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Evaluation of The Distribution of Oncology Patients Admitting to Emergency Department According to Clinical Symptoms

Acil Servise Başvuran Onkoloji Hastalarının Klinik Semptomlara Göre Dağılımının Değerlendirilmesi

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ÖZET
Amaç: Kanser, sistemik bir hastalık olup her evresinde tüm sistemleri farklı şekilde etkileyebilir. Kanserli hastalar mevcut malignitelerinin doğrudan veya dolaylı neden olduğu akut semptomlar nedeniyle sıklıkla acil servise başvurmaktadırlar. Bu çalışma ile acil kliniğine başvuran onkoloji hastalarının başvuru nedenleri ve sık karşılaşılan problemlerinin araştırılması amaçlanmıştır.
Materyal ve Metot: Bu çalışma kesitsel retrospektif bir çalışmadır. Bu başvurulardan acil servisteki değerlendirme sonunda acil servis tanılarının yanında ICD-10'a göre malign neoplazm tanılarından değerlendirilip, hasta kayıt bilgisayarına kaydedilen 18 yaş ve üzerindeki tüm olgular örneklemi oluşturmaktadır. Hastaların demografik incelemesinde betimleyici istatistik kullanıldı. Çalışmada verileri değerlendirilirken nitel olması halinde ki-kare(χ^2) testi veya Fisher exact testi uygulandı**.**
Bulgular: Belirtilen dönemde çalışmaya 43'ü (%58.1) kadın, 32'si (%42.6) erkek olmak üzere 75 hasta dahil edildi. En sık rastlanılan şikayet %77 (n=57) ağrı şikayeti olup sırası ile %36.5(n=26) nefes darlığı, %35.1(n=25) bulantı-kusma idi. Hastalarda mevcut maligniteler içinde en sık görülen ilk üç kanser sırasıyla akciğer %26.7 (n=20), %14.6 (n=11) prostat ve %10.7(n=8) meme kanserleri idi.
Sonuç: Günümüz şartlarında artan malignite hastalarının hem kanser hastalığına bağlı hem de tedavi protokollerinden dolayı yaşam kaliteleri düşmektedir. Özellikli bu hasta grubu hem hastalığın vücuda yansıdığı rahatsızlık hem de tedavi esnasında oluşan yan etkilerden dolayı ileri dönemlerde bu özellikli hasta grupları için onkoloji uzmanları ile iş birliği ile acil tıp kliniklerine üniteler açılabileceği ve acil servis planlamalarında özel yaklaşım politikalarının belirlenmesinde katkı sağlayacağı kanısındayız.

Anahtar Kelimeler: Onkoloji hastaları, Maligniteye bağlı semptomlar, Acil servis.

ABSTRACT
Objective: Cancer is a systemic disease, and can affect all systems differently at each stage. Cancer patients often admit emergency departments due to acute symptoms directly or indirectly caused by their current malignancies. With this study, the purpose was to investigate the causes of admission and common problems of oncology patients admitting to the emergency department.
Material and Method: This study has a cross-sectional and retrospective design. At the end of the evaluation in the emergency department, all cases who were aged 18 and over, who were evaluated based on malignant neoplasm diagnoses according to ICD-10, and recorded in the patient registration computer made up the study sampling. Descriptive statistics were used in the demographic examination of the patients.In the study, in case the data were qualitative, the Chi-Square (χ^2) Test or Fisher's Exact Test were used.
Results: A total of 75 patients were included in the study during the specified period, including 43 (58.1%) women and 32 (42.6%) men. The most common complaint was pain with 77% (n=57), followed by shortness of breath with 34.6% (n=26), and %33.3 (n=25) nausea and vomiting. In patients, the top 3 most common malignancies were lung 26.7% (n=20), 14.6% (n=11) prostate, and 10.7% (n=8) breast cancer, respectively.
Conclusion: In today's conditions, the quality of life of patients with increased malignancies is reduced because of the cancer disease and treatment protocols. We believe that specific units can be opened in emergency medicine clinics in cooperation with oncology specialists for this patient group in the future because of the discomfort in which the disease is reflected in the body, and due to the side effects that occur during treatment, which will contribute to the determination of special approach policies in emergency department planning.

Keywords: Oncology patients, Symptom due to malignancy, Emergency departments.

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INTRODUCTION

Cancer is a systemic disease and can affect all systems differently at each stage. According to TUIK 2018 data, circulatory system diseases make up the first cause of death in our country, and cancer-related deaths rank the second (Tuik, 2018). Cancer patients often admit emergency departments due to acute symptoms directly or indirectly caused by their current malignancies (WHO, 2019). In the U.S.A., it is reported that more than 4.5 million cancer patients are reported to be admitting to emergency departments due to different symptoms (Rivera et al., 2017). Today, oncology disease and related treatment protocols are increasing, and the life expectancy of patients is prolonged accordingly. Emergency department treatment services become important in acute conditions related to cancer and its treatment in this process (Bozdemir et al., 2009; Klemencic and Perkins, 2019). It is important for oncology patients to ensure the comfort of life with early diagnosis and appropriate treatment especially in the palliative period (Dunne-Daly, 1994; Neilan, 1994). In a study conducted in the literature, it is reported that cancer patients admit to emergency departments (ED) more frequently during palliative periods especially in the last six months of their lives because of decreased functional capacities, impaired pain control, and changes in consciousness (McCarthy et al., 2000). Although the care of cancer patients is managed in the oncology department in the healthcare system more often, treatment or visits of this patient group to the emergency department with possible side effects of their diseases may sometimes be inevitable (Bluethmann et al., 2016).

With this study, the purpose was to investigate the causes of admission and common problems of oncology patients admitting to the emergency department.

MATERIAL and METHOD

Study Design

The present study was conducted at Yozgat Bozok University Emergency Medicine Clinic between 01.01.2019 and 31.12.2019 by examining the hospital automation system and the files of patients who had previously been diagnosed with cancer and who admitted to the emergency department with complaints related to their diseases. This study has a cross-sectional and retrospective design. The approval was received from the local ethics committee to conduct the study (Yozgat Bozok University, Clinical Research Ethics Committee; 2017-KAEK-189_2019.12.11_02, 11.12.2019). Since there is no Oncology Unit in our hospital, the patients who are scheduled to be hospitalized are consulted in the Internal Diseases Unit and surgery units. At the end of the evaluation in the emergency department, all cases who were aged 18 and over, who were evaluated based on malignant neoplasm diagnoses according to ICD-10, and recorded in the patient registration computer made up the study sampling.

Each case admitting to the Emergency Department is recorded in the database at the end of the evaluation with one or more diagnostic codes to identify the cause of admission and chronic diseases. Neoplastic disease diagnosis codes were used for pre-histologically finalized cancer diagnosis. The patients who were recorded as malignant neoplastic disease were identified from the hospital records, and all hospital admission of these cases were determined during this period.

Patient population

The cases and their admissions were evaluated individually. The age, gender, and descriptive characteristics of the cases were recorded. Emergency admission-related complaints and emergency department findings were evaluated; and the type of cancer and the date of diagnosis were obtained. The admission complaint reasons were also determined. The emergency forms and general patient files records were used comparatively to access the data.

Statistics analysis

The patients were evaluated in terms of demographic characteristics, previous diseases, causes of

admission, common clinical and laboratory abnormalities, and their results. The resulting data were recorded in a form prepared for the study. All statistical data were analyzed with SPSS 20.0 for Windows Program (version 20.0; SPSS, Chicago, IL). Descriptive statistics were used in the demographic examination of the patients. In the study, in case the data were qualitative, the Chi-Square (χ^2) Test or Fisher's Exact Test were used. When evaluating the study data, the numeric values were expressed as mean ± standard deviation. The results were evaluated for a significance level of $p < 0.05$.

RESULTS

Between 01.01.2019 and 31.12.2019, there were 16500 emergency service applications and an average of 45 patient applications per day. A total of 75 patients were included in the study during the specified period, including 43 (58.1%) women and 32 (42.6%) men. The mean age was 58.5 years, and the median value was 59 (min: 35, max: 86). The complaints of the patient about the emergency department are given in Table 1. In this respect, the most common complaint was pain with 77% (n=57), followed by shortness of breath with 34.6% (n=26), and %33.3 (n=25) nausea and vomiting. In patients, the top 3 most common malignancies were lung 26.7% (n=20), 14.6% (n=11) prostate, and 10.7% (n=8) breast cancer, respectively. A total of 60.5% (n=45) of the patients were discharged from the emergency department after the first intervention, and 10.1% (n=7) were admitted to the intensive care unit, and 30.4% (n=23) were admitted to the wards. The organ and other organ metastasis, from which the malignancy of the patients originated, are shown in Table 1. In this respect, 4% (n=3) had bone metastasis, and 5% (n=7) had lung metastasis (Table 1).

Table 1. Demographic Distribution of Patients

Demographic data	%(n)
Gender	
Female %(n)	58.1(43)
Male %(n)	42.6(32)
Age mean (min; max)	58.5 (35;86)
Cancer type	
Lung cancer	26.7(20)
Prostate cancer	14.6(11)
Breast cancer	10.7(8)
Liver cancer	3(2.7)
Pancreas cancer	1(1.3)
Stomach cancer	2(2.7)
Colon cancer	3(4)
Bladder cancer	1(1.3)
Brain cancer	4(5.3)
Symptoms	%
Pain	77(57)
Shortness of breath	34.6(26)
Hemoptysis	6.4(5)
Oral intake disorder	30(22)
Melena	4.1(3)
Nausea and vomiting	33.3(25)
Epileptic seizures	4.1(3)
Loss of consciousness	4.1(3)
Hematuria	10.6(8)
Metastasis	
Bone metastasis	4(3)
lung metastasis	5(7)
The frequency of the admission of the patients	
Admitted 1 time	28.1(21)
Admitted 2 times	14.7(11)
Admitted 3 times	16(12)
Admitted 4 times	10.8(8)
Admitted 5 times	10.8(8)
Admitted 6 times	9.5(7)
Admitted 7 times	4.1(3)
Admitted 8-10 times	5.6(4)

As seen in Table 2, when the variables in the dataset were evaluated according to the gender of the patients, the difference in cancer types was found to be statistically significant (x2: 48.900; p<0.001). When the ages of the patients were evaluated according to their gender in our study, the mean age of the male gender was significantly higher than that of the female gender (z-3.760; p<0.01). The number of emergency department admissions was high in male gender, and this difference was found to be significant (z:-4.207; p<0.01). The evaluation of the emergency department admission symptoms of patients by gender is shown in Table 3. In this respect, there was no significant difference in symptoms such as pain, dyspnea, and nausea-vomiting (>0.05); however, there was a significant difference in dysuria and hematuria symptoms (0.026, 0.020). Other organ metastasis of the patients did not differ according to their gender (p=0.782). Although 44% (n=33) of patients had admissions to the emergency department with chemotherapy-related complaints, there were no differences between the groups according to the gender variable (p=0.056).

The frequency of the admission of the patients to the emergency department is summarized in Table 1. In this respect, 28.1% (n=21) of the patients admitted 1 time, 16% (n=12) 3 times, and 14.7% (n=11) admitted twice. When the relation between the frequency of admission and the effect of existing symptoms was evaluated, there were no negative or positive correlations (>.05).

The types of cancer according to the symptoms of the admission of the patients are given in Table 3. When evaluated, it was found that pain symptoms were common admission symptoms of cancer types of the entire group of patients with 73.3% (n=13) in lung cancer patients, 66.7% (n=12) in breast cancer, 75% (n=7) in prostate cancer patients. The difference of the pain symptom between the cancer groups was not found to be statistically significant (=.806, p=.977). When the cancer types of the patients admitting to the emergency department with dyspnea symptoms were evaluated, as shown in Table 3, 61.1% (n=11) had lung ca, 22.2% (n=4) had breast ca, 16.7% (n=3) had prostate ca. The difference in inter-group dyspnea complaints in terms of cancer types was found to be statistically significant (14.240; p=0.07). Hemoptysis symptoms were present in 6.4% (n=5) of the patients, and were only seen in lung cancer patients. In our study, 12% of the patient population with gastrointestinal cancer presented to the emergency department with different symptoms. While 15.9% (n=9) of cancer patients who applied to the emergency department with pain symptoms had gastrointestinal cancer, 29.6% (n=8) of patients who presented with nausea and vomiting had gastrointestinal cancer. Depending on the patient population in our study, 33% (n = 3) of patients with gastrointestinal malignancies had Melena symptoms.

Table 2. Distribution of Patients by Gender Factor

	Female	**Male**	P value
Cancer Type			<0.05*
Brain cancer%(n)	2.3(1)	9.7(3)	
Lung cancer	35.5(9)	20.9(11)	
Gastrointestinal cancer	9.3(5)	16.1(4)	
Prostate cancer	-		
		35.4(11)	
Breast cancer	30.2(8)	-	
Age	54.23±10.7	64.58±10.6	<0.01*
Symptoms			
Pain	56.1(25)	43.9(32)	0.575
Shortness of breath	46.2(12)	53.8(14)	0.648
Oral intake disorder	45.4(10)	54.6(12)	0.117
Dysuria	33.3(3)	66.7(6)	0.026*
Hematuria	11.1(1)	88.9(8)	0.020*
Nausea and vomiting	63(17)	37(10)	0.114

Fisher's Exact Test were used. The results were evaluated for a significance level of p < 0.05(*). The "-" sign could not be made statistically for the small number of group.

On the other hand, 75% (n = 3) of the patients who developed symptoms due to brain tumor presented to the emergency department with epileptic seizures.

Hematuria %10.6(n=8) and dysuria%12(n=9) symptoms are more common in prostate cancer patients, and were found to be significantly higher compared to other cancer types (12.831; p=.005) (23.610; p=.001). Although 63% (n=16) of the patients who admitted to the Emergency Department with nausea-vomiting symptoms had post-chemotherapy complaints, 37% (n=9) showed these symptoms related to their current diseases, independent from their cancer treatments. The increase in this symptom after the treatment was also found to be statistically significant between the groups (Fisher: 0.022; p=.012). Moderate and positive correlation was detected between nausea-vomiting and emergency department symptom chemotherapy (rs:.583; p=.004). Oral intake disorder was present in 30% (n=22) of the patients; and no significant differences were detected between the patients when compared to the symptoms of oral intake disorder (x2:14.046; p=.221).

In the laboratory examinations of the patients, the most commonly detected hematological problem was anemia ((38.7% (n=29) % for below Hb:10 g/dl). A total of 2.6% (n=2) patients had neutropenia in laboratory parameters. These two patients were receiving Chemotherapy. In biochemical examinations, the most common abnormalities were urea/creatinine elevation (57/60%), and hyponatremia (117) in 1.3% (n=1) patients

Table 3. The types of cancer according to the symptoms of the admission of the patients

Cancer type	Lung(n)	Prostate(n)	Breast(n)	Liver(n)	Pancreas(n)	Stomach(n)	Colon(n)	Brain(n)	P value
Symptoms									
Pain	13	7	16	3	1	2	3	2	0.977
Shortness of breath	16	4	6	-	-	-	-	-	0.007*
Oral intake disorder	2	4	5	3	1	2	3	-	0.221
Melena	-	-	-	-	-	1	2	-	-
Nausea and vomiting	7	5	4	3	1	2	2	1	0.298
Epileptic seizures	-	-	-	-	-	-	-	3	-
Loss of consciousness	-	-	-	1	-	-	-	2	-
Hemoptysis	5	-	-	-	-	-	-	-	-
Dysuria	2	5	1	-	-	-	-	1	0.001*

The Chi-Square (χ^2) Test or Fisher's Exact Test were used. The results were evaluated for a significance level of $p < 0.05$. The "-" sign could not be made statistically for the small number of groups..

DISCUSSION

Cancer is increasingly important in the world, and remains as one of the important health problems in our country. Prolonged life expectancy, and depending on this, the increase in chronic diseases, such as cancer, improvements in diagnosis and treatment protocols increase the frequency of admissions to emergency departments (Barbera et al., 2010). Emergency departments should decrease malignancy-related symptoms, management of side effects associated with treatment, treatment of oncological emergencies and accompanying diseases in this group of patients (Mayer et al,2011; Guddati et al.,2013). Yaylaci et al (2009) in their study, they also reported that cancer patients' emergency service applications are too high to be ignored (Yaylaci et al., 2009). However,

Koçak et al (2012), in the study they reported, they talk about the data of 100 patients in the 3-month period within the scope of the research (Kocak et al., 2012). We think that the reason why the rate of oncology patients admitted to the emergency room in our study was lower than in these studies, is because our hospital does not have an oncology department and because oncology patients prefer the emergency departments of hospitals where they are treated more frequently.

According to the results obtained in our study, there were more frequently admissions to our emergency department with symptoms, such as pain, dyspnea, weakness, oral intake disorder, nausea-vomiting. Female gender was found to be more in cancer patients admitting to the ED. However, the frequency of emergency departments is high for the male gender. When the symptoms were evaluated according to the gender, especially hematuria and dysuria were found to be significantly higher in the male gender, and symptoms, such as pain, dyspnea, and nausea-vomiting, which had a high frequency, did not differ between the genders. Regarding the increased rate of admissions, we believe that male patients have low tolerance to symptoms that develop, and might have lower tolerance limits.

In their study conducted in the USA, Rivera et al. reported that approximately 60% of patients admitted to the emergency department were scheduled for hospitalized treatment (Rivera et al., 2017). In our study, the group of patients who were scheduled for hospitalized treatment was approximately 40%. The difference in these rates might be because of the 3.5-fold more hospitalization of cancer patients than other patient groups in Rievera et al.'s study, especially because it was related to the patient population and insurance coverage in the healthcare system (Rivera et al., 2017). Also, Grewal et al. emphasized in their study that hospitalization rates were low, especially in emergency departments that did not have oncology units (Grewal et al., 2019). It is considered that the hospitalization rates of the patients were affected because there was no oncology unit in our study.

In the studies conducted in the light of the literature, the prevalence of pain was reported as 50% at different stages of cancer (Bonica, 1985; Posternak et al., 2016). Many guidelines were issued for the management of cancer pain (Greco et al., 2014). Despite these guidelines and the presence of opioids (the basis of moderate-to-severe cancer pain management), inadequate treatment is common (Fallon et al., 2018). In the study of Ayşe et al., They reported that pain was the most common symptom, as in our study (Neufeld et al., 2017). According to the results of our study, oncology patients most often admit to emergency departments with pain symptoms. We believe that there is a frequency of admissions to emergency departments in cancer patients, especially because pain management is inadequate. In the results of the present study, dyspnea complaints were high, especially in patients with lung cancer, as in patients with pulmonary metastasis. In the literature, Swenson et al. reported the type of cancer that was found more was lung cancer (Swenson et al., 1995). However, in some studies, it was emphasized that the symptom of shortness of breath was the most commonly developed clinical symptom in malignancy patients (Brookoff, 1996; Kocak et al., 2012). From the symptoms of our patients who were included in the present study, dyspnea ranked the second after pain, which supported previous studies. We believe that the pain symptom may have come to the forefront more because patients with respiratory difficulties continue to face it during the course of the disease, and in time, body toleration develops, and they try to overcome these symptoms with supportive devices that are often present at home.

According to the results of our study, patients have high admissions with nausea-vomiting symptoms, and especially the vast majority of the patients admitting with these complaints, chemotherapy is the reason, and some gastrointestinal cancer patients

have symptoms of nausea-vomiting more in addition to oral intake disorder. Approximately 70-80% of patients receiving chemotherapy experience nausea and/or vomiting. However, nausea and vomiting significantly affect the quality of life of the patients, and might cause poor compliance with advanced treatment (Aksu et al., 2013). In our study, nausea-vomiting symptoms were found to be associated with high levels of chemotherapy.

In oncological emergency admissions, the most frequent symptom in laboratory examinations is low hemoglobin (Brookoff, 1996). Anemia was the most common hematological disorder in the patients in our study. In previous studies conducted in the literature, the frequency of anemia is emphasized especially in oncology patients (Brookoff, 1996; Yaylacı et al., 2009). We believe that oral intake disorder, especially bleeding symptoms like in GIS, hematuria, bone metastasis, may trigger anemia in this group of patients. However, we also believe that neutropenia, which was less frequently encountered, and which was found to be proportionally low in our study, is also a side effect of chemotherapy.

In a multi-centered study in the literature, similar to our study, the importance of pain, shortness of breath and nausea symptoms was emphasized for cancer patients (Caterino et al., 2019). As the subject of our study was cancer disease, which is a chronic disease, affecting all body mechanisms, patients' vital activities decrease due to pain, shortness of breath, nausea-vomiting, and common symptoms in all cancer types. There might be a need to regulate the pretreatment protocols of these patients to increase the life activities and facilitate cancer-related emergency department use and emergency care.

Limitation

There are some limitations in the present study. Firstly, the low number of patients because of the lack of a university research hospital and no oncology department as the study area. Also, the preferences of this group of patients were to contact the emergency departments of the hospitals where they were primarily followed-up unless very urgent situations develop. Another limitation was inherent in the dataset. Firstly, if a patient with a history of cancer admits to the emergency department, and malignant neoplasm diagnosis is not documented according to ICD-10, this patient is not included in the study group.

Conclusion

In today's conditions, the quality of life of patients with increased malignancies is reduced because of the cancer disease and treatment protocols. For this reason, repetitive emergency department admissions are increasing. We believe that specific units can be opened in emergency medicine clinics in cooperation with oncology specialists for this patient group in the future because of the discomfort in which the disease is reflected in the body, and due to the side effects that occur during treatment, which will contribute to the determination of special approach policies in emergency department planning.

Conflict of interest

The authors declare that there is no conflict of interest.

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