Nutritional Management of Patients with Head and Neck Cancer: Integrating Research Into Practice

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Abstract
Malnutrition is known to be a problem in head and neck cancer throughout all phases of treatment and rehabilitation. Nutrition interventions have demonstrated beneficial intermediate outcomes. Despite this, nutrition services for this patient group are not consistent across Australia. Routine screening procedures should be implemented in multidisciplinary head and neck clinics and treatment areas to identify patients who are at nutritional risk. Close collaboration is particularly important for the speech pathologist and dietitian in order to manage dysphagia and its nutritional consequences. Guidelines for the nutritional management of these patients will assist in service provision. Early referral to a dietitian and speech pathologist, combined with good symptom management by the healthcare team, are crucial to optimising nutrition outcomes.

The prevalence of malnutrition in patients with cancer is the highest of all hospital patient diagnostic groups1 and it is well recognised that patients with head and neck cancer are among those at highest nutritional risk. Even before treatment commences 25–50% of patients have markedly reduced nutritional status.2,3,4

Malnutrition is associated with increased risk of infections, decreased response to treatment, poorer quality of life (QoL), increased healthcare costs and a shorter survival time.5,6 Weight loss during radiation therapy to the head and neck can place at risk the safety and effectiveness of the treatment, requiring repeat CT scans in order to keep critical structures to accepted tolerance doses and emergency admissions to hospital for nutrition-related and dehydration problems are commonly reported during treatment.7 An inability to eat and drink adequately places a significant burden on both the healthcare system and the psychosocial well-being of the patient and their carers.

Causes of Nutritional Depletion
Some patients are already malnourished at presentation due to eating and drinking difficulties caused by the tumour location or pre-morbid lifestyle. Nutritional status can then be further compromised due to treatment side-effects. Adapting the texture of meals is more difficult for a person if they have limited food preparation skills, cooking facilities and/or social supports. These are common features of this patient group, especially when treatment often means many weeks away from home.

The mode of treatment will affect nutritional outcomes. The effect of surgical intervention on swallowing is dependent on the degree and site of resection. Resection of the floor of mouth or base of tongue places a patient at greater risk of requiring supplemental feeding.

Radiotherapy and chemotherapy have both acute and long-term impacts on functional swallowing and nutritional status. Side-effects include mucositis, odynophagia, xerostomia, trismus, pharyngeal fibrosis and changes in taste and appetite.8,9 These changes not only affect a person’s desire to eat, but also reduce the effectiveness of chewing, bolus cohesion and pharyngeal clearance. The removal of teeth further exacerbates these difficulties.

Swallowing function deteriorates in the early post-treatment period, then improves up to 12 months post-treatment when it subsequently stabilises commonly at a level lower than pre-treatment.9,10 There is a trend towards organ preservation management where increased intensity radiotherapy or chemotherapy regimens are selected over surgical treatment with the expectation of improved function. Research into this area has revealed an increased early reaction which may last longer and be more severe.11,12 Anecdotal evidence suggests these patients tend to require dietetic and speech pathology support months after completing treatment and may not ever return to managing a “normal” diet without supplementation. Little research has examined the long-term effects on swallowing and nutritional outcomes.

The loss of the ability to enjoy a meal can be distressing. Nguyen et al13 showed that the severity of dysphagia in a group of 73 patients complaining of swallowing difficulties following a range of treatment modalities for head and neck cancer, correlated with compromised QoL, depression and anxiety.

Evidence for Benefits of Nutrition Intervention
It is often difficult, if not impossible, to meet the high levels of evidence according to National Health and Medical Research Council guidelines. As clinical nutrition
studies are difficult to complete in a blinded fashion, patients may not adhere to the nutritional recommendations and it may not be ethically possible to conduct a randomised, control trial (eg. in malnourished patients). Recent randomised control trials, however, have demonstrated improved outcomes from nutrition intervention for head and neck cancer patients undergoing radiotherapy. Ravasco et al. randomised 75 patients receiving pre-operative chemo-radiation to one of three groups. The first received dietary counselling alone, the second received commercial oral supplements and the third group remained on an ad lib diet. Both dietary counselling and oral supplement groups achieved increased protein and energy intake during treatment compared to those on an ad lib diet. Dietary counselling produced greater benefits in the medium-term (three months post-radiotherapy) than the simple provision of supplements. This is not surprising given the individual and changing nature of nutrition factors.

A study of 60 patients receiving radiotherapy to the head and neck or gastrointestinal tract compared intensive, individualised nutrition counselling by a dietitian, using a standardised protocol plus oral supplements as required, to the standard practice of the centre which was general nutrition advice, nutrition handouts and referral to a dietitian if considered necessary.4 The group receiving early and intensive nutrition intervention had less weight loss and less deterioration in nutritional status, global QoL and physical function.

These studies have demonstrated that the decline in nutritional status often reported for patients with head and neck cancer is not inevitable. Patients at risk of malnutrition ie. the majority of head and neck cancer patients, should receive regular and individualised nutrition intervention.20

For surgical head and neck cancer patients, pre-operative weight loss greater than 10% over six months is associated with increased complications. A number of studies have examined pre/post-operative nutrition support. There is considerable evidence that immune-enhancing enteral formulae reduce the likelihood of post-operative infectious complications in patients undergoing major gastrointestinal surgery,21,22 but evidence is less convincing for head and neck cancer.23-26 Pre-operative nutrition assessment assists in the identification of patients who are at risk of re-feeding syndrome due to extensive nutritional depletion, extended periods with minimal intake or abuse of alcohol. When good symptom management is unable to achieve adequate oral intake, tube feeding is highly effective. There is consistent evidence that any form of enteral feeding results in higher protein and energy intakes and weight maintenance compared with oral intake alone.27 Low level evidence, largely from retrospective studies, suggests that for high nutritional risk groups, gastrostomy insertion prior to cancer therapy provides some beneficial intermediate outcomes. Prophylactic gastrostomy insertion results in earlier commencement of nutrition support and less weight loss compared with insertion later during treatment.29,30 Patients with prophylactic gastrostomy tubes have fewer hospital admissions for dehydration or malnutrition and maintain QoL during treatment compared with oral intake alone.29,33

Both common routes of enteral feeding, nasogastric or gastrostomy, are equally effective in preserving weight,34,35 with nasogastric tubes recommended for short-term use and gastrostomies for periods exceeding one month. Nasogastric tubes can usually be inserted in an outpatient setting, but have a higher incidence of mechanical failure and aspiration.36 Gastrostomy tube insertion is a more invasive procedure, but one that is widely used with relatively few complications.36,37 The ability of the patient or their carer to manage home tube feeding must be assessed prior to insertion of any feeding tube and a system for regular follow-up and support is essential.20

There appear to be no universal standard criteria, however, to determine which patients should receive feeding tubes. The literature (Table 1) provides some evidence to inform the development of selection criteria for prophylactic tube placement.

Secondary analysis of the largest prospective evaluation of nutrition data in patients with locally advanced head and neck cancer undergoing definitive radiotherapy concluded that although patients who received nutrition support before starting radiotherapy had less weight loss and less grade 3 or 4 mucositis (despite being more likely to have a higher tumour stage) than those who did not, they had poorer overall survival.41 Given the methodological limits of this study, associations could not be considered causal. It does, however, highlight the importance of including mortality as an outcome in nutrition intervention studies.

**Screening and assessment**

As patients with head and neck cancer are at high risk of developing malnutrition, the majority should be automatically referred, where services are available, for

| Table 1 Characteristics of patients with head and neck cancer associated with greater likelihood of severe weight loss and/or need for alternative feeding methods. |

| Diagnosis | pharyngeal/hypopharyngeal primary<sup>23</sup> base of tongue tumours<sup>30</sup> nasopharyngeal tumours<sup>35</sup> T4 tumours<sup>2,38,39</sup> moderately or poorly differentiated cancer<sup>39</sup> |
| Treatment | excision of base of tongue or pharynx<sup>39</sup> mandibulectomy<sup>39</sup> reconstruction with a pectoralis major flap<sup>39</sup> chemo-radiation<sup>2,30,40</sup> post-operative radiotherapy<sup>30,39</sup> |
| Weight loss | pre-treatment weight loss > 7% body mass index<sup>30</sup> pre-operative weight loss > 10lbs (5kg) <sup>38</sup> |
Nutritional status in oncology patients. The Malnutrition Screening Tool (MST) is a quick and simple tool based on recent appetite and weight loss, demonstrated to be a valid and reliable predictor of nutritional status in oncology patients. The MST can be included on admission forms and can be completed by the patient, administration, nursing staff or nutrition assistants. Patients identified as at high risk should be referred for full nutrition assessment. Patients initially screened as at low risk should be re-screened every two weeks or when next attending an outpatient appointment.

Body weight is the simplest indicator of change in nutritional status and head and neck cancer patients should be weighed routinely. A more thorough nutrition assessment is required, however, to determine changes in body composition. Loss of fat-free mass is mainly responsible for the reduced functional status and increased mortality associated with malnutrition. Body fat often masks loss of lean tissue and hence patients who fall within ‘healthy’ or overweight categories are often overlooked despite significant amounts of unintentional weight loss.

Table 2
Key points in the nutrition care of head and neck cancer patients.

- Monitor weight regularly.
- Aim for weight maintenance during treatment.
- Implement routine nutrition screening.
- Refer high risk patients for nutrition and swallowing assessment.
- Manage nutrition-related symptoms as a multidisciplinary team.

Nutrition assessment provides a comprehensive and in-depth assessment of medical and nutritional histories, a physical examination and/or biochemical measurements to determine an individual’s nutritional status. The scored Patient Generated-Subjective Global Assessment (PG-SGA) is a valid and reliable tool for assessing the nutritional status of patients with cancer. The PG-SGA can be used in nutritional triage to determine the level of nutrition support required and also as an outcome measure to assess the impact of nutrition intervention. Table 2 summarises key elements in the attainment of improved nutrition outcomes.

Early and intensive nutrition management

Multidisciplinary clinics provide an opportunity to identify dysphagia and nutritional risk during the pre-treatment phase. Where complex treatment regimens are planned and the patient is at high risk of malnutrition, speech pathology and dietetic intervention should commence prior to or in the first week of treatment.

Initial dietary advice for malnourished patients includes ways to increase protein and energy intake and advice on texture modification if there are chewing or swallowing difficulties. Relaxation of any previous dietary restriction is often appropriate, especially as goals of treatment change with advancing disease. Many patients will require oral nutrition supplements to reach their nutrient requirements. The dietitian can prescribe the most appropriate supplement, advising the patient on any subsidised supplies for which they may be eligible. Monitoring is an essential component to achieve positive outcomes as adherence to the original prescription can become difficult due to taste fatigue or changing side-effects of treatment.

In the early post-operative phase, routine and regular review by surgeon, nursing staff, dietitian and speech pathologist is important to ensure the most efficient return to oral intake without compromising nutritional status. At this time, patients often require oral or alternative supplemental feeding while they complete swallowing rehabilitation programs.

Multidisciplinary care is also imperative during post-operative radiotherapy or chemo-radiotherapy to manage side-effects that may limit food intake. Co-locating dietetic and speech pathology reviews with weekly progress evaluations by the radiation oncologist and nursing staff improves team communication, allowing efficient identification and resolution of symptoms. Transdisciplinary intervention should continue well into the post-treatment phase until symptoms subside, patients return to oral intake and can maintain suitable weight. The use of objective assessments including fibre optic endoscopic evaluation of swallowing and modified barium swallow assessments guide clinicians in developing swallowing rehabilitation programs. These patients are concurrently dealing with issues related to cancer survivorship. Supportive care should be available following the completion of treatment to promote QoL and facilitate any adaptation that may be needed due to long-term effects of treatment or disease.

Future directions

Well designed prospective studies are needed to clearly identify which head and neck cancer patients would benefit from prophylactic gastrostomy placement and to determine optimal perioperative nutrition support. Future research evaluating the impact of nutrition intervention in patients with head and neck cancer needs to include a longer follow-up, mortality data, an analysis of health service utilisation and an assessment of cost versus benefit.

Evidence-based practice guidelines for the nutritional management of cancer cachexia have been endorsed by the Dietitians Association of Australia (DAA). Evidence-based practice guidelines for the nutritional management of patients receiving radiotherapy are
currently being developed. Recently, local branches have merged to form the national DAA oncology interest group, which will help streamline the development of nutrition pathways. We also hope a multidisciplinary nutrition group will be formed within the Clinical Oncological Society of Australia.

Summary
Malnutrition occurs frequently in head and neck cancer and may be overlooked in patients who do not look “underweight” despite significant weight loss. Nutrition screening should be conducted on all patients and those identified as high nutritional risk referred to the dietitian and speech pathologist. The existing paradigm is that malnutrition in patients with cancer is often inevitable. Early and intensive nutrition intervention, however, has been shown to prevent or minimise nutritional deficits. Nutritional oncology is a new discipline and requires, as do other oncologic disciplines, use of standardised intervention protocols. As current improvements in the multimodality therapy of head and neck cancer continue it is vital that nutritional oncology keeps pace for best patient care.

References