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Review Article

Epidemiology of head and neck neoplasms: a review

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ABSTRACT

Head and neck malignancy is the sixth common type of cancer, representing about 6% of all cases and accounting for an estimated 6,50,000 new cancer cases and 3,50,000 cancer deaths worldwide every year. An overview of the problem with emphasis on its global epidemiology is being reviewed.

Keywords: Squamous cell carcinoma, Head and neck, Epidemiology

INTRODUCTION

Malignancy of the head and neck region has significant morbidity and mortality (6.5%) throughout the world. This includes malignancies arising from the epithelium of the upper aerodigestive tract as reported by Parkin.[1] The International classification of diseases (ICD) is the standard diagnostic tool for epidemiology, health management and clinical purposes, and is used to monitor the incidence and prevalence of diseases including cancer. In the 9th revision of the ICD-9, the term head and neck cancer covers malignant neoplasm's of the lip (ICD-140), tongue (ICD-141), gums (ICD-143), floor of the mouth (ICD-144), buccal and other unspecified parts of the mouth (ICD-145), oropharynx (ICD-146), hypopharynx (ICD-148), larynx (ICD-161) and other head and neck sites (ICD-149), reported by Chen et al.[2] Squamous cell carcinoma represents more than 95% of all head and neck cancers.

In a study by Agiris et al, distant metastasis at initial presentation is uncommon and seen in about 10% of patients.[3] The Rhee et al study squamous cell carcinoma affects the functional, cosmetic and psychological aspects of the patients.[4] An overall 5-year survival rate for head and neck cancer patients, among the lowest, Hardisson.[5] Relative five year survival rate for head and neck cancer is 57.1% Piccirillo et al.[6] The 5-year survival rates range from 36% to 60%, with up to 10-year survival rates from 40% to 56% being reported, by Desai et al.[7] Malignancies in developing countries have a fatal outcome as they are generally diagnosed at a late stage with limited facilities for early detection and treatment Parkin.[1]

70-80% patients present with locally advanced disease, with lymph node involvement in approximately 30-50% patients Stupp et al.[8]

REVIEW OF LITERATURE

Head and neck cancer represents a significant health concern in India. More than 2.5 lakh patients are diagnosed with head and neck cancer every year, of which 75% are in the advanced stage by Desai et al.[7]

Head and neck malignancy is the sixth common type of cancer, representing about 6% of all cases and accounting for an estimated 6,50,000 new cancer cases and 3,50,000 cancer deaths worldwide every year. The overall most common cancer among males is lung cancer and among

females is breast cancer Parkin et al.[1] The World Health Organization (WHO) estimated the global incidence rate for cancer of the head and neck in 2000 to be 14.27 per 100,000 by Chen et al.[2] In India the incidence of new cases of head and neck cancer is 53,251 and cancer death is 43,413 by Piccirillo et al.[6]

The global scenario

The incidence distribution of cancers in head and neck, anatomical subsites varies markedly in different geographical regions. It is prevalent in South-east Asia, comprising 30-40% of all malignancies in India, compared with 2-4% in Western countries by Daftray et al and WHO.[9] High risk regions for head and neck cancer include Somme, France, for males and Bangalore, India, for females, with age standardized incidence rate of 43.1 and 11.2 per 100,000 respectively. It represents a major form of cancer in India, accounting for 30% of all cancers in males and 11-18% in females, Indian council of medical research (ICMR).

The Indian scenario

A study of 122273 cancerous patients was conducted by ICMR, in 5 different metropolitan cities of India including Mumbai, Bangalore, Chennai, Thiruvananthapuram and Assam. In Mumbai, mouth (17.5%) was the leading site of cancer, followed by tongue (9.4%), hypopharynx (5.9%) and larynx (4.6%). In Bangalore, mouth (15.8%) was the leading site of cancer, followed by hypopharynx (10.9%), tongue (6.4%) and larynx (4%). In Chennai, mouth (14.1%) was the leading site of cancer, followed by hypopharynx (10%), tongue (8.5%) and larynx (4.2%). In Thiruvananthapuram, mouth (15.3%) was the leading site of cancer, followed by tongue (8.7%), larynx (4.9%) and hypopharynx (3.4%). In Assam, hypopharynx (19.3%) was the leading site of the cancer, followed by mouth (14%), tongue (7.8%) and larynx (4.9%).[7]

The disproportionately higher incidence of carcinoma of head and neck in relation to other malignancies in India is due to the prevalence of risk factors such as use of tobacco in various forms by Mehrotra et al.[10] Cancers of tongue and buccal mucosa predominate in developing countries by Liao et al, Daftary et al and WHO, in contrast to cancers of floor of the mouth.[9,11] Cancer of gum or tongue is being rare in the west by Daftary et al and WHO.[9] There are marked racial differences in the incidence of head and neck cancer. The African-American males have a higher incidence of oral and oropharyngeal cancers than the Caucasian males by Hayat et al.[12]

Trivedi et al conducted a retrospective study at Mazumdar-Shaw cancer center, Narayana Hrudayalaya, Bangalore, India, on 450 patients, cancer was the most common site (67%) at presentation and second most common was laryngopharynx (26%). Buccal mucosa was the most common subsite followed by tongue cancer.[13]

In a study of 150 patients of cancers in the state of Punjab, carcinoma hypopharynx (20%) was found to be the most common tumor, followed by cervical lymphadenopathy (20%), carcinoma oropharynx (10%), larynx (9%), oral cavity (6%), salivary gland (6%), ear (5%), sinonasal (5%), eye (5%), skin (4%), nasopharynx (4%) and thyroid (4%) by Gupta et al.[16]

Gender contributes to variations in incidence of carcinoma of the head and neck, with 66-95% cases occurring in males. Squamous cell carcinoma of the head and neck accounts for 40% of all cancers seen amongst males in our country, ICMR.

The male-female ratio is currently 3:1 for oral cavity and pharyngeal cancers by Marur and Forastiere.[14] The most extreme example is cancer of larynx, for which the incidence rate is 7 times higher in men than in women by Mackay et al.[15]

The incidence and death rates from most diseases worldwide is inversely related to socioeconomic status. Cancer patients with low socioeconomic status have more advanced cancers at diagnosis, receive less aggressive treatment, and have a high risk of dying in the five years following diagnosis of cancer by Mackay et al.[15]

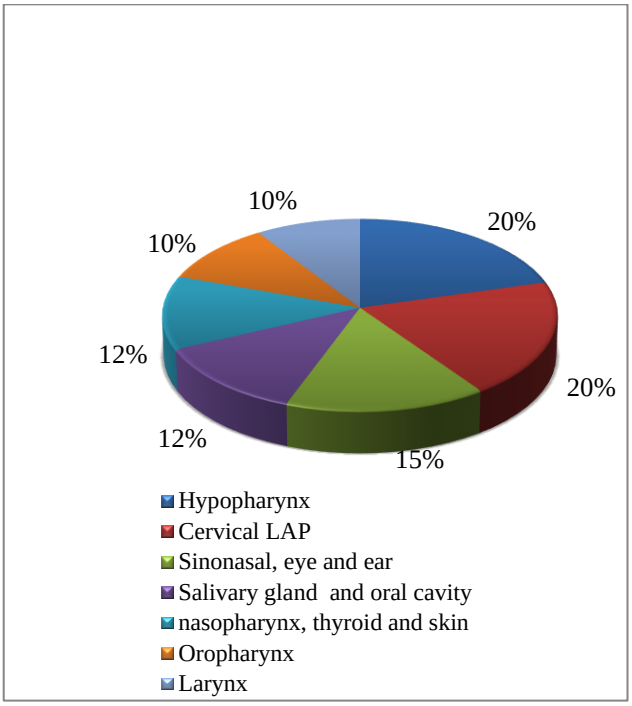

Figure 1: Distribution of head and neck carcinoma in the state of Punjab.[16]

Head and neck neoplasia - classification

Head and neck neoplasm can be divided into benign and malignant tumors. In children, 90% of neck masses are benign out of which 55% are congenital.

Benign neck swellings can be further classified into congenital and acquired. Thyroglossal cyst, lymphangioma, dermoid cyst, branchial cyst and fistulae, haemangioma, thymic cyst are common congenital masses by Donnell 2000.[17]

The predominant acquired benign masses are the ranula, laryngocele and pharyngo-esophageal diverticula by Donnell.[17]

Malignant neck swellings can be sub-divided into those in the midline and on lateral aspects of the neck by Goepfert.[18]

The midline group is constituted by metastatic submental lymph node, tumor of thyroid isthmus, enlarged Delphian node, suprasternal lymph node and the aberrant thyroid by Donnell.[17]

In the lateral group (anterior and posterior triangles) submandibular gland tumor, metastatic submandibular and jugular lymph nodes, thyroid lobe tumors, carotid body tumors, parotid swellings and lymphomas are commonly noted. In the supraclavicular triangle, benign swelling like cystic hygroma (lymphangioma) is common. Sternomastoid tumor, subclavian aneurysm and cervical rib are neither benign nor malignant neoplasm, but present as swellings in this region. Metastatic nodes from infraclavicular areas like breast, lungs, gastro intestinal tract, kidney, ovaries and testis are frequently seen by Donnell.[17]

Upto 12% of primary childhood malignancies are in the head and neck area. Lymphoma predominates in all series with (84%), followed by thyroid and neural tumors, 70% each. Sarcomas (54%) and salivary gland tumors (40%) are less common and squamous cell carcinomas (<5%) is quite rare by Albright et al.[19]

Head and neck neoplasia age and gender distribution

After 50 years of age incidence of cancer in particular for tumors originating from epithelial cells increases with aging by Miyaishi et al.[20] Although most cases are reported between 55 to 70 years of age, head and neck cancer in younger patients is quite common. Considerable increase in incidence of cancer at the base of tongue and tonsil, in people below 45 years of age, has been attributed to increasing prevalence of human papillomavirus (HPV) infection in developed countries by Agiris et al.[3]

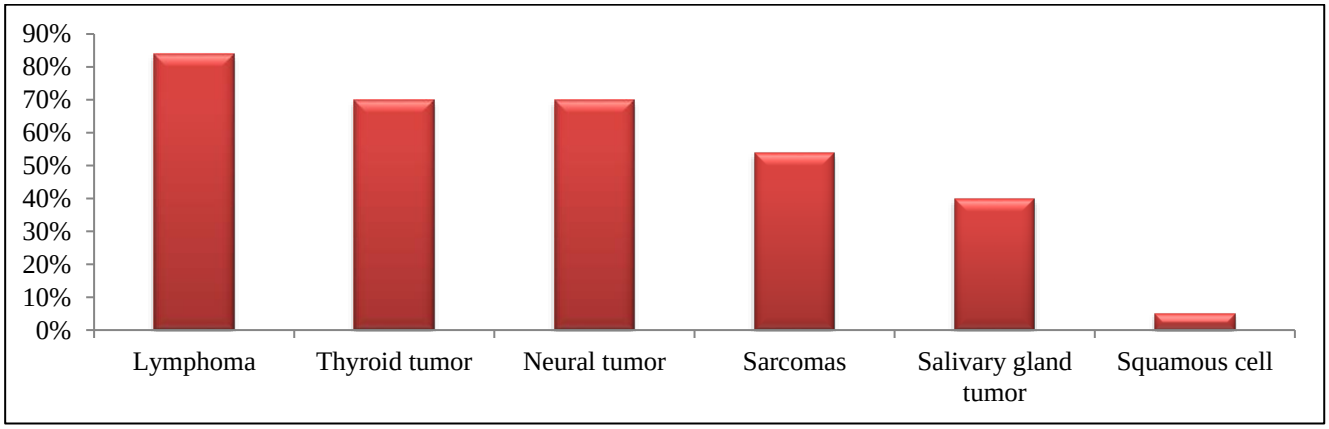

Figure 2: Incidence of childhood malignancies.[19]

Several theories have been proposed to determine an association between age and cancer, including those related to increased susceptibility to chemical carcinogenesis, weakened immune response by Ershler, defects in DNA repair and glutathione deficiency in ageing tissues by Richie.[21,22] It has been proposed that this association is due to accumulated exposure to carcinogens over a lifetime. It is likely that increased risk of cancer because of age may be a function of multistage, multifactorial carcinogenesis resulting from accumulated genomic insults over a number of years by Doll and Peto.[23]

CONCLUSION

In the last twenty years, early diagnosis is possible through high resolution imaging and sophisticated histopathological techniques. The therapeutic modalities surgery, radiotherapy and chemotherapy have developed immensely, but with marginal improvement in survival rates. An overall 5-year survival rate for head and neck cancer patients, is among the lowest, ranging from 36% to 60%, with up to 10-year survival rates from 40% to 56% being reported by Desai et al.

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