Research Article

Nutritional Status Assessment of Selected Male Cancer Patients In Cochin, Kerala

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ABSTRACT

The study was conducted for the assessment of nutritional, functional status and, Quality of Life (QoL) of selected male cancer patients undergoing cancer therapy. A purposive sampling method was adopted and an interview schedule was used to elicit data. The nutritional status assessment was conducted by incorporating modified Subjective Global Assessment (SGA), QoL, and functional status of the patients. The findings suggested that head and neck cancer was the leading type of cancer followed by lung, stomach and oesophagus cancer and a vast majority of patients were in the terminal stages of cancer. The Subjective Global Assessment (SGA) revealed that majority of the patients belonged to mildly-moderately nourished category. Majority study subjects had an inadequate nutrient intake with respect to energy, protein, fat, calcium and iron. A statistically significant difference was observed between the actual and suggested nutrient intake. The mean values of physical, social/family, emotional and functional well-being using the FACT-G scale were computed to be 29,26.5, 24, and 175.5, respectively showing that QoL was poor among study subjects, thus impacting cancer therapy. The assessment of nutritional status and physical, social, emotional and functional well-being in cancer patients is crucial for early detection of malnutrition and poor well-being thus facilitating further deterioration and improving the outcome of cancer therapy.

Key words: Cancer, Nutritional Status, Quality of Life (QOL), Subjective Global Assessment.

Introduction

Cancer is a disease with multifactorial aetiology that can result in death if not treated appropriately. Cancer is caused both by external factors, such as tobacco use, infectious organisms, and unhealthy diets as well as internal factors, such as inherited genetic mutations, hormones, and immune conditions respectively (American Cancer Society, 2016). According to Sung *et al.* (2021), there were an estimated 19.3 million new cases and 10 million cancer deaths worldwide in 2020. In India, non-communicable diseases (NCDs) were estimated to account for 63 percent of all deaths, and cancer was one of the leading causes (9%) (Mathur *et al.,* 2020).

Head and neck tumours represent approximately 40 per cent of total cancers, and one of the main challenges in

the treatment of affected patients is the deterioration of their nutritional status (Brasil and Ministério, 2010). In particular, patients with cancers of the oral cavity, pharynx, larynx and oesophagus have difficulty swallowing, which is a predisposing factor for reduced dietary intake and malnutrition (Mendes et *al.,* 2006). In a study by Chaves *et al.* (2010) assessing the diversity of nutritional status a likely relation was suggested between nutritional status, disease aggressiveness, and consequent association with prognosis. Malnutrition is common and globally impacts all cancer patients by increasing the risk of infection, delaying wound healing, increasing treatment toxicity, prolonging hospital stay, increasing health-related costs thus resulting in in shortened survival (Zamiri *et al.,* 2015 and Vergara *et al.,* 2013).

Subjective Global Assessment(SGA) is a validated method of assessing nutritional status and predicting

complications in many different patient groups, including patients with cancer (Bauer *et al.,* 2002). QoL encompasses the patient's view and perspective of their global health, physical, social, financial, psychosocial performances, as well as symptoms such as pain, fatigue, anorexia, nausea, sleep, sexual dysfunction, and depression (Vergara *et al.*, 2013). According to Heydarnejad *et al.* (2011), several illness-related factors exist that can affect QoL and it is of prime significance to evaluate QoL in cancer patients. Nutrition plays an important role in maintaining better QoL among cancer patients (Vergara *et al.*, 2013). The present study evaluates the nutritional, functional, and QoL of selected male cancer patients in Ernakulam district of Kerala. The primary objectives included nutritional assessment of the selected patients using Modified SGA (Detsky *et al.*, 1987) and evaluating the QoL of cancer patients using the Functional Assessment of Cancer Therapy-General (FACT-G) scale (Cella *et al.,* 1993)

Material and Methods

Patients were purposively selected from the male oncology ward of a hospital in Ernakulam, Kerala. Male oncology patients were exclusively considered for the study because of constraints with respect to availability of subjects during the study tenure. The study population comprised fifty men belonging to the age group of twenty years and above. Patients who were fed exclusively through enteral or parenteral feeding methods were excluded from the study in order to facilitate effective assessment of the dietary intake. An interview schedule was formulated and pretested for data collection. Data pertaining to the medical history, diagnosis, symptoms, and ongoing treatment were elicited using the interview schedule. Subjective Global Assessment (SGA) evaluates the nutritional status based on patient's history and physical examination (Detsky *et al.*, 1987and Read *et al.,* 2006). In the present study dietary patterns of patients before and after the diagnosis of cancer were evaluated. Twenty-four-hour dietary recall was conducted for two consecutive days, and the average nutrient intake among subjects was computed (Longvah *et al.,* 2017) and compared with the Recommended Dietary Allowances of ICMR (2010). The actual nutrient intake and RDA were compared using a t-test to see if there is a statistically significant difference between the intake and the RDA among study subjects. QoL comprises the patient's perspective of physical, social, functional and global health as well as symptoms such as pain fatigue, anorexia, nausea, sleep, sexual dysfunction and depression (Vergara *et al.,*2013).Several illness factors exist in cancer that can affect QoL and it

is significant to assess QoL (Heydarnejad *et al.,*2013*)* To evaluate different outcomes of cancer treatment in clinical practice (Raoof *et al.,* 2015), QoL was measured using the FACT-G scale (Cella *et al.,* 1993). The FACT-G Spanish Version 4, was used in this study, which assesses the physical, social/family, emotional and functional well-being of the subjects (Dapueto *et al.,* 2003). Data was recorded, validated, and stored using the Statistical Package for the Social Sciences (SPSS) Windows Software, version 20. Appropriate interpretation and analysis of the obtained data were carried out.

Results and Discussion

Head and neck cancer was the most frequently occurring, prevalent among 40 percent of the subjects and lung cancer (20 percent) was the second most frequent cancer. The incidence of other cancer included- stomach cancer seven percent, oesophagus cancer ten percent, liver cancer, prostate cancer and anal canal cancer were at two percent each respectively. The time elapsed after diagnosis of the malignancy was one to twelve months in 66 per cent and one to two years in 28 per cent of the subjects respectively.

It was observed that 94 per cent of the study subjects were ambulatory and the remaining six per cent were non-ambulatory. On evaluating the main symptoms during study period, body pain (48 per cent) and weakness/fatigue (94 per cent) were the most common symptoms associated with the disease and the treatment. These symptoms predisposed them to decreased levels of physical activity and long hours in bed. Other major symptoms observed included vomiting (18 per cent), breathing difficulty (20 per cent) and constipation (18 per cent) respectively. A small proportion of study subjects reported oedema and diarrhoea as symptoms. According to Cella *et al.* (2002), fatigue is the most common unrelieved symptom in cancer and is a subjective sensation of weakness, lack of energy, or tiredness and, as a syndrome, has been defined as an overwhelming, sustained sense of exhaustion and decreased capacity for physical and mental work (Table 1).

Prior to the commencement of the study 16 per cent of subjects had undergone chemotherapy and 18 per cent subjects reported radiation therapy as a part of their treatment. During the study period 20 per cent were taking radiotherapy alone and 66 per cent were taking chemotherapy alone. Only few subjects had undergone a surgery as a part of the treatment. A small four per cent of the subjects were under palliative care (Table 2).

Table 1. Details regarding diagnosis of cancer among subjects

n=50

Variables	Frequency (Per cent)
Type of Cancer	
Head and Neck cancer	20 (40)
Lung cancer	10 (20)
Stomach cancer	7 (14)
Esophageal cancer	5 (10)
Liver cancer	1 (2)
Prostate cancer	1 (2)
Anal cancer	1 (2)
Lymphoma	2(4)
Non-Hodgkin's Lymphoma	3 (6)
Time period after diagnosis	
1-12 months	33 (66)
13-24 months	14 (28)
>24 months	3 (6)
Ambulatory/Non-Ambulatory	
Non- Ambulatory	3 (6)
Ambulatory	47 (94)
Main presenting symptoms	
Breathing Difficulty	10 (20)
Vomiting	9 (18)
Weakness/Fatigue	47 (94)
Diarrhoea	4 (8)
Constipation	9 (18)
Oedema	4 (8)
Body Pain	24 (48)

Table 2. Type of cancer treatment among study subjects

n=50

Type of cancer treatment	Past Frequency (Per cent)	Currently Frequency (Per cent)
Surgery alone	4 (8)	1 (2)
Radiotherapy	9 (18)	10 (20)
Chemotherapy	8 (16)	33 (66)
Surgery and Chemotherapy	0 (0)	0 (0)
Chemotherapy and Radiotherapy	4 (8)	0 (0)
Surgery, Chemotherapy and Radiation	0 (0)	0 (0)
Surgery and Radiotherapy	0 (0)	0 (0)
Palliative care	0(0)	2(4)

A very small portion of the study subjects reported a family history of cancer (14 per cent). On studying the risk factors for the occurrence of cancer among study subjects, 92% (46 subjects) reported use of cigarette, tobacco or alcohol. Further, about 86% of the subjects had a habit of smoking daily, followed by consumption of alcohol by 72% of the subjects. About 6 per cent of the subjects had the habit of chewing tobacco regularly (Table 3).

Table 3. Distributions of risk factors pertaining to cancer among study subjects

n=50

Risk factors	Frequency (Per cent)
Risk factors absent	4 (8)
Risk factors present	46 (92)
Daily smokers	43 (86)
Daily alcohol consumption	36 (72)
Chewing tobacco	3 (6)

Nutritional status assessment was conducted among the study subjects and details regarding the anthropometric assessment of subjects is indicated in Table 4. A high prevalence of underweight was observed among study subjects with 68 percent being underweight. None of the study subjects were overweight or obese. Undernutrition is associated with poorer outcome and prognosis, decreased quality of life and poor functional status respectively (Bering *et al.*, 2015)

Table 4: Classification of the subjects based on Body Mass Index

n=50

Variables	Frequency (Per cent)
BMI Classification	
Underweight	34 (68)
Normal Range	16 (32)
Overweight	0 (0)
Pre-obese	0 (0)
Obese	0 (0)

On analysing the dietary habits among patients, before the diagnosis of cancer about 40 per cent of subjects consumed two meals per day. 50 per cent of the subjects consumed three meals a day and 10 per cent had a four meal consumption pattern. Subsequent to the diagnosis of cancer about eight per cent of the subjects had two meal consumption, 52 per cent of the subjects had three meal consumption and 40 per cent had four meal consumption pattern respectively. After the diagnosis of cancer most of the subjects were consuming more frequent meals as compared to the period prior to the diagnosis of cancer (Table -5).

Modifications were made in the diet of study patients after cancer diagnosis based on the dietary and treatment requirements as well as the acceptability of foods. About 82 per cent of the subjects made a change in the consistency of the meal consumed. More than half of the patients (58 %) restricted the number of meals consumed, 56 per cent of the subjects indicated the inclusion of high protein foods and only one percent of the subjects indicated restriction in the consumption of high fat foods (Table-6). None of the study subjects reported the inclusion of specific foods for the treatment of cancer.

Table 5. Frequency of meal consumption among patients

n=50

Frequency of meal consumption	Frequency(percent)	
	Before diagnosis	After diagnosis
Two meals per day	20 (40)	4 (8)
Three meals per day	25 (50)	26 (52)
Four Meals per day	5 (10)	20(40)

Table 6. Modifications made in the diet after cancer diagnosis

n=50

Variables	Frequency (Per cent)
Restricting number of meals	29 (58)
Change in consistency of meal	41 (82)
Inclusion of high protein foods	28 (56)
Restricting the consumption of high fat foods	1 (2)
Inclusion of specific foods for treatment of cancer	0 (0)

From the results pertaining to the daily nutrient intake, the mean values of nutrient intake among patients were statistically significantly lower than the recommended levels. The subjects had a mean of 1435 kcal. for energy, 30 g. for protein, 36 g. for fat, 124 mg. for calcium, 7 mg. for iron and 58 mg. for vitamin-C respectively (Table 7).The intake of Vitamin C was higher that the RDA at 58.3 mg per day because many of the subjects reported consuming lime water frequently as adjunct therapy based on recommendations.

Table 7. Daily Mean nutrient intake among the study subjects

n=50

Nutrients	Actual Intake (mean ± SD)	RDA	t value	p value
Energy (kcal)	1435.1 ± 218.6	2320	-28.62	<.001*
Protein(g)	30 ± 14	60	-15.15	<.001*
Fat(g)	36.1 ± 14	25	5.61	<.001*
Calcium(mg)	124.2 ± 36.2	600	-92.94	<.001*
Iron (mg)	7.2 ± 2.7	17	-25.67	<.001*
Ascorbic acid(mg)	58.3 ± 42.2	40	3.07	<.001*

*Significant at 5 per cent level. 't' values showing a comparison of daily mean nutrient intake and Recommended Daily Allowance(RDA)

Dietary diversity of the subjects was analysed based on the 24 hour dietary recall data. The Dietary Diversity Score (DDS) computation of the diets consumed indicated that 30 per cent of subjects had a low dietary diversity followed by 62 per cent having moderate dietary diversity and only eight per cent having a high dietary diversity. A diet that is diverse with respect to the consumption of different food groups has more scope to provide all nutrients as compared to one that has low diversity.

Table 7. Distribution of subjects by Dietary Diversity Score (DDS)

(n=50)

Dietary Diversity Score(DDS)	Frequency (n)	Per cent (%)
(1-3) Low	15	30.0
(4-7) Moderate	31	62.0
(8 and above) High	4	8.0

Details pertaining to the Modified Subjective Global Assessment (SGA) of study subjects is indicated in Figure 1.Based on the obtained results it was found that 29 patients (58%) were severely malnourished (SGA-C), 16 patients (32%) were mildly-moderately nourished (SGA-B), while only five patients (10%) were well-nourished (SGA-A).A hospital based observational study for evaluating the nutritional status cancer patients by PG-SGA in India by Sharma *et al*.,(2015) revealed that 15.8 percent of patients were well nourished or anabolic(SGA-A),31.9 percent of patients had moderate or suspected malnutrition(SGA-B),52.6 percent of patients were severely malnourished.
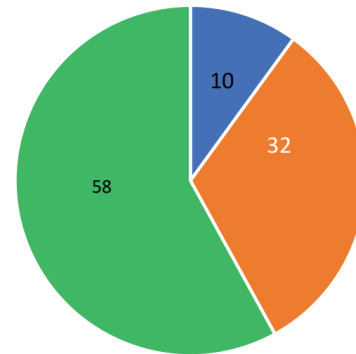
SGA classification of Patients(n=50)

Fig. 1. Modified Subjective Global Assessment (SGA) classification of patients

Details regarding the different domains of Quality of Life (QoL) and functional status of the subjects are depicted in Table 8.

For assessing the Quality of Life (QoL) and functional status of the subject's four different domains namely the physical, social, emotional and functional well-being of the subjects were assessed. From the results it was found that the mean values of most of the domains were low. The mean value of physical well-being, social/family well-being, emotional well-being and functional well-being are 18, 13, 17 and 7 respectively. The lowest mean score was obtained for the functional well-being among the study subjects.

Table 8. Quality of Life (QoL) and Functional Status of patients using FACT-G scale

n= 50

Domains of QoL	Mean± SD	Minimum	Maximum
Physical well-being	18 + 4.4	0	28
Social/family well-being	13 + 4.2	0	28
Emotional well-being	17 + 5.2	0	24
Functional well-being	7 + 6	0	28
FACT-G Total	57+ 10.8	0	108

The study results indicated that head and neck cancer was the most frequent type among patients followed by lung cancer. A majority of patients were in the terminal stages of cancer and under palliative treatment. Only a few patients under study had a family history of cancer. Modifications were made in the diet consumed by patients based on the requirements and acceptability of food. The frequency of meal consumption was low due to various reasons indicated viz., reduced appetite, nausea, taste changes, and difficulty in food consumption. As a result, the nutrient intake was grossly inadequate and patients were close to being malnourished as classified by SGA. The most common problems in regard to this category were: fear about future (29%), thinking about the disease and its consequences (26.5%), lack of energy (24%), and depression (17.5%).

Conclusion

The present study provides valuable data on nutritional assessment, quality of the life and functional status of the patient. Head and neck cancer was the most common type of cancer among patients. High prevalence of underweight was observed with 68 percent of the subjects being underweight Majority of the patients patients had an inadequate nutrient intake with respect to energy, protein, fat, calcium and iron. A statistically significant difference was evident between the actual and suggested nutrient intake. On studying the nutritional status of patients by Subjective Global Assessment more than three fourth of the patients did not belong to the well-nourished category and approximately one-third were severely malnourished.. The mean values of physical, social/family, emotional and functional well-being indicated that QoL was poor among patients, thus impacting cancer therapy. The existing poor nutritional status and inadequate nutrient intake contribute to the vicious cycle of malnutrition in cancer. Nutritional status assessment in cancer patients is critical for the early detection of malnourished patients and is a window of opportunity for prompt nutritional intervention helping to prevent further nutritional deterioration and muscle wasting.

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