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## Head and neck cancer (HNC): Malnutrition

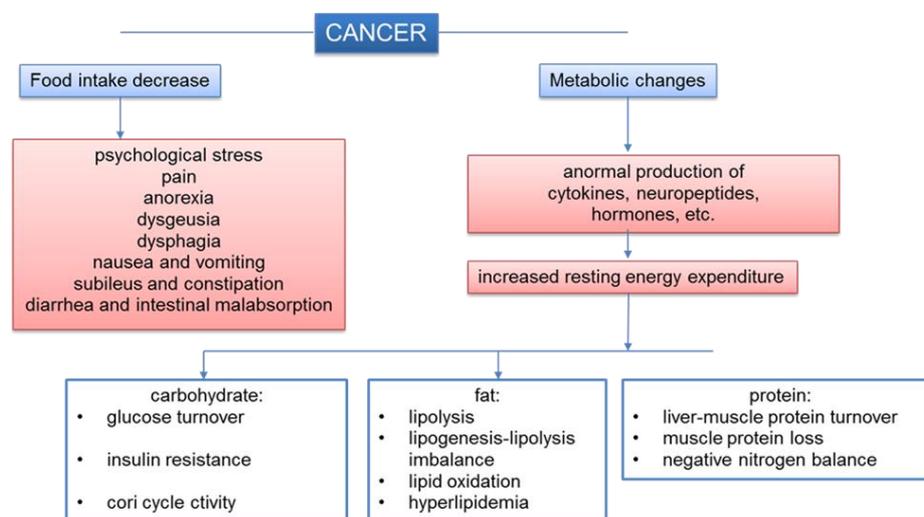
**Kavita Verma and Sushila Verma****Abstract**

Cancer is a complex disease involving abnormal cell growth (neoplasia) and numerous temporal changes in physiology, which ultimately lead to malignant tumours. Tumour cells are invasive in nature which spread to the surrounding tissue and distant organ causing high rate morbidity and mortality (Seyfried *et al.*, 2010). The development process of cancer is a multistep that occurs in three stages initiation, promotion and progression (Marian *et al.*, 2010).

**Keywords:** cancer, neck, malnutrition, head**Introduction**

Cancer patients are particularly susceptible to nutritional depletion due to the combined effects of the malignant disease and its treatment (Amaral *et al.*, 2008; Paccagnella *et al.*, 2010)<sup>[1, 20]</sup>. The consequences of malnutrition may include an increased risk of complications, decreased response and tolerance to treatment, impaired quality of life and decreased survival rate (Ottrey, 1996; Nitenberg *et al.*, 2000)<sup>[19, 17]</sup>. Factors affecting a person's food intake, such as difficulties swallowing and loss of appetite play an important role in quality of life (Hickson *et al.*, 2004)<sup>[10]</sup>.

The prevalence and magnitude of a diminished nutritional status varies with individual treatment regimens, it is widely accepted that the principal causes related to therapy are the result of commonly experienced side effects such as nausea, vomiting, anorexia, lethargy, diarrhoea, esophagitis, and dysphasia (Kyle *et al.*, 2005; Odelli *et al.*, 2005)<sup>[14, 18]</sup>. The cancer burden continues to increase due to adoption of lifestyles and behaviours that increase the risk of getting cancer and the increase in population causing strain resources pushing the economies to produce more that causes pollution and also increases exposure of masses to carcinogens (Jemal *et al.*, 2011)<sup>[11]</sup>. Cancer can alter metabolism of nutrients, thus leading to development of symptoms and disturbances of the Gastro Intestinal Tract (GIT) leading to malnutrition (Nitenberg *et al.*, 2000)<sup>[17]</sup>.



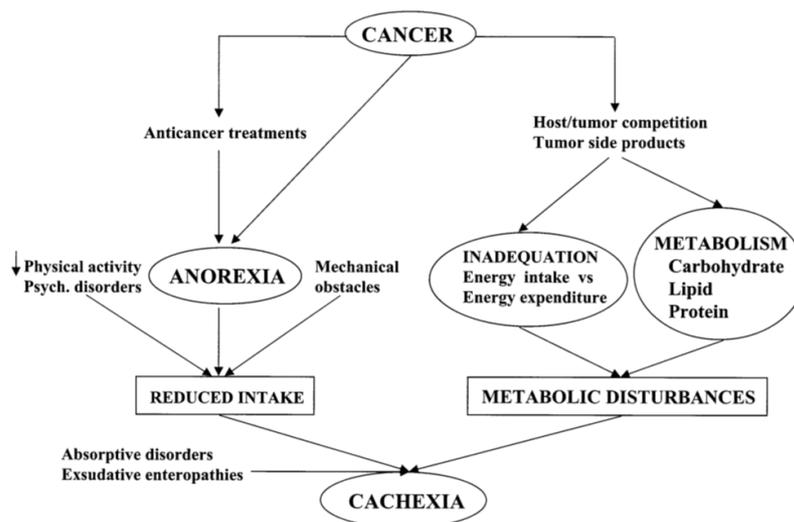
**Fig 1:** Multifactorial etiologies for body weight loss and metabolic abnormalities in cancer patients (Caro *et al.*, 2007)

Malnutrition in cancer patients, also known as cancer cachexia is due to cytokine-induced metabolic derangements (Marian *et al.*, 2010). Anorexia, or the involuntary decline of food intake, occurs in at least half of newly diagnosed cancer patients.

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Mechanical anorexia, such as the inability of patients with esophageal cancer to consume adequate energy, is a major contributor to the development of malnutrition but often can be overcome by enteral feeding. Cancer cachexia is a complex

metabolic syndrome in which patients experience anorexia, early satiety, weakness, anaemia, sarcopenia, and severe weight loss (Fearon *et al.*, 1998; Herrington *et al.*, 1997; Giacosa *et al.*, 1995)<sup>[8, 6, 9]</sup>.



**Fig 2:** Mechanisms of cancer cachexia. Cancer cachexia results from the combination of multiple events (Nitenberg *et al.*, 2000)<sup>[17]</sup>

Head and neck cancers (HNCs) are the 10th most prevalent cancer type in the world (Semple *et al.*, 2002)<sup>[21]</sup>. Head and neck cancer is a broad term that encompasses epithelial malignancies that arise in the paranasal sinuses, nasal cavity, oral cavity, pharynx, and larynx. Almost all of these epithelial malignancies are squamous cell carcinoma of the head and neck (SCCHN), for which the most important risk factors are tobacco and alcohol consumption (Argiris *et al.*, 2003)<sup>[2]</sup>. There are four anatomical subsites of the upper aerodigestive tract. They are the oral cavity, oropharynx, hypopharynx, and larynx. The oral cavity is defined by the lips anteriorly, the hard and soft palate junction superiorly, and the circumvallate papillae inferiorly (Bailey, 1998)<sup>[4]</sup>. The oropharynx is defined by the circumvallate papillae anteriorly and the posterior pharyngeal wall posteriorly. An imaginary line through the hard palate and another imaginary

line through the hyoid bone define the superior and inferior limits of the oral cavity (Bailey, 1998)<sup>[4]</sup>. The hypopharynx begins at the imaginary line drawn through the hyoid bone superiorly and extends inferiorly to the inferior border of the cricoid cartilage (Bailey, 1998)<sup>[4]</sup>. The larynx is divided into supraglottic, glottic, and subglottic regions. The supraglottic larynx extends from the tip of the epiglottis to the laryngeal ventricles. The glottis starts at the ventricle and extends to 5mm below the free edge of the true vocal cords (Fried *et al.*, 1998)<sup>[7]</sup>.

**Symptoms**

Hoarseness, sore throat, tongue pain, mouth ulcer, poorly fitting dentures, otalgia, dysphagia and odynophagia, cough, mouth bleeding, stridor.



**Fig 3:** various stages of squamous cell carcinoma of the head and neck

(A) Premalignancy evidenced by leukoplakia on the right true vocal fold; (B) early oral tongue cancer in a young, non-smoking woman; (C) stage T2 laryngeal carcinoma, potentially treatable with radiation or surgery; and (D) pathology specimen post-total laryngectomy, which is a standard procedure for large volume, destructive laryngeal cancers (Argiris *et al.*, 2008)<sup>[3]</sup>.

According to Soeters (Soeters *et al.*, 2008)<sup>[23]</sup>, malnutrition is a subacute or chronic condition, in which variable combinations of nutritional imbalance and inflammatory processes are responsible for modification of the body composition (reduction of muscle mass and fat mass) and alteration of organ functions (immune, muscle and cognitive deficits). Treatments for patients with HNCs are some of the

most debilitating and disfiguring among all cancer treatments, and patients often go on to live with chronic functional impairment. For these reasons, HNCs have been described as more emotionally traumatic than any other form of cancer (Koster *et al.*, 1990) <sup>[13]</sup>. However, limited research has been undertaken to assess the rates of psychological distress and unmet psychosocial needs among patients with HNCs. Psychological distress can be described as a combination of symptoms, including anxiety, mood, cognitive, and behavioural impairments (Kállay *et al.*, 2007) <sup>[12]</sup>.

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