

Effectiveness of Nutritional Counseling in Improving the Nutritional Status of Head and Neck Cancer Patients undergoing Concurrent Chemotherapy and Radiotherapy through continuous Guidance on Nutrition

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Abstract

Original Research Article

Background: Though nutrition plays a vital role during all phases of cancer treatment, in patients suffering from head and neck cancer, it is particularly important. Studies have reported the malnutrition prevalence rate of head-neck cancer patients as high as 74.2%. Studies have shown that early intervention and counselling by a dietician; with proper evaluation and guidance for nutritional management is of paramount importance in improving the nutritional status of patients in head and neck cancer. **Materials and Methodology:** A retrospective data from 1st October 2018 to 31st March 2019 for 50 head and neck cancer patients on concurrent chemotherapy and radiotherapy before initiation of the dietary counseling initiative henceforth referred as Non Counseling Group (NCG) was compared with retrospective data from 1st May 2019 to 30th October 2019 of 50 head and neck cancer patients on concurrent chemotherapy and radiotherapy who received the diet counselling services henceforth referred as Regular Counseling Group (RCG). **Results:** On the first day of therapy Nutritional Status of Regular Counselling Group (RCG) and Non Counselling Group (NCG) subjects were Well Nourished 10 (20%) and 10 (20%) respectively; Moderately malnourished 27 (54%) and 23(46%) respectively; Severely malnourished 13 (26%) and 17 (34%) respectively. On the other hand on last day of therapy Nutritional Status of RCG and NCG subjects were Well nourished 20 (40%) and 4 (8%) respectively; Moderately malnourished 27 (54%) and 19 (38%) respectively; Severely malnourished 3 (6%) and 27(54%) respectively. Analytical data as per comparison revealed that nutritional status of RCG subjects are better than NCG subjects. **Discussion:** The present study showed that the nutritional status of the patients gradually declined during the treatment with peak decline by 3rd week. As a result of dietary counseling, changes in mode of diet delivery, further deterioration was prevented leading to better nutritional intake. Patient assessment and dietary counselling with as recommended continued in subsequent sessions. On the third week 16(32%) patients consumed adequate calories and 26(52%) patients consumed optimum protein. Adequate calorie intake was recorded in 18(36%), 17(34%) patients and protein intake in 28(56%), 29(58%) patients in the 4th and 5th week. The data revealed that the patients were motivated and benefited by the continuous counseling by the dietician as the complaint of fatigue did not further increase after 5th and 6th week which is very commonly seen in such patients on therapy. **Conclusion:** This study demonstrated that Nutritional counseling, starting of tube feed at an appropriate time and oral nutritional supplements should be used to increase dietary intake and to prevent therapy-associated weight loss and interruption of therapy.

Keywords: Head and Neck cancer, Diet counseling, Nutrition.

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INTRODUCTION

Head and neck cancer is the sixth leading cancer by incidence worldwide and the eighth by mortality [1]. Patients with cancer are more prone to

malnutrition which when untreated can lead to serious consequences [2]. Though nutrition plays a vital role during all phases of cancer treatment, in patients suffering from head and neck cancer, it is particularly important [3].

It is estimated that 30-50% of the patients suffering from head and neck cancer are malnourished even before the treatment begins [4]. Patients who are not malnourished at the time of diagnosis also remain highly susceptible to malnutrition. Studies have reported the malnutrition prevalence rate of head-neck cancer patients as high as 74.2% [5].

This is not only due to cancer cachexia that causes hypercatabolism due to the systemic inflammatory response with increased production of pro-inflammatory cytokines, reactive oxygen species and catabolic mediators produced by tumor and host cells but also decreased food intake due to mouth ulceration, mucositis, toxicities of radiotherapy, swallowing difficulties and taste alteration which play a significant role in making the head and neck cancer patients more prone to malnutrition [6]. Moreover, the multimodal treatment for head and neck cancer that includes surgery, chemotherapy or radiotherapy also create challenge for the patients [7].

Malnutrition in such patients not only impedes treatment by decreasing response to treatment, causes treatment interruptions, makes the patients more prone to the complications of treatment but is also inversely related to the prognosis and has a worsening effect on the quality of life, with an increase of morbidity and mortality [8].

Studies have shown that early intervention and counselling by a dietician; with proper evaluation and guidance for nutritional management is of paramount importance is improving the nutritional status of patients in head and neck cancer. This has not only helped to better fit the antitumor treatment but improve the quality of life for the patients [9]. Nutrition management for head and neck cancer patients improves clinical outcome and survival also [10, 11]. Research has shown that identification of nutrition problems and treatment of symptoms stabilized or reversed weight loss in 50% to 88% of patients with cancer [12].

Similar studies in Indian settings are sparse. The study was carried out with the objectives to address malnutrition of outpatients with head and neck cancer on concurrent chemotherapy and radiotherapy and to see the effectiveness of dietary counseling in maintaining optimum nutrition in such patients. Our aim was to target the patients on concurrent chemotherapy coming into the Radiotherapy unit for treatment for head and neck cancer and examine the nutrition related challenges faced by these patients, as well as plan out nutrition strategies that may help patients overcome these challenges and maintain good nutritional status.

MATERIALS AND METHODOLOGY

A retrospective data from 1st October 2018 to 31st March 2019 for 50 head and neck cancer patients on concurrent chemotherapy and radiotherapy before initiation of the dietary counseling initiative henceforth referred as Non Counseling Group (NCG) was compared with retrospective data from 1st May 2019 30th October 2019 of 50 head and neck cancer patients on concurrent chemotherapy and radiotherapy who received the diet counselling services henceforth referred as Regular Counseling Group (RCG). Patients suffering from critical illness, acute renal failure and/or diabetes mellitus were excluded from the study. The two groups were matched for the diagnosis and disease stage.

Data for the study was collected through pre-structured forms, entered in the Microsoft excel 2013 and analyzed using descriptive statistics.

We used Patient Journey Flow Mapping Exercise to improve upon the nutritional status of head and neck cancer patients undergoing concurrent chemo and radiotherapy.

Patient journey mapping is an exercise that healthcare professionals use to better understand what individuals experience throughout the entire patient journey. The patient journey map outlines all of the patient touch points during each stage of the care journey and aids in creating strategic outreach that improves both patient engagement and satisfaction. Ultimately, patient journey maps help improve patient engagement and foster lasting patient-provider relationships.

A patient coming for radiotherapy had to go through the following processes like assessment of the patient; decision to treat; prescribing treatment protocols; positioning and immobilization of the patient; simulation, imaging and volume determination followed by planning for radiotherapy; treatment information transfer followed by patient setup. After this the actual process of treatment delivery (Radiotherapy) commences. The flow ends with treatment verification and monitoring.

A patient had to wait on an average 30 minutes for their his/her turn before every sitting. This could not be reduced further despite providing the appointment schedule. While patients were waiting for their radiotherapy sittings, they were referred by the Consultant Radiation Oncology to the dietician for counselling. The Radiation oncology department coordinator guides the patients to the Dietician and coordinates the process. This had a dual benefit of keeping the patients engaged while awaiting their Radiotherapy sittings and also helped the patients in improving the nutritional status through nutritional counselling.

Nutritional intake was derived from a diet history to assess changes in current intake during therapy. A 24-hour-recall food questionnaire was used to assess the nutrient intake.

Subjective Global assessment (SGA) was used as an assessment tool.

The flow of patients for the Dietetic services is depicted in Figure 1.

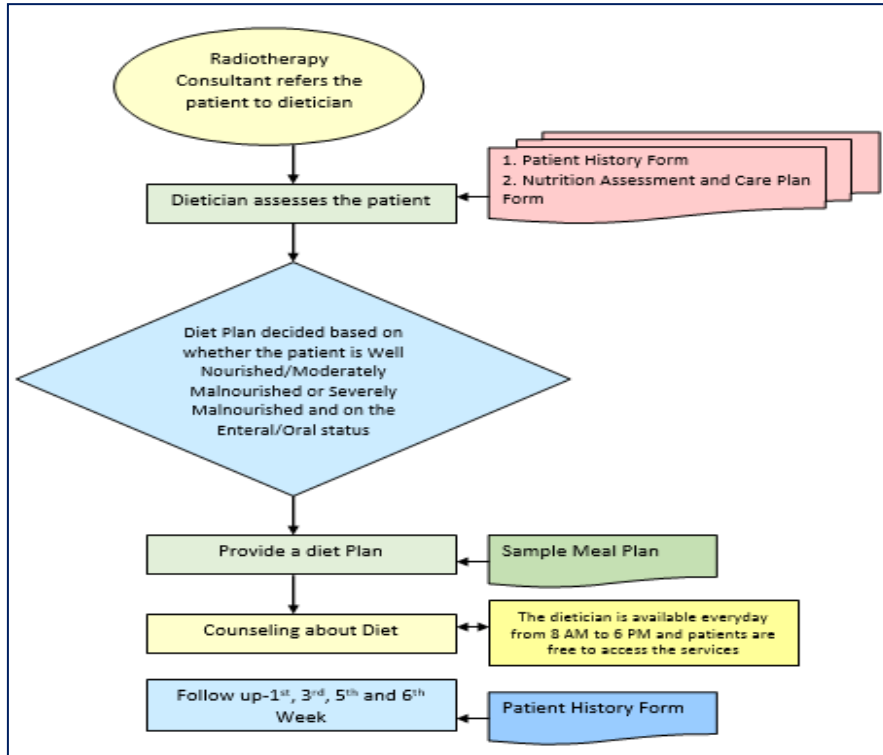


Fig-1: Patient flow for availing the Nutritional services

Regular nutritional counselling was provided to patient during treatment in accordance with their individual requirements based on the extent of their malnutrition, the prognosis and stage of their illness, and the side effects of treatment. Individually intended sample meal plans, recipe advices, and suggestions in order to minimize the side effects of the tumour and therapy such as mucositis, nausea, or vomiting were provided. Oral hyper-caloric nutritional supplements and protein supplements were also provided.

Dietary counselling was provided by the same dietitian before, in the middle of, and at the end of Radiotherapy with approximately two week intervals.

Nutritional intake was derived from a diet history to assess changes in current intake during therapy. If symptoms such as dysphagia, swallowing difficulties, appetite loss, nausea, taste problems, or xerostomia developed, the individualized dietary modification was implemented to meet patients' needs.

Quality of life was assessed through the symptom of fatigue, nausea or vomiting, Taste alteration, mucositis, and gastrointestinal symptoms. Nutrition intervention was documented for analysis and outcome.

RESULTS

Demographic details of the patient population

Data for a total of 100 Head and Neck Cancer patients on concurrent chemotherapy and radiotherapy were analyzed. 50 patients (NCG) did not receive any diet counseling services while 50 patients received diet counseling services (RCG). The average age of the patients was 54 years and the range was from 30 years to 84 years. 80% (80 patients) of the patients were females while remaining 20% (20 patients) were males. 64% of the patients had food preferences as non-vegetarians while remaining 36% had food preferences as vegetarians.

Among 80 female patients, 80% had comorbidities while remaining 20% were without comorbidities. Among 20 male patients, 65% had comorbidities while remaining 35% did not have any comorbidity. The comorbidities mostly included Hypertension, Hypothyroidism, Dyslipidemia and Chronic Obstructive Airway Disease.

Among the 50 patients in Regular Counseled Group (RCG), on the 1st Day of visit to the Dietician 47 patients (94%) were on oral feed while only 3 patients (6%) were on tube feed; on the 2nd day of visit, 44 patients (88%) were on oral feed while 6 patients

(12%) were on tube feed; on the 3rd day of visit 39 patients (78%) were on oral feed while 11 patients (22%) were on tube feed; on the 4th day of the visit, 29 patients (58%) were on oral feed while 21 patients (42%) were on tube feed and on the 5th day of the visit, 27 patients (54%) were on oral feed while 23 patients (46%) were on tube feed. Nutrition delivery route is depicted in Table 1.

After 1st week of starting Radiotherapy, 30% of patients complained of fatigue, after 3rd week of radiotherapy 50% of patients complained of fatigue, after 5th week of radiotherapy 44% of patients complained of fatigue while after 6th week of radiotherapy 38% of patients complained of fatigue.

Energy and Protein Intake from 24 hours of diet recall is depicted in Table 2.

Comparison of BMI status at the start and end of the Diet Counselling Sessions is depicted in Figure 2.

On the first day of therapy Nutritional Status of Regular Counselling Group (RCG) and Non Counselling Group (NCG) subjects were Well Nourished 10 (20%) and 10 (20%) respectively; Moderately malnourished 27 (54%) and 23(46%) respectively; Severely malnourished 13 (26%) and 17 (34%) respectively. On the other hand on last day of therapy Nutritional Status of RCG and NCG subjects were Well nourished 20 (40%) and 4 (8%) respectively; Moderately malnourished 27 (54%) and 19 (38%) respectively; Severely malnourished 3 (6%) and 27(54%) respectively. Analytical data as per comparison revealed that nutritional status of RCG subjects is better than NCG subjects. This has been depicted in Table 3.

As depicted in Table 4, all the patients who did not have a personalized diet counselling had weight loss. The weight loss trend was much less in the group with diet counseling. Severe weight loss of > 4 kilograms was observed in the non-counselled group which was much less in the regular counselling group.

Table 5 depicts the differentiation of Adequate Calorie and Protein intake between Regular Counselling Group and Non Counselling Group at the first day of therapy and the last day of therapy. Nutritional intake of Regular Counselling patients was higher than Non Counselling Patients.

DISCUSSION

We started dietary counseling from 1st May 2018 to the head and neck cancer patients who received concurrent chemotherapy and radiotherapy. Among the 50 patients whose data was analyzed, 45(90%) patients came for dietary counseling till the end of the therapy and 5(10%) patients discontinued due to some unavoidable circumstances.

The present study showed that the nutritional status of the patients gradually declined during the treatment with peak decline by 3rd week. As a result of dietary counseling, changes in mode of diet delivery, further deterioration was prevented leading to better nutritional intake.

There were no significant differences in baseline characteristics (BMI, nutritional status) before the treatment. But there were significant changes in nutrition delivery route. On first day of visit, patients taking food orally was 47(94%) and the number of patients on tube feed was only 3(6%).

After 2nd week of radiation, radiation related mucositis, taste alteration and swallowing difficulties gradually increased from moderate to severe. Hence to bridge the gap of nutrition requirement and nutrition intake, changes were made in the route of nutrition delivery after 3rd week. Patients taking food orally only came down to 39 (78%) and the number of patients on tube feeds increased to 11(22%).

Dietary intake of patients only on oral diet was low on diet recall though the patients were also prescribed oral nutrition supplements. By the end of 4th and 5th visit patients only taking food orally was 29(58%), and 27(54%) and that on tube feed was 21(42%), 23(46%) respectively.

On the third week 16(32%) patients consumed adequate calories and 26(52%) patients consumed optimum protein. As a result of diet counseling and change in the nutrition delivery, calorie and protein intake increased during the 4th visit, and 5th visit. Adequate calorie intake was recorded in 18(36%), 17(34%) patients and protein intake in 28(56%), 29(58%) patients in the 4th and 5th week.

The data revealed that the patients were motivated and benefited by the continuous counseling by the dietician as the complaint of fatigue did not further increase after 5th and 6th week which is very commonly seen in such patients on therapy.

CONCLUSION

This study demonstrated that Nutritional counseling, starting of tube feed at an appropriate time and oral nutritional supplements should be used to increase dietary intake and to prevent therapy-associated weight loss and interruption of therapy.

There were no significant differences in baseline characteristics (BMI, nutritional status) before the treatment. But there were significant changes in nutrition delivery route.

If obstructing cancer and/or mucositis interfere with swallowing, enteral nutrition other than oral

nutrition like Ryles tube feed and PEG should be the choice of nutrition delivery.

The present study showed that the nutritional status of the patients gradually declined during the treatment with peak decline by 3rd week. As a result of dietary counseling, changes in mode of diet delivery, further deterioration was prevented leading to better nutritional intake.

Nutrition intervention of head and neck cancer patients could lead to lower amount of weight loss, better quality of life and shorter recovery duration. So timely nutritional intervention is of utmost importance to help the patients to keep nourished.

Further prospective studies are required to describe the nutrition related challenges faced by patients suffering from head and neck cancer and the effectiveness of nutritional counseling in improving the nutritional status in these patients, as well as plan out nutrition strategies that may help patients overcome these challenges and maintain good nutritional status.

LIMITATIONS OF THE STUDY

Our data did not include the in-patients admitted in the hospital suffering from head and neck cancer and

We could target only 60% of the patients with head and neck cancer as dietician consultation and counseling was not given due importance by the patients/relatives and many of them had to be called up telephonically for consultation/follow up.

Conflict of Interest

The authors declare there is no conflict of interest.

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Table-1: Nutrition delivery route as per day of visit in Regular Counseled Group

Day	Oral	Tube feed
1st day of visit	57(94%)	3(6%)
2nd day of visit	44(88%)	6(12%)
3rd day of visit	38(78%)	11(22%)
4th day of visit	29(58%)	21(42%)
5th day of visit	27(54%)	23(46%)

Table-2: Energy and Protein Intake from 24 hours of diet recall in Regular Counseled Group

Day	Calorie intake		Protein intake	
	Adequate	Low	Adequate	Low
24 hours diet recall on 1st day of visit	9(18%)	41(82%)	3(6%)	47(94%)
24 hours diet recall on 2nd day of visit	33(66%)	17(34%)	43(86%)	7(14%)
24 hours diet recall on 3rd day of visit	16(32%)	34(68%)	26(52%)	24(48%)
24 hours diet recall on 4th day of visit	18(36%)	32(64%)	28(56%)	22(44%)
24 hours diet recall on 5th day of visit	17(34%)	33(66%)	29(58%)	31(62%)

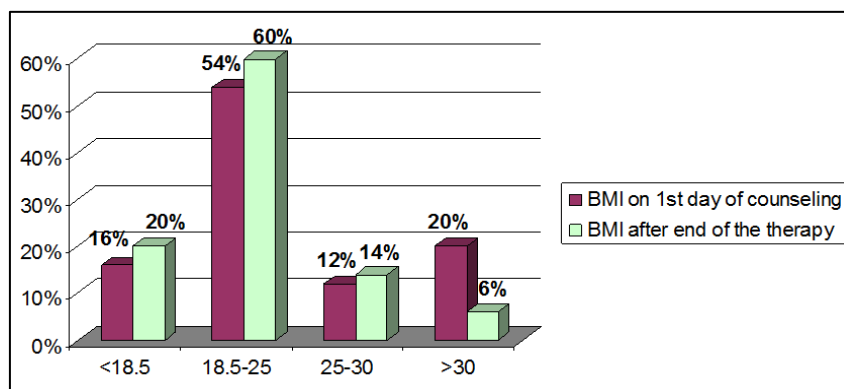


Fig-2: BMI Comparison at the start and End of the Diet Counseling Sessions

Table-3: Nutritional status comparison between RCG (Regular Counseling Group) and NCG (Non Counseling Group) as per Subjective Global Assessment (SGA)

1st Day of Radiotherapy				Last Day of Radiotherapy			
Patient category	Well nourished	Moderately malnourished	Severely malnourished	Patient category	Well nourished	Moderately malnourished	Severely malnourished
RCG-50 patients	10(20%)	27(54%)	13(26%)	RCG-50 patients	20(40%) ↑	27(54%)	3(6%) ↑
NCG-50 patients	10(20%)	23(46%)	17(34%)	NCG-50 patients	4(8%) ↓	19(38%)	27(54%) ↓

Table-4: Total weight loss comparison between Regular Counselling Group and Non Counselling Group

Weight loss	Regular Counselling Group	Weight loss	Non Counselling Group
No weight loss	7(14%)	No weight loss	50 (100%)
1-2 kg weight loss	18(36%)	1-2 kg weight loss	4 (8%)
2-4 kg weight loss	11(22%)	2-4 kg weight loss	6(12%)
4-6 kg weight loss	7(14%)	4-6 kg weight loss	21(42%)
>6 kg weight loss	7(14%)	>6 kg weight loss	19(38%)

Table-5: Differentiation of Adequate Calorie and Protein Intake between Regular Counselling Group and Non Counselling Group

Day	Regular Counselling Group				Day	Non counselling Group			
	Adequate calorie intake	Adequate protein intake	Low calorie intake	Low protein intake		Adequate calorie intake	Adequate protein intake	Low calorie intake	Low protein intake
1st day of therapy	9(18%)	3(6%)	41(82%)	47(94%)	1st day of therapy	31(62%)	25(50%)	19(38%)	25(50%)
Last day of therapy	17(34%) ↑	29(58%) ↑	33(66%) ↑	31(62%) ↑	Last day of therapy	3(6%) ↓	9(18%) ↓	38(76%) ↓	41(82%) ↓

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