RESEARCH ARTICLE

Exploring Malnutrition Risk in Cancer Chemotherapy Patients: An Assessment of Associated Factors in a Tertiary Care Cancer Center

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Abstract

Objective: This study aimed to assess the risk of malnutrition in cancer chemotherapy patients and identify associated factors. **Materials and methods:** This cross-sectional study employed purposive sampling to collect data from patients at a tertiary care cancer center. The study included 101 participants. Data was collected using a malnutrition screening tool (MST) to assess the risk of malnutrition. **Results:** The majority of participants were female (61.4%) and diagnosed with cancer in stage 3 or 4 (57.4% and 41.6%, respectively). Sixty-three point four percent (63.4%) of participants reported unintentional weight loss during chemotherapy, and 60.4% were at risk for malnutrition. Cancer stage was significantly associated with malnutrition risk, while other clinical variables were not. **Conclusion:** Malnutrition is a significant issue among cancer chemotherapy patients in this study's population. The findings highlight the need for interventions to prevent and manage malnutrition in cancer patients. This could potentially improve the effectiveness of cancer treatment, particularly within the Indian population.

Keywords: Cancer patients- Chemotherapy- Malnutrition- Risk assessment

Introduction

Cancer is a major health issue worldwide, with India being no exception. Cancer incidence is increasing rapidly in India, and it is estimated that there will be 1.7 million new cancer cases by 2035 [1]. Chemotherapy is one of the primary treatment modalities used in cancer patients and is associated with various adverse effects, including malnutrition.

Malnutrition is a common complication in patients with cancer and can negatively affect the effectiveness of cancer treatment and quality of life. Various factors, such as loss of appetite, side effects of chemotherapy, and cancer, can cause malnutrition. Malnutrition in cancer patients can lead to various adverse outcomes, including decreased tolerance to chemotherapy, reduced response to treatment, increased risk of infections, longer hospital stays, and increased mortality rates [2, 3].

In India, malnutrition is a significant public health concern; it is estimated that more than 50% of cancer patients are malnourished [4]. Malnutrition in cancer patients is a complex issue involving various factors, including socioeconomic status, lack of access to adequate nutrition, cultural factors, and dietary habits. The prevalence of malnutrition is particularly high in cancer patients from low-income and marginalized communities [5].

Despite the high prevalence of malnutrition among patients with cancer in India, there is limited research on the assessment of malnutrition risk among cancer patients undergoing chemotherapy. Therefore, there is a need to explore factors associated with malnutrition in cancer

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chemotherapy patients in the Indian population.

The rationale of this study is to identify the factors associated with malnutrition in cancer chemotherapy patients. This study will help to understand the nutritional status and needs of cancer chemotherapy patients and to provide appropriate nutritional interventions to improve their treatment outcomes and quality of life. The current study will contribute to the existing literature on malnutrition in cancer patients and provide evidence-based recommendations for policy and practice. The main objective of the current study is to screen cancer patients undergoing chemotherapy for Malnutrition Risk.

Materials and Methods

It is a Cross-sectional study. Purposive sampling was used to collect data from a tertiary care cancer in Mysuru district, Karnataka, India. The sample size was determined based on the prevalence of cancer in the district, which was 2% according to the ICMR-Hospital Based Cancer Registry (HBCR) 2021. With a prevalence of 2%, absolute precision of 2.8%, and confidence interval of 5%, 97 participants were recruited for the current study. Considering a non-response rate of 5%, 101 samples were required for the study. Data were collected over two months from the tertiary care hospital. This study adhered to the ethical standards outlined in the 1964 Declaration of Helsinki and its later amendments. All procedures involving human participants were conducted following the guidelines of the institutional ethical committee. The study was approved by the Institutional Ethical Committee (approval number: JSSMC/IEC/03072023). Informed consent was obtained from each participant before the commencement of the study. Data were entered into Microsoft Excel 2019 and analyzed using SPSS version 25 (IBM Corp, USA). Data analysis involved descriptive statistics in determining the frequency and percentage of different needs, and the chi-square test was used to explore the associations between dependent and independent variables. Malnutrition risk assessment was done using the Malnutrition Screening Tool (MST) developed by Abbott Laboratories.

Results

Data were collected from a total of 101 participants. Most participants in the current study were females (61.4%), and 38.6% were men. Most participants in the current study belonged to the Hindu religion (92.1%), whereas only 4% belonged to Muslims and Christianity.

Of the participants, 54.5% belonged to rural areas, and 45.5% were from urban areas. Most participants in the current study were illiterate (33.7%), and 12.9% had a diploma or degree.

Most of the participants in the current study were semi-skilled (33.7%), and the least were unskilled (13.9%).

The majority of the participants belonged to socioeconomic class II; that is, their income was between 3504 -7007(INR), and the least (5%) belonged

Table 1. Clinical Characteristics of the Study Participants

Personal history	n	%
Stage of cancer		
3	58	57.40
4	42	41.60
Type of tumour		
Regional	4	4.00
Localized Metastasis	84	83.20
Metastasis	13	12.90
Comorbidities		
Diabetes Mellitus	3	3.00
Diabetes Mellitus & Cardio Vascular Diseases	3	3.00
Diabetes Mellitus & Hypertension	6	5.90
Hypertension	4	4.00
Nil	85	84.20
Treatment		
Chemotherapy	67	66.30
Surgery + Chemotherapy	15	14.90
Chemotherapy & Radiation	6	5.90
Surgery + Chemotherapy + Radiation	13	12.90
Type of Cancer		
Acute leukaemia	6	5.90
Carcinoma of breast	13	12.90
Carcinoma of colon	2	2.00
Carcinoma of oesophagus	11	10.90
Carcinoma of leiomyosarcoma	3	3.00
Carcinoma of lung	34	33.70
Carcinoma of ovary	5	5.00
Carcinoma of rectum	18	17.80
Carcinoma of stomach	9	8.90

Values are expressed as frequency and percentages.

to socioeconomic class V (Rs 1050 and below).

Most of the participants in the current study had joint families (49.5%), followed by nuclear families (42.6%) and three-generation families (7.9%).

Personal History and disease profile

Table 1 shows that most of the participants in the current study were in 3rd stage of cancer (57.4%), and 41.6% were in 4th stage. Localized metastasis was observed in 83.2% of the participants, whereas regional tumours were observed in 4%. Comorbidities were absent in most participants (84.2%), and hypertension and diabetes were observed in very few cases.

The majority of participants were undergoing chemotherapy (66.3%), followed by surgery + chemotherapy (14.9%), and triple therapy (surgery + chemotherapy + radiation) (12.9 %).

Of the participants, 33.7% had lung cancer, and 17.8% had rectal carcinoma, followed by breast carcinoma (12.9%), oesophagal carcinoma (10.9%), and stomach carcinoma (8.9%). Acute leukaemia was present in 5.9%

Table 2. Recent Weight Loss among the Study Participants

Have you recently lost weight without trying?	N	%
0.9 - 5.9 Kg	43	42.6
6.35 - 10.43	24	23.8

Values are expressed as frequency and percentages.

Table 3. Factors Associated with Malnutrition Risk in Chemotherapy Patients

Clinical characteristics		MST Risk			
		NOT At Risk	At Risk		
		N (%)	N (%)	Chi-square value	p-value
Stage of cancer	3	21 (52.50)	37 (61.70)	1.828	0.04*
	4	19 (47.50)	23 (38.30)		
Comorbidities	Diabetes Mellitus	0 (0.00)	3 (4.90)	6.306	0.177
	Diabetes Mellitus & Cardio Vascular Diseases	0 (0.00)	3 (4.90)		
	Diabetes Mellitus & Hypertension	3 (7.50)	3 (4.90)		
	Hypertension	3 (7.50)	1 (1.60)		
	Nil	34 (85.00)	51 (83.60)		
Treatment	Surgery	0 (0.00)	0 (0.00)	1.462	0.691
	Chemotherapy	28 (70.00)	39 (63.90)		
	Radiation	0 (0.00)	0 (0.00)		
	Surgery & Chemotherapy	4 (10.00)	11 (18.00)		
	Chemotherapy & Radiation	3 (7.50)	3 (4.90)		
	Surgery + Chemotherapy + Radiation	5 (12.50)	8 (13.10)		
Type of Cancer	Acute leukaemia	1 (2.50)	5 (8.20)	12.296	0.138
	Carcinoma of breast	6 (15.00)	7 (11.50)		
	Carcinoma of colon	1 (2.50)	1 (1.60)		
	Carcinoma of oesophagus	4 (10.00)	7 (11.50)		
	Carcinoma of leiomyosarcoma	2 (5.00)	1 (1.60)		
	Carcinoma of lung	11 (27.50)	23 (37.70)		
	Carcinoma of ovary	5 (12.50)	0 (0.00)		
	Carcinoma of rectum	8 (20.00)	10 (16.40)		
	Carcinoma of stomach	2 (5.00)	7 (11.50)		

Values are expressed as frequency and percentage. The P-value is by chi-square test. A p-value of less than 0.05 is considered statistically significant.

of the participants.

Recent weight loss

In the current study, most participants experienced weight loss (63.4%) without trying chemotherapy. Of these, 42.6% had weight loss between 0.9 to 5.9 Kg, and 23.8% had weight loss between 6.35 to 10.4 Kg (Table 2).

Of the participants, 56.4% reported that they had been eating poorly because of their decreased appetite. The weight loss score of the participants was 2.09±1.6, the appetite score was 0.57±0.4, and the malnutrition screening test score ranged from 0 to 5, with a mean of 2.5±2.0.

The malnutrition screening risk showed that most participants were at risk for malnutrition (60.4%), whereas the rest were not (39.6%).

Cancer stage was associated with malnutrition risk with a chi-square value of 1.8 and a p-value of 0.04, which shows statistical significance. Other clinical variables did not show any associations (Table 3).

Discussion

The present study investigated the prevalence of malnutrition among cancer patients undergoing chemotherapy in rural and urban settings in India. The results indicated that most participants experienced weight loss without trying, with most reporting a poor appetite. The malnutrition screening test score revealed that the majority of the participants were at risk of malnutrition. These findings are consistent with previous studies conducted in patients with cancer undergoing chemotherapy.

Several studies have demonstrated a high prevalence of malnutrition among cancer patients undergoing chemotherapy. A study by Isenring et al.

reported that 50-80% of cancer patients experience weight loss during chemotherapy, and up to 60% develop malnutrition [6]. Similarly, a study by Ravasco et al. reported that 50-80% of cancer patients undergoing chemotherapy experience weight loss, with 40-60% developing malnutrition [7]. Another study by Agarwal et al. reported a high prevalence of malnutrition among cancer patients undergoing chemotherapy in India, with 70.9% of participants at risk for malnutrition [8].

The present study also found that the cancer stage was associated with malnutrition risk, consistent with the findings of previous studies. A study by Andreyev et al. reported that patients with advanced cancer were at a higher risk of developing malnutrition than those with early-stage cancer [9]. Similarly, a study by Gupta et al. reported that patients with advanced cancer had a higher risk of malnutrition than those with early-stage cancer [10].

Furthermore, this study found that most participants were illiterate, belonged to a lower socioeconomic class, and had joint families. This is consistent with previous studies conducted on cancer patients in India [10]. These findings highlight the need for targeted interventions to address the unique needs of cancer patients from disadvantaged backgrounds.

In conclusion, the present study provides further evidence of the high prevalence of malnutrition among cancer patients undergoing chemotherapy in India. These findings suggest the need for routine screening and timely management of malnutrition among cancer patients undergoing chemotherapy, particularly those with advanced cancer. Moreover, targeted interventions are needed to address the unique needs of patients with cancer from disadvantaged backgrounds to ensure that they receive adequate nutrition during chemotherapy.

Acknowledgements

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