

An Evaluation of Nutritional Status Of Patients in Radiation Oncology Inpatient Service Radiation Oncology and Nutrition

Radyasyon Onkoloji Servisinde Yatan Hastaların Beslenme Durumunun Değerlendirilmesi

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Geliş Tarihi/Received 03.12.2023
Kabul Tarihi/Accepted 30.01.2024
Yayın Tarihi/Publication Date 30.04.2024

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Cite this article: Durmaz H, Yılmaz T, Kanyılmaz G, Yavuz BB, Aktan M. An Evaluation of Nutritional Status of Patients in Radiation Oncology Inpatient Service Radiation oncology and nutrition. *Atatürk Univ Fac Med J Surg Med Sci.* 2024;3(1): 7-11



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ABSTRACT

Objective: The nutritional status of cancer patients in radiation oncology inpatient service is not clear. This cross-sectional study on patients with cancer aimed to search the prevalence of the risk of malnutrition in this patient group.

Methods: We retrospectively searched 373 patients who underwent radiation therapy in radiation oncology inpatient unit between December 2018 and January 2022. Patients' demographic information, NRS-2002 scores, as well as dose and fractionation data regarding radiation treatment, were collected. Additionally, the areas where patients undergo radiotherapy were classified into five main sections and others.

Results: The majority of patients (66%) were male. Non-small cell lung cancer (NSCLC) were the most common primary diagnosis. The primary intent of radiotherapy was palliative radiotherapy for 210 patients (56.3%). Majority of patients (46.4%) were in normal BMI range. 1.9% of patients' scored ≥ 3 in NRS-2002 scoring at inpatient admission. The majority of patients had undergone radiotherapy in two main regions: musculoskeletal system (25.2%) and central nervous system (24.9%).

Conclusion: The result of the survey does not show high malnutrition rate in radiation oncology inpatient service. However, the importance of the need for a systematic screening for malnutrition and supporting patients with multidisciplinary nutrition team is the key of cancer care in inpatient services. Due to the fractionation schedule in radiotherapy, continuity is crucial, and factors such as hospitalization of patients for social reasons besides medical treatments, the retrospective design of the study, may have influenced the study results.

Keywords: NRS-2002, Radiation oncology, Inpatient service

ÖZ

Amaç: Radyasyon onkoloji servisinde yatan kanser hastalarının beslenme durumları net değildir. Kanser hastaları üzerinde yapılan bu kesitsel çalışma, bu hasta grubundaki malnütrisyon riskinin yaygınlığını araştırmayı amaçladı.

Yöntemler: Bu çalışmada Aralık 2018 ile Ocak 2022 tarihleri arasında radyasyon onkolojisi servisinde radyoterapi gören 373 hastayı retrospektif olarak araştırdık. Hastaların demografik bilgileri, Nutrisyonel Risk Skoru-2002 (NRS-2002) skoru, radyoterapiye ilişkin doz ve fraksiyon verileri toplandı. Ayrıca hastaların radyoterapi aldıkları bölgeler 5 ana kısım ve diğerleri olmak üzere sınıflandırıldı.

Bulgular: Hastaların çoğunluğu (%66) erkekti. Küçük hücreli dışı akciğer kanseri (KHDAK) en sık görülen birincil tanıydı. Radyoterapinin birincil amacı 210 hastada (%56,3) palyatif radyoterapiydi. Hastaların çoğunluğunun (%46,4) normal VKİ (vücut kitle indeksi) aralığında olduğu görüldü. Yatan hasta başvurusunda NRS-2002 skorlamasında hastaların %1,9'unun puanı ≥ 3 idi. Hastaların çoğunluğu şu iki bölgeye radyoterapi almıştı; kas-iskelet sistemi (%25,2) ve santral sinir sistemi (%24,9).

Sonuç: Araştırmanın sonucu radyasyon onkolojisi yataklı servisinde yetersiz beslenme oranının yüksek olmadığını gösteriyor. Ancak malnütrisyona yönelik sistematik bir taramanın yapılması ve hastaların multidisipliner beslenme ekibiyle desteklenmesi yataklı tedavi hizmetlerinde kanserli hasta bakımının anahtarıdır. Bu bakımdan bu hasta grubunda beslenme durumunun değerlendirilmesiyle ilgili daha çok çalışmaya ihtiyaç vardır. Radyoterapide fraksiyonasyon şeması nedeniyle devamlılık önem arz etmekte olup medikal tedavilerin haricinde sosyal sebepler nedeni ile servis yatışı yapılan hastaların da katılmış olması, çalışmanın retrospektif yapılması, çalışmanın sonuçlarını etkilemiş olabileceğini düşündüğümüz faktörler arasında bulunmaktadır.

Anahtar Kelimeler: NRS-2002, Radyasyon onkolojisi, Yataklı servis

INTRODUCTION

Reduced nutritional intake and metabolic disorders cause malnutrition in cancer patients. The causes for decreased food intake are complex and multi-factorial. Inflammation, imbalanced metabolism, toxicities of cancer treatments, inadequate nutrition and hormonal problems are reasons for the multifactorial effect of malnutrition.^{1, 2} Due to the high frequency of nutritional and metabolic imbalance in cancer patients, screening is crucial.²⁻⁴ Various tumor types, treatment toxicities and nutrition related factors are multifactorial process of weight loss in patients undergoing radiation therapy (RT).⁵ The European Society for Clinical Nutrition and Metabolism (ESPEN) guidelines suggest using the amount of weight loss as the most dependable indicator of nutritional deficit.² The aim of nutrition risk screening is to increase awareness, recognize early signs and initiate treatment. For screening purposes, ESPEN recommends to use body mass index (BMI), weight loss and index of food intake which obtained either directly or via validated screening tests. Nutrition Screening 2002 (NRS-2002), Malnutrition Universal Screening Tool (MUST), Malnutrition Screening Tool (MST) and Mini Nutritional Assessment Short Form Revised are routinely used as brief, inexpensive, highly sensitive tests with good specificity.^{2, 3} In previous studies, NRS-2002 has been found to be a useful test for the nutritional evaluation of hospitalized cancer patients. For increasing the capability of predicting nutritional risk of NRS-2002 is better with BMI and age used together.⁶

Patients with cancer have more nutritional problems than non-cancer patients.⁷ Additional treatments such as RT, especially targeted to head and neck and pelvic regions, carry potential side effects to nutritional status of patients. Routine follow up during treatment is important in order to start early nutritional support which is especially more important in patients at risk groups such as females and high BMI before treatment.^{2,8} An individualized nutritional intervention based on a multimodal approach which could be designed by oral and enteral feeding as a starting point. Later, if it is insufficient to supply required amounts of nutrition, parenteral nutrition is indicated.²

Even though guidelines suggest to perform screening tests, there is no consensus data about evaluating screening and what cut-off values should be used for further interventions after screening tests for daily practice. There is not enough data to design individualized nutrition pathways from abnormal screening results by themselves. Further data are required on evaluation and intervention strategies after screening of nutritional status. However, the

goal of the patients' care giver team remains to fight against malnutrition with close collaboration among experts and nutritional societies.^{1,2}

In this study, our objective is to assess nutritional status of patients in radiation oncology inpatient service from a cross-sectional perspective in order as one of the essential steps for further prospective nutritional evaluation studies.

METHODS

We obtained institutional review board permission from Necmettin Erbakan University for this study (Date: 01/07/2022 Decision No: 2022/3877). We retrospectively searched patients who got RT in radiation oncology inpatient unit between December 2018 and January 2022. Patients' demographic information, NRS scores, dose and fractionation data about radiation treatment obtained from the patients' hospital records. We retrospectively reviewed 432 patients. We removed patients who had missing information on the records and younger than 18 years old. We used 373 patients' data for statistical analysis. Data analysed with IBM SPSS Statistics 23 (IBM Corp., Armonk, NY) programme. Categorical variables analysed with frequency distribution.

RESULTS

Majority (66%) of 373 patients were male. Median age was 63. On the top 3 primary histologies of the patients were 86 (23.1%) non-small cell lung cancer (NSCLC), 53 (14.2%) were breast cancer, 31 (8.3%) were small cell lung cancer (SCLC). RT intent of patients was divided into palliative and curative settings. 210 patients (56.3%) received palliative RT. The RT sites of the patients were divided into 6 categories, and the majority of patients (25.2%) received RT on musculoskeletal sites. Detailed characteristics information of patients and treatment was included in Table 1. The majority of patients (46.4%) were in normal BMI range. Detailed information about the percentages of BMI ranges showed in figure 1. 55.2% of patients were scored 1 and 1.9% of patients' score was ≥ 3 in NRS-2002 scoring at inpatient admission.

DISCUSSION

In a study about acute hospital admission of patients treated with curative RT, the most common disease site reported as thoracic (22.8%) followed by head and neck (22.2%) and gastrointestinal (18.3%). CNS tumors were the most common, but commonly discharged to rehabilitation, not admitted to inpatient services. Conversely, researchers found that breast tumors and bone tumors were likely to be

discharged from emergency department.⁹ In our study we have patients treated with both palliative and definitive intended RT. Quarter percentage of our patients' primary irradiated site was musculoskeletal which is probably due to

palliative RT. CNS and thoracic site were followed after musculoskeletal site. NSCLC is the most common primary histology of our inpatients followed by breast and nasopharyngeal cancer.

Table 1. Patients & Treatment Characteristics.

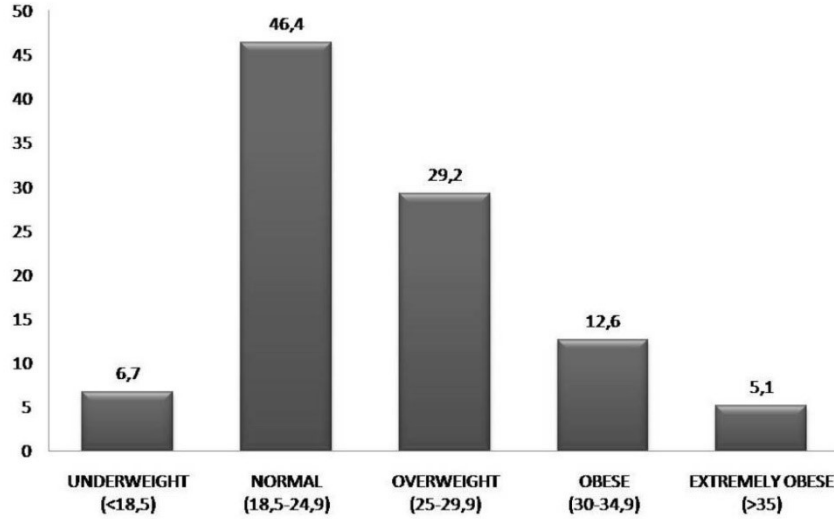
Characteristics	N (%)	Mean (range)	Median (range)
Age (years)			63 (21-93)
Gender			
Male	246 (66.0)		
Female	127 (34.0)		
Height (cm)		165.8 (140-190)	
Weight (kg)		69.4 (38-130)	
BMI		25.2 (15.2-43)	
Diagnosis			
NSCLC	86 (23.1)		
Breast Ca	53 (14.2)		
SCLC	31 (8.3)		
Nasopharynx Ca	23 (6.2)		
Prostate Ca	22 (5.9)		
Others	158 (42.3)		
Number of Fraction			12 (1-36)
Dose Fraction (cGy)			250 (180-900)
Total Dose (cGy)			3000 (800-7632)
Treatment Intent			
Paliative	210 (56.3)		
Curative	163 (43.7)		
Radiotherapy Site			
Musculoskeletal	94 (25.2)		
CNS	93 (24.9)		
Head-Neck	56 (15.0)		
Lung	55 (14.7)		
Breast	14 (3,8)		
Others	61 (16.4)		
NRS-2002 Score			
1	206 (55.2)		
2	160 (42.9)		
≥3	7 (1.9)		

BMI: Body Mass Index, cm: centimeters, kg: kilograms, NSCLC: non small cell lung cancer, Ca: cancer, SCLC; small cell lung cancer, cGy: centigray, CNS: central nerve system.

In NRS-2002 screening test, nutritional risk is considered for scores ≥ 3 .¹⁰ In a previous study, the malnutrition risk among hospitalized oncology patients was reported as 33.9% upon admission.¹¹ However, only 1.9% of our patients were ≥ 3 score in NRS-2002 at our service. Compared with the literature, the malnutrition risk rate was low in our inpatient clinic. Also, the percentage of overweight patients was higher than our underweight patients. One of the

reasons for the low malnutrition rate may be the nature of cross-sectional retrospective study in which we do not know previous treatment of malnutrition or any other interventions. Also, the majority of our patient population is younger than 65 years old, which might have an effect on the low NRS-2002 score. Another possible reason for the low malnutrition rate in our series could be hospitalization due to transportation problems to the RT unit.

Figure 1. The percentage of patients' body mass index ranges.



To our knowledge, synergistic effect between RT and chemotherapy increased acute hospital admissions from 20% in RT only group to approximately 60% in concurrently treated group.⁹ This might have an effect on nutritional status of our hospitalized patients. However, we are unable to provide our patients' concurrent chemotherapy information.

This study has limitations inherent to any retrospective study as missing information about follow up. In previous studies, both BMI and weight loss independently predicted the overall survival of cancer patient.⁴ However, we were unable to report that follow up information of our patients' weight loss, nutritional intervention, second NRS-2002 score results. Also, we do not have specified data about nutritional interventions, chronic diseases and concurrent chemotherapy. These might have an effect on low malnutrition screening ratio of our inpatients.

As a summary, we aimed to look at nutritional status of patients in radiation oncology inpatient unit from a cross sectional view in this study. When we screened the risk of malnutrition of inpatients in the radiotherapy inpatient service using the NRS 2002 test, we did not detect an increased risk in our study. Further research is required in order to optimize nutritional intervention and follow up data for evaluating the nutritional status of patients in radiation oncology inpatient service.

Ethics Committee Approval: Ethics committee approval was obtained from Necmettin Erbakan University Local Ethics Committee (Date: 01.07.2022, Number: 2022/3877)

Informed Consent: Our study, for which ethical approval was received, is a cross-sectional study and patient consent is not required.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - GK, BBY, MA Design- TY, HD; Supervision- GK, BBY, MA; Resources- GK, BBY, MA; Data Collection and/or Processing- HD, TY,; Analysis and/or Interpretation- HD, TY, GK,; Literature Search-TY; Writing Manuscript-TY, HD; Critical Review- GK, BBY, MA;

Conflict of Interest: The authors have no conflicts of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

Etik Komite Onayı: Etik kurul onayı Necmettin Erbakan Üniversitesi İlaç ve Tıbbi Cihaz Dışı Araştırmalar Etik Kurul Başkanlığı'ndan (Tarih: 01.07.2022, Sayı:2022/3877) alınmıştır

Hasta Onamı: Etik onayı alınan çalışmamız cross sectional bir çalışma olup, hasta onamı gerekmemektedir.

Hakem Değerlendirmesi: Dış bağımsız.

Yazar Katkıları: Fikir: GK, BBY, MA, Tasarım: TY, HD, Denetleme: GK, BBY, MA, Kaynaklar: GK, BBY, MA; Veri Toplanması ve/veya İşlemesi; HD, TY, Analiz ve/ veya Yorum: HD, TY, GK, Literatür Taraması: TY, Yazıyı Yazan: TY, HD, Eleştirel İnceleme: GK, BBY, MA

Çıkar Çatışması: Yazarlar, çıkar çatışması olmadığını beyan etmiştir.

Finansal Destek: Yazarlar, bu çalışma için finansal destek almadığını beyan etmiştir.

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