

Epidemiology and scope of preventive oncology in Head and Neck Cancer

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Backdrop

- There are approximately 2 to 2.5 million cases of cancer in India at any given point of time
- There are 7,00,000 new cancer patients diagnosed every year in India.
- Commonest cancers in India are:
 - # Tobacco related cancers - around 3,00,000 cases / year
 - # Cancer of the Cervix Uteri - around 1,00,000 cases / year
 - # Breast cancer - around 80,000 cases / year.

Head & Neck Cancer

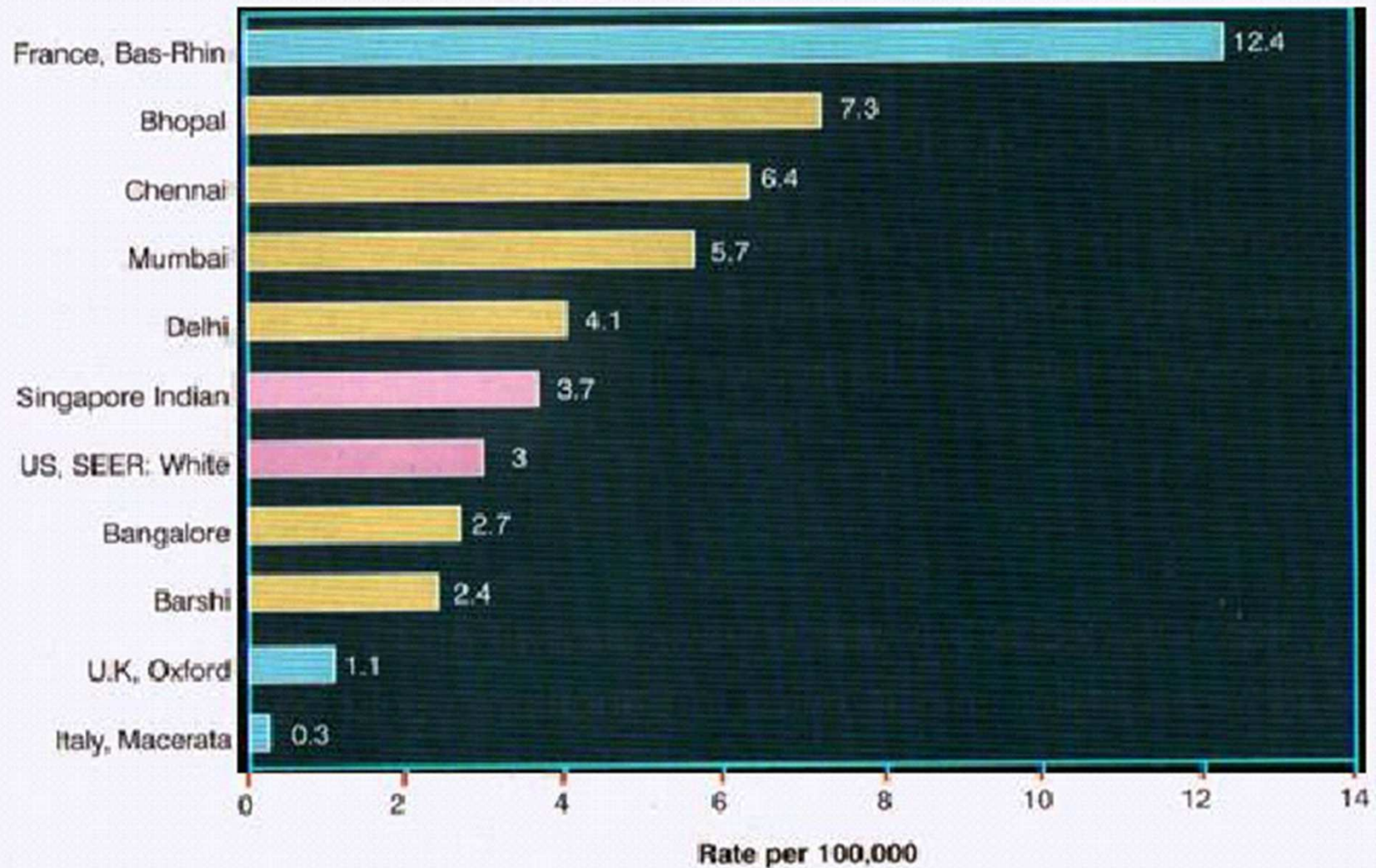
- Usually refers to neoplasms arising from below the skull base to the region of thoracic inlet
- Diverse group of diseases each with distinct epidemiologic, anatomic and pathologic features
- Wide variation in natural history, prognosis and treatment considerations
- An area of great importance to the researchers and oncologists because of the physical and psychological morbidity it produces

World scenario in Head & Neck Cancer

- Constitute 5% of all cancers worldwide
- Wide variation in incidence across the globe
- Incidence relatively low in Western Europe and the USA, although high incidence of oral cancer found in France
- Higher incidence in countries of south-east Asia, parts of Africa and South America
- In USA, incidence in black males is almost double than that of white males.

Incidence of Oral Cancer

International Comparisons - AAR



Indian Scenario

- India is one of the high incidence zones in head & neck cancer
- In India, the most common H&N cancers are those of oral cavity and pharynx
- Age adjusted incidence for these sites in Indian males range from 10.8 to 38.8 and among females, 6 to 15 per 1 lakh population
- In fact, mouth and pharynx cancers are 3rd most common cancer in males and 4th most common in females in the developing countries

Indian Scenario (...contd)

- In our hospital practice, H&N Cancers represent almost 25% of all new cases annually
- Relative proportion of individual cancer sites vary in different regions of India e.g Bhopal has the highest incidence of Tongue cancer in the world (8.8 /1 lakh), compared to Bangalore (with a rate of 3.5/ 1 lakh population)
- Laryngeal and hypopharyngeal cancers are more common in Eastern India whereas the North-eastern states (Mizoram, Arunachal Pradesh) have higher predominance of nasopharyngeal cancers

Etiologic Factors in H & N Cancer

- Age: Risk increases with age, most patients are above 50 except for salivary gland and nasopharyngeal tumours which occur in younger age groups.
- Overall male to female **ratio** is nearly 4:1
- Commonest known **etiological factor** is tobacco smoking which increases risk of developing cancer by 5-25 folds.
- Alcohol has an additive effect
- Tobacco chewing is also another high risk factor, which increases incidence of oral cancer among women

Etiologic Factors

- Local customs: ↑ incidence of hard palate cancer due to Reverse smoking of chutta in Andhrapradesh
- Pipe and cigar smokers: High incidence of lip and oral cavity cancers
- Tobacco chewing: High buccal and oropharyngeal cancer
- Low nutritional status and poor vitamin intake
- Poor oro-dental hygiene and ill fitting dentures

Etiologic Factors (...contd)

- Occupational exposure: Wood dust, textile fibre, nickel, radium etc
- Exposure to dust and chemical constituents: High incidence of cancer of nasal and paranasal sinuses
- Viral infections: EB Virus causative factor for ↑ incidence of nasopharyngeal cancer
- HPV 16: in >50% of oropharyngeal cancer → Better clinical outcome in tumours positive to HPV DNA(E6 &E7)

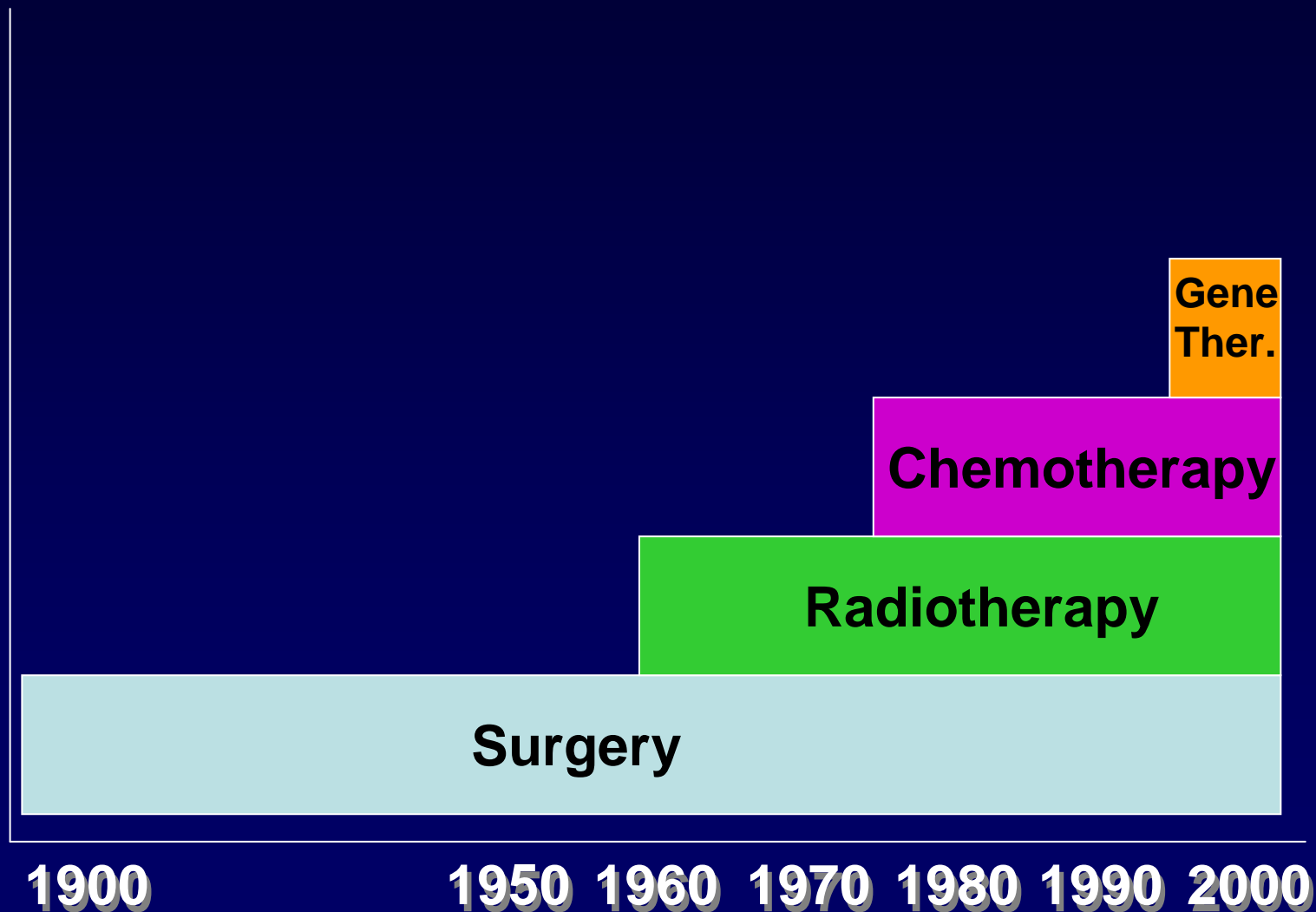
Field Cancerization

- Typically found in Cancer of head and neck (especially oral and pharyngeal cancers) and urinary bladder
- Multiple cancers throughout upper aerodigestive tracts
- Occurs in patients with heavy tobacco and alcohol exposures
- Molecular studies point towards a common clonal progenitor cell with an early molecular alteration
- Treated patients have High risk (3-4%/yr) of developing metachronous tumours
- **Chemoprevention** can reduce this risk

Studies done in India

- **Studies by Sankaranarayan, Nair et al:**
 - i) established causative role of bidi and cigarette smoking and alcohol drinking in Indian population of oral, pharyngeal & laryngeal cancers
 - ii) Quantitative estimation of risk done also
- **Studies by P.C.Gupta et al:** showed reverse effects of stopping tobacco in intervention trials
- **Recent study by Gangadharan from Kerala:** showed trends of decreasing incidence of H&N Cancer (possibly due to less tobacco use)

Development of Multimodal Therapy for Head & Neck Cancer



Cancer Toll

- Pain and misery
- Over 70% of cases are detected late and report for treatment in very advanced stages.
- Economic impact of this disease is catastrophic. For example, it costs Indian Rupees 3,50,000 (Rs. 3.5 lakhs) [ICMR Task Force Study, 1999], to treat one tobacco-related cancer.

Opposite Trend in Developed Regions

Mortality from cervical cancer is uncommon in developed countries. *In 1989 in the United States, mortality from cervical cancer was only 3.1 per 100,000 women per year.* This low mortality from cervical cancer can be attributed to early detection of and elimination of precancers, by periodic cytologic screening with Papanicolaou smears.

Theoretically, periodic cytologic screening can prevent 90% of invasive squamous cancers of the cervix.

Two Terms

Two terms that are commonly used in the context of cancer prevention are:

- **Predictive Oncology**
- **Preventive Oncology**

Predictive Oncology

Predictive oncology encompasses **primary** cancer prevention by assessment and control of the basic mechanisms that may lead to the development of neoplastic diseases.

Predictive Oncology

Primary prevention activities are important because many cancers are preventable. Tobacco and diet-related risk factors alone account for about half of fatal cancers in Ontario.

Tobacco, diet and physical activity are the most important targets for cancer prevention.

Predictive Oncology

Predictive oncology for primary prevention of cancer, involves:

- **role of multistage cofactorial exposures**
- **identification of avoidable risk factors**
- **molecular biology of cancer susceptibility**
- **genetic predisposition to cancer**
- **prognostic assessment of occult, incipient and advanced neoplasms**
- **prediction of response to anticancer therapies**
- **genetic markers**
- **assessment of exposure to carcinogens**

Predictive Oncology

Successful primary prevention strategies for cancer reduce the likelihood that cancer will develop in the first place

- by modifying risk factors related to lifestyle, the environment and occupation, and
- by working towards healthy public policies to create the conditions in a variety of settings where making the healthiest lifestyle choices are easier to do.

Predictive Oncology

Lifestyle choices play a major role in the development and progression of a number of chronic diseases, in particular cancer.

Research has found that plant-based diets, regular physical activity, and the use of stress reduction techniques can prevent cancer, increase disease-free survival, and improve quality of life in cancer patients.

Preventive Oncology

Preventive oncology for ***secondary*** prevention focuses on routine clinical and laboratory procedures for early detection and treatment of cancer, patient management and education, management of curable lesions, education and lifestyle modification.

Preventive Oncology

Preventive oncology for secondary prevention of cancer, involves:

- screening modalities and their cost effectiveness
- methodological issues of cancer detection
- public awareness and professional education
- screening guidelines for cancer detection
- management of patients with preneoplastic alterations
- management of early curable neoplasms
- novel therapeutic approaches

Screening

Screening appears to be the sheet anchor for prevention of cancer.

The process of Screening implies a search for unrecognized disease in an apparently well individual.

Screening

Two means are available for screening of the people:

1. The cancer care providers can go to the people
2. Utilize the people's usual visits to the health services

Cancer care providers go to the people

This is not a practical proposition because:

1. Ours is a country with a billion people
2. Cancer is not the only pressing health problem; the individual is going to have to be contacted by the Preventive Cardiologist, the Preventive Nephrologist, the Preventive Gastroenterologist and so on and so forth; *this is plainly ridiculous.*

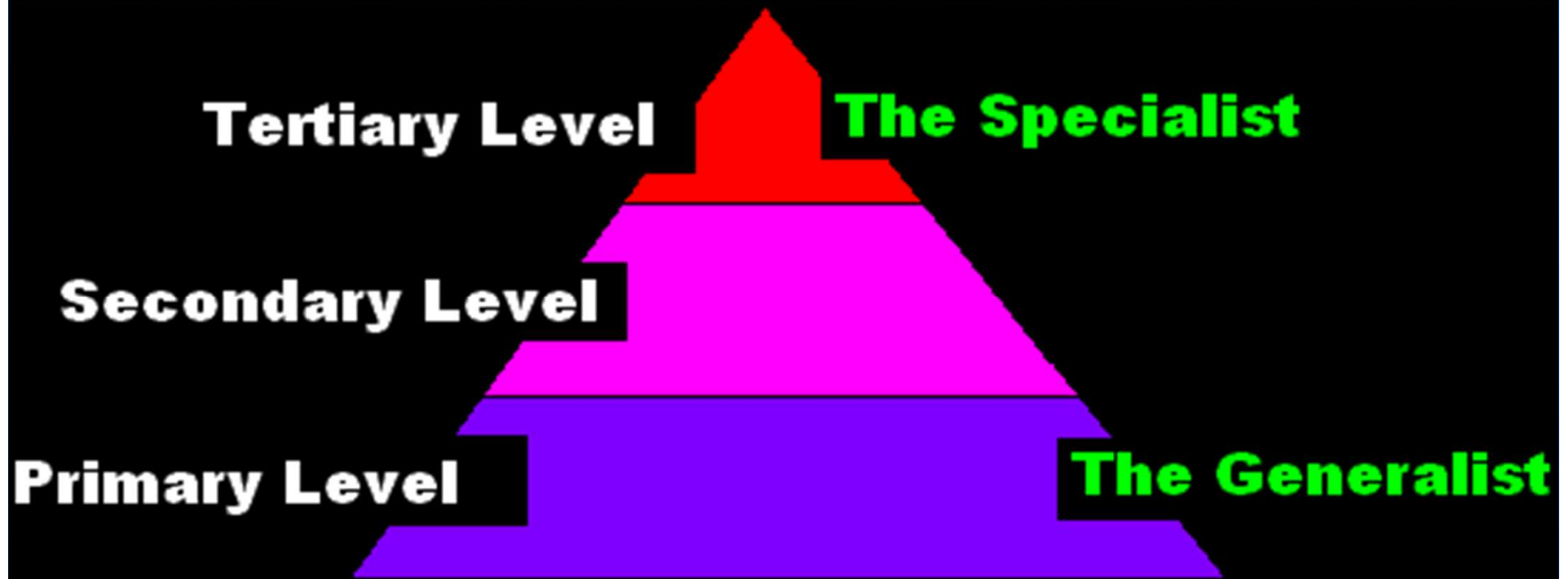
Utilize people's visits to health services

This is a more practical proposition because:

1. This recognizes the logic of bottom-up approach
2. A generalist need to be involved to provide first contact care, and he needs to be oriented well about preventive oncology.
3. Specialists in curative cancer care need enter the picture at the referral level for providing his unique expertise in specialized care, and, what is much more important and need be emphasized particularly, also for imparting periodic training inputs to the generalist.

Utilize people's visits to health services

The bottom-up approach:



Preventive Oncology Research

Multidisciplinary endeavor involving these disciplines:

- **nutritional science,**
- **behavioral science,**
- **epidemiology,**
- **biostatistics,**
- **health education and health psychology,**
- **clinical medicine,**
- **nursing etc.**

Challenges of Preventive Oncology

The challenges are for:

- traditional health care structure, process, equity and access,
- non-traditional health care such as complimentary and alternative medicine,
- individual and societal ethics,
- resource allocation,
- organizational and community planning and action, and
- governmental health policy.

To achieve success in cancer prevention, we must take the initiative, personally and collectively.

Challenges of Preventive Oncology

To achieve success in cancer prevention, we must take the initiative, personally and collectively.

Thank you

