



THE ROLE OF NUTRITIONAL COUNSELLING AND ORAL NUTRITIONAL SUPPLEMENTS IN THE PREVENTION AND TREATMENT OF MALNUTRITION IN HEAD AND NECK CANCER PATIENTS UNDERGOING RADIOTHERAPY.

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ABSTRACT

INTRODUCTION: Cancer cachexia increases morbidity and mortality among patients. Proper nutritional counselling and supplements may improve the quality of life.

AIM: The aim of the study is to determine the effect of dietary counselling and oral supplements on weight loss in patients with head and neck cancer undergoing radiotherapy.

MATERIAL AND METHOD: This is hospital based prospective observational study on 60 patients of head and neck cancer undergoing radiotherapy with or without chemotherapy. Data were recorded regarding weight, height, PG-SGA score, form of nutrition support and haematological investigations.

RESULT: The mean age of the sample was 47.35 years (23-70 years). 38.3% of the patients assessed with the PG-SGA were considered well-nourished and 61.6% were moderately malnourished.

CONCLUSION: Early and intensive individualised dietary counselling by a dietitian produces clinically relevant effects in terms of decreasing weight loss and malnutrition in patients with head and neck cancer undergoing radiotherapy.

KEYWORDS : Head and Neck Cancer, Radiotherapy, Dietary counselling, Nutritional supplement, Wasting, Quality of life

INTRODUCTION: Malnutrition is a major cause of morbidity and mortality in cancer patients. The cause of malnutrition at diagnosis amongst head and neck cancer patients is considered multifactorial and includes both lifestyle factors such as smoking and chewing tobacco and heavy alcohol use and tumour factors. [1] Radiotherapy is the mainstay of treatment for head and neck cancer. During radiation treatment patients may experience dysphagia, odynophagia, mucositis, xerostomia, dysgeusia, loss of appetite and fatigue. Concurrent chemoradiotherapy is associated with increased frequency of this acute side effects. [2] These factors lead to unplanned treatment breaks that may lead to decreased efficacy of treatment and thus poorer patient outcomes and increased morbidity and mortality. [3] Nutrition intervention is reported to positively influence patient outcomes and quality of life. [4] We aimed to determine the effect of dietary counselling and oral supplements on weight loss in patients with head and neck cancer undergoing radiotherapy.

MATERIAL AND METHOD

The study was conducted on 60 patients of Head and Neck Cancer presented at Department of Radiotherapy, Gandhi Medical College between May 2015 and December 2016. All patients receiving radiotherapy to the head and neck region at this facility are assessed by a dietitian and radiation oncologist, and nutrition and diet therapy record is kept for each patient. Data were recorded regarding weight, height, PG-SGA score, form of nutrition support and haematological investigations as part of standard practice.

Inclusion criteria:

- Diagnosis of Head and Neck Cancer with Squamous cell carcinoma histology;
- Karnofsky performance score ≥ 70 .
- Age >18 and <70 years
- Completion of radiotherapy as all or part of curative intent treatment.

Exclusion criteria:

- Age ≥ 70 years.
- Presentation with distant metastasis.
- Prior head and neck irradiation/surgery.
- Histology other than SCC.

The scored PG-SGA includes questions relating to dietary intake, the presence of nutrition impact symptoms and recent weight loss. The medical history and physical examination components of the assessment were completed by treating radiation oncologist. A score was awarded based on the impact that symptom has on nutritional status. The score was intended to guide the level of nutritional support that the patient needs. A global rating of well nourished, moderately malnourished and severely Malnourished was also assigned based on the patients' responses.

Body Mass Index (BMI) was calculated and classified according to the World Health Organisation (WHO) criteria. [5,6] Percentage weight loss was calculated as weight (end radiotherapy)/weight (baseline) $\times 100$. Weight maintenance was classified as $<5\%$ weight loss from baseline.

Radiotherapy Protocol: Patients were treated on Cobalt-60 Theratron 780 machine. A total dose of 7000 centigray (cGy)/35 fraction @ 200 cGy/ fraction /day, five days a week over 7 weeks were prescribed. Concurrent Cisplatin 40mg/m² was administered every fifth day of radiation therapy.

Statistical Analysis: Data was analysed using SPSS version 16. Descriptive statistics were performed to determine the mean and standard deviation for demographic data. The level of statistical significance was set at a p-value of 0.05. Group means were compared by independent t-tests and the Chi-squared test of association.

RESULTS: The mean age of the sample was 47.35 years (23-70 years).

Table 1: Basic Patient Characteristics

	MEAN	SD
AGE (years)	47.35	± 23.5
WEIGHT (kg)	56.6	± 18.4
BMI (kg/m ²)	25.2	± 3.2
	n=60	%
<18.5	5	8.3
18.5-24.9	32	53.3
25-29.9	20	33.3
>30	3	5.0
PG-SGA GLOBAL RATING	n=60	%

A:WELL NURISHED	23	38.3
B:MODERATEDLY MALNURISHED	37	61.6
C:SEVERELY MANURISHED	0	0
TUMOUR SITE	n=60	%
ORAL CAVITY	34	56.6
OROPHARYNX	26	43.3
TREATMENT MODALITY	n=60	%
RADIATION	1	1.6
CHEMORADIATION	5	8.3
INDUCTION CHEMO+RADIATION	54	90

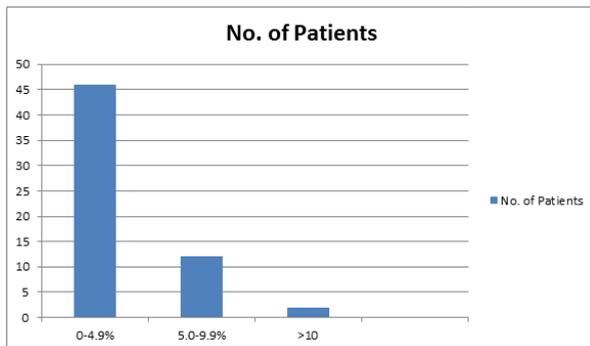


Figure 1: Degree of weight loss from commencement of radiotherapy

The majority of the subjects selected for this sample were males ($n = 44$). The mean BMI was $25.2\text{kg}/\text{m}^2$ ($\text{SD} \pm 3.2$) ($n=60$). A height measurement is required for the calculation of BMI. Five patients (8.3%) were considered underweight (BMI < 18.5) at initial presentation. All subjects were assessed using the PG-SGA.

38.3% of the patients assessed with the PG-SGA were considered well-nourished and 61.6% were moderately malnourished. No patient received a PG-SGA global rating of severely malnourished.

On average, subjects lost 3.2kg ($\pm 2.2\%$) of their body weight during radiation treatment. Figure 1 summarises the degree of weight loss in patients receiving radiotherapy. Only two patients had weight loss of $>10\%$ body weight during the course of their radiation treatment.

DISCUSSION: Malnutrition is commonly seen amongst cancer patients and its complications more adversely affect the head and neck cancer patients than others due to additional nutritional deprivation. The incidence of malnutrition at diagnosis is estimated to be 30–50% of all patients.[7]

Weight loss is common in patients undergoing radiotherapy for head and neck cancer. It is also a critical factor for these patients as significant weight loss contributes to increased morbidity and mortality.[8–10] Significant weight loss also correlates with treatment interruptions, infections and hospital readmission rates.[11] In head and neck cancer patients, malnutrition, specified as unintended weight loss $\geq 5\%$ in 1 month and/or $\geq 10\%$ in 6 months, has been reported in 30–50%, particularly in those with squamous cell carcinomas in the oropharyngeal and hypopharyngeal areas[12,13] More specifically, unintended weight loss was found to be associated with a higher rate of recurrence and second primary tumours of the oral cavity and oropharynx after radiotherapy.[14]

This study has demonstrated a lower prevalence of malnutrition at presentation compared with previous studies.[7,11,15] This could reflect the exclusion of patients for palliative treatment in this study which is similar to the observation of Jeffery E et al. [16] Palliative patients tend to have more advanced disease and therefore are more likely to have poorer nutritional status due to the size and location of the tumour or from cancer cachexia/anorexia syndrome. One study reported that 56% of malnourished patients in their

sample were suffering from advanced stage of disease which was very less as compared to that of ours as at our clinical setup majority of the patients presents with locally advanced disease.[17] At the time of diagnosis, critical weight loss has been more frequently observed in patients with cancer of the hypopharynx, oropharynx oral cavity, or supraglottic larynx which supports the findings of our study.[15,16] There were a prevalence of malnutrition among our patients which could be explained by their low socioeconomic status and illiteracy. However this finding differ from that of Jeffery E et al who found lower prevalence of malnutrition at initial presentation in their sample of head and neck cancer patients as 61.7% of patients classified as overweight or obese.[16] This also has an impact on how much weight has to be lost before 5% loss is achieved.

A high percentage of patients in our study experienced mild weight loss ($<5\text{kg}$ body weight) during their radiation treatment which differ from the findings of other studies. [8,16] One study reported that pre-treatment determinations of nutritional status or dietary habits and anthropometric measurements were not predictive of weight loss during radiotherapy.[18] Studies have found that sex, tumour site and stage influenced critical weight loss during treatment which is in accordance with our study.[19]

Capuano et al reported on the results of their nutritional programme designed for patients to achieve and maintain their calculated energy and protein requirements.[11] They observed that all non-compliant patients continued to lose weight, whilst compliant patients did not lose significant amounts of weight. This finding is in accordance to that of our study. In practice, patients may find it difficult to be compliant if they have multiple nutrition impact symptoms.[20]

The use of chemotherapy is a common treatment modality in patients who have more advanced tumour stages. Side-effects of chemotherapy also increase the incidence of nausea/vomiting and myelosuppression thereby increases the morbidity and mortality of patients. The literature also supports tube feeding via nasogastric tube or percutaneous endoscopic gastrostomy (PEG) as a means of minimising loss of weight in patients with locally advanced head and neck cancers receiving accelerated fractionation and concurrent chemoradiotherapy.[8]

CONCLUSION

This study has identified that increasing age, advanced stage disease and the addition of chemotherapy are risk factors for weight loss during radiation treatment. Pre-treatment nutritional status did not influence weight loss during treatment in this study. Therefore, this study highlights the need for early identification and intensive dietetic intervention for patients to prevent weight loss thereby improving Quality of life(QoL).

REFERENCES:

- [1] Lees J. Incidence of weight loss in head and neck cancer patients on commencing radiotherapy treatment at a regional oncology centre. *Eur J Cancer Care*. 1999;8:133-6.
- [2] Seiwert T, Cohen E. State-of-the-art management of locally advanced head and neck cancer. *Br J Nurs*. 2005;92:1341-8.
- [3] Rosenthal D. Consequences of mucositis-induced treatment breaks and dose reductions on head and neck cancer treatment outcomes. *J Support Oncol*. 2007;5(9 suppl 4):23-31.
- [4] Isenring E, Capra, S, Bauer, J. Nutrition intervention is beneficial in oncology patients receiving radiotherapy to the gastrointestinal or head and neck area. *Br J Cancer*. 2004;91:447-52.
- [5] WHO. Physical status: the use and interpretation of anthropometry. Report of a WHO Expert Consultation. WHO Technical Report Series Number 854. Geneva: World Health Organization; 1995.
- [6] WHO. Obesity: preventing and managing the global epidemic. Report on a WHO Consultation on Obesity, Geneva, 3–5 June, 1997. WHO/NUT/NCD/98.1. Technical Report Series Number 894. Geneva: World Health Organization; 2000
- [7] Lee H, Havrila, C, Bravo, V, Shantz, K, Diaz, K, Lerner, J, Read, P. Effect of oral nutritional supplementation on weight loss and percutaneous endoscopic gastrostomy tube rates in patients treated with radiotherapy for oropharyngeal carcinoma. *Support Care Cancer*. 2008;16:285-9
- [8] Beaver M, Matheny, K, Roberts, D, Myers, J. Predictors of weight loss during radiation therapy. *Otolaryngol Head Neck Surg*. 2001;125:645-8.
- [9] Larsson M, Hedelin, B, Athlin, E. Lived experiences of eating problems for patients with head and neck cancer during radiotherapy. *J Clin Nurs*. 2003;12:562-70

- [10] Van den Berg M, Rasmussen-Conrad E, Van Nispen L, Van Binsbergen J, Merkx M. A prospective study on malnutrition and quality of life in patients with head and neck cancer. *Oral Oncol.* 2008(44):830-7.
- [11] Capuano G, Grosso A, Gentile P, Battista M, Bianciardi F, Di Palma A, Pavesi I, Satta F, Tosti M, Palladino A, Coiro G, Di Palma M. Influence of weight loss on outcomes in patients with head and neck cancer undergoing concomitant chemoradiotherapy. *Head Neck.* 2008;30:503-8.
- [12] van den Berg MG, Rasmussen-Conrad EL, Gwasara GM, et al. A prospective study on weight loss and energy intake in patients with head and neck cancer, during diagnosis, treatment and revalidation. *Clin Nutr* (2006)25,765–772.
- [13] van Bokhorst-de van der Schueren MA, van Leeuwen PA, Sauerwein HP, et al. Assessment of malnutrition parameters in head and neck cancer and their relation to postoperative complications. *Head Neck* (1997) 19, 419–425
- [14] Nguyen TV & Yueh B. Weight loss predicts mortality after recurrent oral cavity and oropharyngeal carcinomas. *Cancer* 95, 553–562.
- [15] Jager-Wittenaar H, Dijkstra P, Vissink A, van der Laan B, van Oort R, Roodenburg J. Critical weight loss in head and neck cancer—prevalence and risk factors at diagnosis: an explorative study. *Support Care Cancer.* 2007;15:1045-50.
- [16] Jeffery E, Sherriff J and Langdon C. A clinical audit of the nutritional status and need for nutritional support amongst head and neck patients treated with radiotherapy. *Aus Med Journ[AMJ]* 2012,5,1,8-13
- [17] Ravasco P, Monteiro-Grillo, I, Marques, P, Camilo, M. Impact of nutrition on outcome: a prospective randomized controlled trial in patients with head and neck cancer undergoing radiotherapy. *Head Neck.* 2005;27:659-68.
- [18] Johnston C, Keane T, Prudo S. Weight loss in patients receiving radical radiation therapy for head and neck cancer: a prospective study. *J Parenter Enteral Nutr.* 1982;6:399-402
- [19] Nourissat A, Bairati I, Samson E, Fortin A, Gélinas M, Nabid A, Brochet F, Tetu B, Meyer F. Predictors of weight loss during radiotherapy in patients with stage I or II head and neck cancer. *Cancer.* 2010;116(9):2275-83.
- [20] Sonis S, Elting L, Keefe D. Perspectives on cancer therapy-induced mucosal injury pathogenesis, measurement, epidemiology, and consequences for patients. *Cancer.* 2004;100:1995-2225.