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Nutritional requirements in HNC cancer cases undergoing surgery: A narrative review.

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Abstract

Malignant tumours arising from different sites of the upper aero-digestive tract like the paranasal sinuses and the salivary glands constitute the Head and neck cancer (HNC). Today newer guidelines are available that can serve to assess the nutritional requirements of HNC. Dieticians are able to estimate and achieve the nutritional requirements for HNC patients through set equations provided for cancer patients. Nutritional assessment is missed out in many of the cases, unless anorexia and cachexia is very severe. Therefore the assessment of the feasibility of criteria for nutrition support is essential to be evaluated. This paper highlights the need for nutritional consideration among HNF cases.

Keywords: HNC, cancer, therapy, nutrition.

Introduction

Malignant tumours arising from different sites of the upper aero-digestive tract like the paranasal sinuses and the salivary glands constitute the Head and neck cancer [HNC]. It is the 5th most common form of cancer in the world.[1] The World Health Organization report states that an increase cancer burden worldwide, is owing to several factors like growth of population, ageing and an altered social and economic condition. This is much true in the rapidly growing economies. A paradigm shift is seen in cancer cases that were poverty and infection related to cancer cases associated with lifestyles that are typically seen in the industrialized nations.[2] The major causes of cancer include tobacco [smoking and smokeless form], Human Papilloma Virus [HPV]. A few other include genetics, diet, pollutants and other chemicals.[3] Early stage HNC can be treated with surgery or radiotherapy. This is the standard protocol. At times chemotherapy or chemoradiotherapy may also be required for certain patients with locally advanced forms of cancer. A multidisciplinary team-based approach is quite beneficial for such patients. They show an overall improved survival rate.[4] The multidisciplinary team involves an oral surgeon, oncologist, plastics surgeon alongside also a dietician. Taberna and colleagues state that, treatment for HNC patients must be concentrated in a high volume, multidisciplinary and specialized centres.[4] Despite specialized cancer therapy guidelines available based on the anatomical site and type of cancer, there were no specific guidelines as far as specific HNC patients are concerned for nutrition.

Discussion

The effects of malnutrition

Nutrition is an essential part of treatment of cancer patients during the treatment, especially for head and neck cancer. Almost 50% of Head and neck cancer [HNC] patients experience malnourishment even before the start of the treatment. The susceptibility rate to malnourishment is very high among these patients.[5] The main aim of nutritional support in HNC cases is to assist in better response to the therapy [chemotherapy/ radiotherapy or surgery] and subsequently help to improve the quality of life [QoL] of these patients. The guidelines by ESPEN states that since malnourishment and loss of muscle mass are a common feature seen in cancer patients, they tend to have a negative outcome on the clinical success of

the cases determined by the rate of improvement and avoidance of post therapeutic complications.[6] Therefore there is an impending need to screen all cancer patients especially those with HNC cancer at all stages for the presence of nutrition-based risks. Table 1 lists the different morbidities associated with malnourishment in HNC cancer patients.[5]

Table.1 : Morbidities associated with malnourishment in HNC cancer-

Serial number	Morbidity
1.	Increased risk of infection
2.	Delayed wound healing
3.	Impaired function of cardiac and respiratory systems
4.	Muscle weakness
5.	Depression
6.	Poor QoL
7.	Increased risk of post-operative complications
8.	Reduced response to chemotherapy and radiotherapy
9.	Increased mortality rate
10.	Delayed wound healing
11.	Impaired function of cardiac and respiratory

Dietary intervention and HNC:

Table 02 lists the recommendations for cancer patients in terms of nutrition assessment and supplements.[7]

Table. 2: Recommendations for cancer patients in terms of nutrition assessment and supplements-

Screening and nutritional assessment
1. All cancer patients should be screened at the time of diagnosis and throughout treatment using a validated malnutrition screening tool 2. Nutritional assessment is recommended for all patients who are identified to be at risk for malnutrition by nutrition screening
Energy and nutritional requirements
Proteins, water, and minerals requirements should be evaluated especially in certain situations. The administration of high-doses of vitamins and trace elements is not recommended
Types of nutritional interventions
1. Nutrition counselling should be recommended to all cancer patients who able to eat, but are malnourished or at risk for malnutrition 2. Enteral nutrition, if oral intake remains inadequate despite nutritional counselling, and parenteral nutrition, if enteral nutrition is not sufficient or feasible 3. The use of fish oil in malnourished patients with advanced cancer receiving chemotherapy 4. The use of enteral immuno-nutrition in cancer patients undergoing upper gastrointestinal surgery Dietary modifications include use of oral nutritional supplements and fortified food products. Also texture of food needs to be altered for HNC patients to aid them in easy deglutition process. The early dietary intervention can help to prevent delayed wound healing and faster recovery.

Interventions relevant to specific patients' categories

There are specific interventions recommended for specific categories of patients.[7] These include-

1.Management within an ERAS program is recommended for all cancer patients undergoing either curative or palliative surgery.

2.In severe mucositis or in obstructive tumours of the head-neck or thorax, enteral feeding is recommended using nasogastric or gastrostomy tubes.

3.During anticancer drug treatment, personalized dietary counselling, with oral nutritional supplements if necessary, is recommended in cases of frank malnutrition and patients with decreased oral intake.

4.Malnourished cancer patients who are expected to be unable to ingest and/or absorb adequate nutrients for more than 1–2 weeks are candidates for enteral nutrition.

5.In advanced terminal phases of the disease, artificial nutrition is unlikely to provide any benefit for most patients.

6.In cancer survivors: maintaining a BMI between 18.5 and 25 kg/m2, physical activity, and a healthy diet.

Once the nutritional requirements have been established for a case, there are different options like dietary texture modifications as well as use of oral supplements for nutrition.

Oral Nutrition Supplements [ONS]

ONS [Oral Nutrition Supplements] prescriptions are available in a wide range of products. They help to reduce malnutrition induced complications such as delayed wound healing and opportunistic infections. Reports related to ONS as an option in surgical treatment is not reported as an effective method in the UK. A meta-analysis report suggested that when administered for 6- 70 days, the total energy intake of the cancer patients increased overall especially in radiotherapy cases.[8] Still studies are required to see long term effects of ONS on different parameters among HNC patients with different grades and treatment approaches of rehabilitation. Nutrition intervention is essential as an adjunct to any treatment.[9]

HNC and dietary modifications

In HNC cases, Gastrostomy tubes are considered as the best possible option, unless the enteral nutrition is done for 1 or 2 weeks. A randomized trial compared the effectiveness of Percutaneous endoscopic gastrostomy [PEG], surgically-inserted [open/laparoscopic] gastrostomy [SIG] and radiologically inserted gastrostomy [RIG]. Greater percentage of complications and death were seen with the RIG [7%] than with PEG [0%].[10] Contrasting results emerged out of a meta-analysis, where the rate of fatality and complications were more with PEG than with RIG.[11] Nasogastric tubes are used in case the enteral nutrition is for less than 28 days. But patient discomfort and a high risk of aspiration associated with nasogastric tube, favours PEG.[12] However another Cochrane review did not find sufficient evidence to suggest any superiority among the different tubes used.[13]

A meta- analysis suggested higher evidence for improved wound healing in cases of enteral feeding.[14] Bolus feeding is used in cases with nasogastric tube or gastrostomy feeding tubes. In patients who have naso or gastrojejunal or jejunal feeding tubes; continuous feeding is followed. A calorie count of 25- 35 kcal/kg/day is maintained.[15]

Food texture and consistency modification may affect all aspects of nutrition supplement [from intake to absorption].[16] Food fortification is increasingly being considered in cancer cases. The European Prospective Investigation into Cancer and Nutrition [EPIC] study in 2009 reported that there is underreporting of low- energy intake among people across Europe [including UK]. No literature evidence with regards to intake of energy or food fortification is available specifically to the different regions.[17] The current recommended guidelines advise the need for a dietician on the team for such cases.

Overall Goals of Nutrition Management in HNC patients

The major goals of the nutritional management should focus on the following factors

[18]-

1. Maintaining body weight
2. Minimize weight loss
3. Preserving muscle tissue
4. Prevent the nutrition- impact symptoms- loss of appetite, changes in bowel function
5. Help improve the Quality of Life of the patients

One must consider all HNC cases as “at risk” patients for nutrition related issues, irrespective of the grade and type or cancer.[18]

Table 03 highlights the current/latest requirements of energy, carbohydrate, proteins, fat and vitamins in HNC.

Table 03: Nutritional requirements in HNC

Nutritional factor	Requirement level
Energy	23-33 kcal/kg/day [Parenteral & Enteral Nutrition Guide [PENG] 2019]
Carbohydrates	No specific recommendation[19]
Proteins	1-1.2 gram/kg body weight [20]
Fats	No specific recommendation[5]
Vitamins	No specific recommendation [5]

Reduced nutritional status can be seen from the initial diagnosis which may exacerbate due to treatment related toxicities. Complications arising out of this may persist for a longer duration. Hence assessment of the nutritional status must be a part of the routine monitoring process for HNC patients. An early intervention can help to minimize the co morbidities associated with HNC treatment.[21] The European recommendations are the only set of guidelines that focus on HNC patients. Even though other guidelines are there, they are more general and not pertaining to a particular system affected or the specific therapy for cancer.

HNC patients are different from the other cancer types, due to the complex nature of the systems involved. Major chances of complications [local and systemic] can arise post HNC surgery like scar, pain, delayed wound healing, localized infection.

Conclusion

Nutrition assessment of these patients is essential part of a multi-disciplinary approach to treatment. A failure of such an assessment can increase the complications and increase mortality rates. This assessment forms a part of pre as well as post-surgical period. Studies have reported quite contrasting outcomes with respect to the assessment techniques as well as the routes feeding. Different schools of thoughts can result in a neglected role of dietician in cancer therapy and also delay the physical as well as psychological healing of the patients; and also their quality of life, where diet is an important component. The recent ESPEN guidelines have been proposed for assessment for HNC cases, very little evidence is present on the feasibility of these guidelines to be used as an integral part of day-to-day practise. Training and regular appraisal for the medical team is needed in terms of dietary requirements and its importance for HNC patients. Peri-operative nutrition support is more important in patients undergoing surgery. Hence, Immunonutrition is the best approach for supporting the malnourished surgical cases. This should be

appraised as an essential aspect of perioperative care.[22]

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