherapy, inpatient wards and out-patient clinics to elicit the desired information on reported cancer cases. The hospitals include the main cancer hospitals and other general hospitals in both the government and private sector. The Hospital Based Cancer Registries provide an idea of the magnitude and patterns of patient care in the institution. This is especially significant as advanced disease is observed in three quarters of the patients attending first treatment, which leads to very poor survival rates. The importance of screening, early detection as well as palliative treatment has to be emphasized. All registries are required to register all malignant neoplasms coded as per the international

Classification of Diseases for Oncology (ICD-O) with a behaviour code /3 (WHO, 1975,76) (National Cancer Registry Programme 2001; PBCR 1990 –1996, pg 1-4).

Main Causes of Cancer

One of the major reasons for the high incidence of oral cancer is the continued use of tobacco. It is estimated that around 40% of the men and 15% of the women use tobacco on a regular basis. However, in certain areas of the country regular use increases to over 85% in men and over 65% in women (including smoking, chewing and applying). As a consequence some alarming localised incidence rates have been observed in tobacco related cancers including cancers of the oral cavity, pharynx, oesophagus, larynx, lung and urinary bladder. For example, women in Bangalore have one of the highest rates of cancer of the oesophagus in the world - around eight per 100,000. While the men in Bhopal have the highest rate of cancer of the tongue in the world - almost nine per 100,000. Table 1 gives statistics of tobacco related cancers from the Department of Biostatistics and Cancer Registry in Kidwai Memorial Institute of Oncology, Bangalore, Karnataka.

Tobacco related cancers account for about 52% of all cancers in males and 25% of all cancers in females. In other words these cancers account for more than one third of all cancers in both sexes. Lifestyle related factors are gaining importance as causative factors of cancer. Dietary practices, reproductive and sexual practices etc, accounts for 20-30% of cancers. Adequate and balanced dietary practices and changes in preservation and storage practices have prevented cancers of the stomach. Apart from the known risk factors for cervical cancers, human papilloma virus (HPV) in particular subtypes 16 & 18 has now been established as the sexually transmitted agent responsible for initiating cancer of the cervix in over 90% of cases in the developing world. Despite the long list of potential risk factors associated with the development of breast cancer barely 50% of cases are accounted for by these known factors. (Dinshaw AK. Cancer control from a developing country perspective Global cancer conference).

Types of Cancer

Lung Cancer

There are nearly 1.1 billion smokers across the world and 80 percent of them in the developing countries. India has a total of

Type of Cancer	Male (%)	Female (%)	Total (%)
Oral Cavity	12.5	13.1	12.8
Pharyngeal Cancers	17.6	2.5	9.5
Oesophagus	11.1	6.7	8.7
Larynx	4.6	0.4	2.3
Lung	6.1	1.0	3.3
Urinary Bladder	1.4	0.3	0.8
TOTAL Tobacco related cancers	53.3	24.0	37.4

Table 1: Proportion (%) of Tobacco Related Cancers seen at KMIO

240 million smokers; 194 million of these are male and 45 million are females (The Hindu Jun 01, 2003). Lung cancer is the most common cancer amongst men in India with approximately 33,000 new cases every year (Cancer Patients Aid Association). However, there is not sufficient information available in India and more epidemiological studies from India are still needed.

Patterns of lung cancer in India vary from that of the Western European / U.S.A population. In India squamous cell carcinoma is the commonest variety as compared to the adenocarcinoma in the West, and the disease tends to occur early in India (51-60 years). Almost 90% of patients coming forward with lung cancers are smokers with the male to female ratio of approximately 10:1. (Pathak AK, Bhutani S, Bal S, Guleira R, Kumar L, Sharma A, Kochuipillai V. Lung Cancer profile at a tertiary care centre in northern India. 2003. Abs. No. 2759 at ASCO). The increase of new cancer cases is being observed at the ground level. Dr Behera from Dept of Pulmonary Medicine, PGIMER, Chandigarh has stated that compared to 1973 when only about 85 lung cancer patients came to his hospital the number had now increased to 250.

Breast Cancer

Breast and cervical cancer are the two most important cancer types and account for one-third of all cases diagnosed in women of the developing world (Dinshaw AK. Cancer control from a developing country perspective Global cancer conference). The incidence of breast cancer is rising and is the most common cancer among urban women (Chopra R. India: the socio-economic & cultural considerations of breast cancer management. The Global summit consensus conference on breast cancer. June 2003, US). Presently 75,000 new cases occur in Indian women every year (Delhi Breast Unit, Apollo Clinic)

Cervical Cancer

There is an estimated annual global incidence of 500,000 cancers, India contributes 100,000 i.e. one-fifth of the world burden (Shanta V., Perspectives in Cervical Cancer prevention in India, 2003. The International Network for Cancer Treatment and Research). In 1996, breast cancer was the leading cancer in women globally, accounting for 376,000 deaths, followed by cancers of the stomach (290,000 deaths) and the colon rectum (252,000 deaths). Cervical cancer ranked fourth and accounted for 247,000 deaths in women. Twenty percent of all female deaths from cancer, in India, in 1990 were from cervical cancer, amounting to an estimated 61,000 deaths. The number of cervical cancer deaths in women in India is projected to increase to 79,000 by the year 2010. In the same year, an estimated 59,000 deaths in Indian women would be caused by breast cancer and 53,000 deaths by oral cancer (Women of South East Asia: A health Profile, Regional Publication SEARO NO. 34).

In Southern India carcinoma of the uterine cervix is the most common form of cancer in females (Shanta V., Perspectives in Cervical Cancer prevention in India, 2003. The International Network for Cancer Treatment and Research). A total of 4304 cervical cancer cases were registered during 1982-89 in the Chennai registry, India (Gajalakshmi V, Rajaraman S, Shanta V. A survival study of cancer in Chennai, India. Indian

J. Cancer. 2000 Dec; 37 (4) 158-164)

Oesophageal Cancer

Carcinoma of oesophagus has a more specific demographic and geographic distribution than any other cancer. It is predominantly a disease of older age and affects males more than females. The data strongly suggest that factors associated with low socio-economic status and specific dietary deficiencies along with increased intake of tobacco (including chewing), areca nut or pan, alcohol, hot and spicy food, increase susceptibility to this disease. In males in 1968-1972 cancer of the oesophagus was the leading cancer, followed by lung, larynx, tongue and stomach while in 1988-2002, cancer of the lung is the most predominant, followed by hypopharynx, oesophagus, prostate and tongue (Yeole BB. Trends & predictions of cancer incidence cases by site for Mumbai. Indian J Cancer. 1999 Jun-Dec; 36 (2-4): 163-178)

Stomach Cancer

The highest rates are recorded in the population of Mumbai and the lowest in the rural population of Barshi in Maharashtra state. The incidence of cancers of the oesophagus and stomach is declining in India. At the same time the incidence of cancers of the colon, pancreas, liver and gall bladder is rising, largely due to urbanization that leads to major changes in the diet and personal habits (Mohandas KM, Jagannath P. Epidemiology of digestive tract cancers in India. Projected burden in the new millennium and the need for primary prevention. Indian J Gastroenterol 2000; 19: 74-78). Consumption of large amount of red chillies, food at very high temperatures and alcohol are the main risk factors for stomach cancer in India (Cherian Varghese, Cancer prevention and control in India. National Cancer Registry Programme, pages 48-59).

Oral Cancer

Oral cancer is the most common cancer in India, Pakistan, and Sri Lanka and ranks high in several Southeast Asian countries. It is amenable to primary as well as secondary prevention. The association of these cancers with cultural practices like chewing tobacco was recognized almost a century ago. Continued work since then has identified tobacco use as the most important avoidable cause of oral cancer. (Cancer Detect Prev 1986; 9(3-4): 207-13). In India cancer registries have confirmed a high incidence of oral cancer and case control and cohort studies have established that the high incidence is due to widespread habits of tobacco chewing and smoking. (Gupta PC, Nandakumar A. Oral cancer scene in India. Oral Diseases, 1999; 5:1-2). Head and neck squamous cancer is a major concern in India. The proportion of advanced cases is significantly high and these patients have a dismal survival despite aggressive therapy. Often surgical resection and /or radiotherapy are not feasible in these patients (Two versus three drug combination in advanced head and neck squamous cancer: A single institution experience. C. D. Deshmukh, V. R. Pai, A. V. Bakshi; Tata Memorial Hospital, Mumbai, India; 2003) Head & neck cancers account for one fourth of male cancers in India (Cancer. 2000, 89(2): 437-444).

Treatment of Cancer

Many advances have taken place in the treatment of almost all specialities. In surgery, the changing concepts have taken into account the biology of cancer. Radical surgeries have yielded place to more conservative surgery, with the very important objective of quality of life, conserving function and organ without compromising the overall survival outcomes. This has been very clearly proven in the early stage cancer of the breast or tumours involving the soft tissue or bone, where amputative surgery has been replaced by less radical procedures. Radiation therapy has also made rapid advances with high technology, precision, computerisation and newer isotopes for therapy. Chemotherapy has played a very major role, with many new drugs and clinical protocols investigated in clinical trials. Another important area of progress over the last few years has been radiological imaging techniques using ultrasound, CT Scanners and more dynamic real time nuclear medicine scanning.

Today, state-of-the-art equipment is available in every department including the latest Spiral CT Scanners, Gamma Cameras, Ultrasound, Microscopes, Linear Accelerators, Simulators, Bone Marrow Transplantation facilities, ICU for critical care of patients, updated Operation Theatres, sophisticated Blood Bank facilities and laboratories. We are in a position to render high immunological, histochemical, technological level of biochemical, cytological and pathological services.

The strategies for early diagnosis, treatment management, rehabilitation, pain relief and terminal care have been established in a comprehensive and multidisciplinary approach for a total cancer care programme

Clinical trials on Cancer

From the beginning of 2002, 16 oncology clinical trials were granted approval to date. Of these two were phase I studies for chemotherapeutic agents manufactured by Indian Pharmaceutical companies. The studies were for non-small cell lung cancer, head and neck cancer and breast cancer. The year 2003 saw more clinical protocols being submitted for permission to conduct multinational, global studies with India as part of a global drug development plan. Studies that are ongoing include cancers of head & neck, Chronic Myelogenous Leukaemia, breast, ovarian, colorectal and lung.

India has become a destination of choice for multinational studies in the field of oncology due to the large patient numbers, improving regulatory processes that are being implemented, investigators who are research and academically inclined and the large number of patients.

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