



Retrospective analysis of inpatients' demographic and clinical characteristics at medical oncology service: A single-center experience

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Abstract

The cancer registry is a continuous, systematic process of collecting data on the occurrence and characteristics of reportable neoplasms to assess and control malignancies' impact on the population. It helps public health professionals understand the dynamics of cancer incidences so that they can formulate strategies. To contribute to the cancer incidence studies in our region, we aimed to define the demographic and clinical characteristics of patients who had been hospitalised at Ondokuz Mayıs University Medical Faculty Hospital Oncology Service between 2018 and 2019. This retrospective, descriptive study's participants comprised cancer patients over 18 years of age who had been admitted to the service and referred to our faculty's medical oncology department. In this study, 519 applicants who had been hospitalised by the service were evaluated. The data of 385 patients, 134 of whose hospitalisations had been repeated, were examined. Of these 385 patients, 226 (58.7%) were male and 159 (41.3%) were female. Their mean age was 59.74 ± 12.74 (21.0–86.0). The most common reason for their admission was palliative care (153 patients; 29.5%), infection (67; 12.9%) and treatment maintenance (65; 12.5%). Lung cancer was found to be the most common cancer type (21.0%), followed by gastric cancer (12.5%) and breast cancer (11.7%). The majority of this study's patients had been admitted to the medical oncology service with advanced metastatic disease requiring palliative support. Preparing algorithms through a multidisciplinary approach and determining the order of referrals between units will increase the quality of life for patients and their caregivers. Therefore, patient follow-up and care quality will increase when the frequency of hospitalisations and applications that exceed tertiary services' and outpatient clinics' capacities are reduced.

Keywords: cancer, clinical features, demographic features, oncology

1. Introduction

As they are in the rest of the world, chronic diseases are increasing in Turkey. Per the National Burden of Disease and Cost-Effectiveness Study's results, cancer is an important public health problem since it is the second-most-common cause of known death, after cardiovascular diseases, in Turkey (1). According to Global Cancer Observatory (GLOBOCAN) data, a total of 18.07 million new cancer cases developed while 9.5 million cancer-related deaths occurred globally in 2018 (2). The incidence of cancer has increased significantly due to prolonged life expectancies, advances in diagnosis and treatment and increased exposure to carcinogenic substances (3). Globally, cancers cause approximately 12% of all deaths. In developed countries, cancer is the second leading cause of death, accounting for 21% of deaths; in developing countries, it is the third, accounting for 9.5% of deaths (4).

Given studies' inadequacy in describing the characteristics of patients who have been hospitalised by oncology services, the current study aimed to define inpatients' demographic and clinical characteristics at Ondokuz Mayıs University Medical Faculty Hospital Oncology Service.

2. Material and Methods

Approval for this retrospective study was obtained from the

Non-Interventional Ethics Committee of Samsun Ondokuz Mayıs University. The study's participants comprised cancer patients who were over the age of 18, had followed up with our faculty's medical oncology department and had been admitted to the oncology service between 1 January 2018 and 1 January 2019. Data regarding patients' demographic and clinical characteristics were obtained from the hospital's electronic database and patients' files. Patients' age, gender, cancer-affected organ and pathology type, date of diagnosis, presence of metastasis, reason for admission, hospitalisation laboratory results, time of admission, length of stay at the service (days), hospitalisation status and end-of-service hospitalisation were included in the data, which were collected through forms prepared in Excel.

2.1. Statistical analysis

The SPSS (Version 22.0, SPSS Inc.) program was used to statistically evaluate this study's data. Continuous variables were expressed as means \pm standard deviations (SDs), medians and lowest-maximum values (minimum–maximum), while countable data were expressed using numbers and percentages (%). The variables' suitability for normal distribution in statistical analyses was evaluated with the Kolmogorov–Smirnov test. While descriptive analyses were expressed in the

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study, variables suitable for normal distribution were specified using arithmetic means \pm SDs, and variables that did not conform to normal distribution were specified using median (minimum–maximum) values. When continuous variables were compared between independent groups, those that did not fit the normal distribution were evaluated with the Mann–Whitney U test. Pearson’s chi-square test was used to evaluate categorical data. Statistical significance was accepted at $p < 0.05$ for all tests.

3. Results

In our study, 519 applicants who had been hospitalised with the oncology service between January 1 2018 and January 1 2019 were evaluated. The data of 385 patients, who had been hospitalised at least once and for whom 134 hospitalisations were repeated, were analysed. Within this study period, 694 patients had with consulted with the medical oncology department from our hospital’s emergency department. During this time, 5,981 patients had presented at our hospital’s oncology outpatient clinic, submitting a total of 24,688 presentations. Of the 385 patients included in the study group, 58.7% were male and 41.3% were female. Their mean age was 59.74 ± 12.74 (21.0–86.0). Meanwhile, the male patients’ mean age was 61.62 ± 12.53 , which was higher than the female patients’ mean age (57.07 ± 12.59), representing a statistically significant difference ($p < 0.0001$).

When hospitalised participants at the oncology service were examined on a patient basis, 286 patients were found to have been hospitalised once, and 99 patients had experienced repeated hospitalisations. The mean stay length for the total

519 hospitalisations was 13.49 ± 14.00 . Given patients’ distribution by application place, 43.5% of the total hospitalisations were found to have occurred for outpatients (via an outpatient clinic or appointment system), versus 48.8% from the emergency department and 7.7% from other services (Table 1). The most common reason for admission was determined to be palliative care for 29.5% of hospitalisations, infection for 12.9% and treatment maintenance for 12.5%. Among the patients who had been hospitalised at least once, the most common reason for admission and hospitalisation was palliative care, at 20.4%, followed by maintenance or newly diagnosed treatment planning and initiation at 9.4% and febrile neutropenia at 9.2%. The reasons for readmission and repeated hospitalisation were most commonly palliative care at 9.1%. Meanwhile, the bleeding, malignant hypercalcaemia, tumour lysis, VCSS (vena cava superior syndrome), gastrointestinal obstruction, convulsion, spinal cord compression, interventional procedure and examination reasons were categorised as ‘other’ (Table 2).

Table 1. Distribution of patients by place of application.

Variables		Total hospitalizations (519)	
		n	%
Distribution of hospitalizations	Emergency	253	48.8
	Outpatient Clinic	226	43.5
	Transfer	40	7.7
	Total	519	100.0

Table 2. Distribution of patients according to the reason for admission requiring at least one and repeated hospitalizations

Variables		Total hospitalizations (519)		At least one hospitalization (385)		Repeated hospitalizations (134)	
		n	%	n	%	n	%
Reason for application	Palliative	153	29.5	106	20.4	48	9.1
	Infection	67	12.9	47	9.0	20	3.9
	Maintenance of treatment	65	12.5	49	9.4	16	3.1
	Febrile neutropenia	59	11.3	48	9.2	11	2.1
	Acut renal failure	30	5.8	23	4.4	7	1.4
	Pleural/pericardial effusion	23	4.4	19	3.6	3	0.8
	Other	122	23.6	93	18.2	29	5.4
	Total	519	100.0	385	74.2	134	25.8

For 376 of the 519 hospitalisations, Eastern Cooperative Oncology Group (ECOG) data could be accessed. Among the ECOG scores, ECOG 4 was the most common at 34.5%, while ECOG 3 followed at 24.4% for patients who had been hospitalised at least once, and ECOG 4 was the most common for patients who had experienced repeated hospitalisations at

12.2%. The relationship and distribution between hospitalizations and stages are indicated in Table 3. When the distribution of 134 patients who had experienced repeated hospitalisations was examined by cancer stage, the patients who had undergone repeated hospitalisations were found to have the most advanced stages.

Table 3. The relationship and distribution between at least one and repeated hospitalizations of patients and their stages during hospitalization

Variables		Total hospitalizations (519)		At least one hospitalization (385)		Repeated hospitalizations (134)	
		n	%	n	%	n	%
Stage	Stage 1	11	2.2	8	1.6	3	0.6
	Stage 2	32	6.4	22	4.4	10	2
	Stage 3	74	15	53	10.7	21	3.1
	Stage 4	376	76.2	279	56.5	97	19.7
	Total	493	100	362	73.4	131	26.6

Of patients, 76.5% were determined to have been discharged from hospitalisation, and hospitalisation resulted in death for 17.5% of patients (Table 4). The cancer type distribution of the study's 385 patients revealed that 11.7% of female patients had been diagnosed with breast cancer, followed by gastric cancer (4.9%) and ovarian cancer (3.6%). Lung cancer was the most common cancer type for male

Table 4. The distribution of the patients' end-of-hospitalization status.

Variables		Total hospitalizations (519)		At least one hospitalization (385)		Repeated hospitalizations (134)	
		N	%	n	%	n	%
End of hospitalization status	Discharge	397	76.5	296	57	101	19.5
	Exitus	91	17.5	63	12.1	28	5.4
	Transfer	31	6.0	26	5.0	5	1.0

Table 5. Distribution of hospitalized patients by gender and region of diagnosis

Variables		385 people		Female		Male	
		n	%	n	%	%	n
Location	Pulmonary	81	21.0	9	2.3	18.8	72
	Gastric	48	12.5	19	4.9	7.6	29
	Breast	45	11.7	45	11.7	0.0	0
	Pancreas	31	8.1	12	3.1	4.9	19
	Colon / Rectum	25	6.5	11	2.9	3.6	14
	Prostate	19	4.9	0	0.0	4.9	19
	Bladder	17	4.4	4	1.0	3.4	13
	Ovary	14	3.6	14	3.6	0.0	0
	No diagnosis	10	2.6	2	0.5	2.1	8
	Other	95	24.7	42	11.1	13.6	53
	Total	385	100	158	41.1	58.9	226

4. Discussion

Cancer is an important, increasing health problem worldwide, and it remains among the leading causes of death despite improvements in cancer management. Prolonged life expectancies, thanks to early diagnosis and new treatments, have increased the number of cancer patients applying to hospital outpatient clinics and emergency services. In our study, we defined the sociodemographic characteristics of patients hospitalised at a medical oncology service in the Middle Black Sea Region, examining their reasons for hospitalisation, laboratory values, diagnosis and pathology dates, treatment type and duration, and their metastasis and post-hospitalisation status. We aimed to contribute to the epidemiological cancer studies in our region and guide physicians' future activities and plans by reviewing hospitalised patients' retrospective data. Thus, inappropriate practices can be corrected by revealing societal and professional habits concerning inpatient treatment. Additionally, our findings will help apply newly developed treatment methods and reveal which conditions require hospitalisation due to their side effects.

Our university hospital is an important oncology clinic not only for Samsun but also for its surrounding provinces. In our study, we examined 519 admissions to the oncology service between January 1 2018 and January 1 2019, finding that admitted patients were evaluated, and their follow-up and treatment conditions resulted in discharge, transfer or death. The most common reason for admission was palliative care (153 patients; 29.5%), which reveals the importance and need for palliative patient care centres. While the incidence of cancer in Turkey surpasses the global incidence for men, it is somewhat lower for women. According to SEER (Surveillance, Epidemiology, and End Results) data published in 2019 (5), new cancer cases totalled 481 for men and 417 for women per 100,000 cases per year, compared to the 2012–2016 cases. Overall cancer incidence rates are higher for men than women. Awad et al. (6) found that the male-to-female incidence ratio of 1.5:1. Meanwhile, Bozdemir et al. (7) found that 49.5% of cancer patients were male and 49.7% were female. In our study, 226 of 385 patients (58.7%) were male and 159 (41.3%) were female. Thus, the high male population in our study was consistent with previous studies.

Additionally, 26.1% of hospitalised patients in our study had been admitted repeatedly. In the literature, studies that retrospectively evaluated cancer patients who had presented at an emergency department found that 56% of applications were repeated admissions (5). Cancer patients who followed up at our hospital had experienced repeated hospitalisations, up to seven within a year, and a significant majority had advanced-stage, metastatic and palliative care needs. This finding suggests that appropriate, standardised palliative care will reduce the tertiary emergency and oncology services' workloads.

According to IARC data, the three most common cancer types in the world are lung, prostate and colorectal cancer for men, versus while breast, colorectal and lung cancer for women (9). The Ministry of Health Cancer Statistics 2017 report, published with data from the Turkey Unified Database in 2014, found that Turkey's cancer incidence for men of all age groups was 21.1% for trachea, bronchi and lung cancers, versus 12.7% for prostate cancer. For women, breast cancer is the most common, at a rate of 24.9%, while thyroid cancer is the second-most common at 12% (10). Kocak et al. (11) found that the three most common cancers were lung 30%, gastric 11% and breast cancer 11%, respectively. In our study, lung cancer (21.0%) was the most common, followed by gastric cancer (12.5%) and breast cancer (11.7%). We found that breast cancer was the most common among female patients, affecting 45 of 158 female patients (11.7%), followed by gastric cancer for 19 patients (4.9%) and ovarian cancer for 14 patients (3.6%). Of our 226 male patients, the most common cancer was lung cancer (72 patients; 18.8%), followed by gastric cancer for 29 patients (7.6%), prostate cancer for 19 patients (4.9%) and pancreatic cancer for 19 patients (4.9%). Thus, the prevalence of cancer types among women and men of all age groups in our study aligned with the literature.

Cancer patients' hospital presentations are increasing for many reasons, such as the development of early diagnosis opportunities, the increase in the elderly population, prolonged life expectancies due to new treatment methods and the side effects during treatment. In a previous study on cancer patients, the most common reasons for cancer patients to present at an emergency room or hospital in the previous six months were pain, confusion and decreased functional capacity (3). Bozdemir et al. (12) found that 245 patients sought readmission of a total of 24,903 patient applications in a six-month period; when the reasons for these recurrent admissions were examined, patients were found to have presented with complaints of pain and nausea or vomiting.

Erdem et al. (13) examined the most common causes of emergency admission, identifying pain at 28.7%, respiratory complaints at 19.7% and GIS (gastrointestinal system) complaints at 18.3%. In our study, the most common reason for 519 admissions was palliative care (29.5%), followed by infection (12.9%) and treatment maintenance (12.5%). Conditions such as nausea, vomiting, pain, poor oral intake and poor performance were categorised as needing 'palliative care' in our study. In the literature and similar studies, researchers have observed that the most common reasons for cancer patients to present to a hospital are nausea, vomiting, pain and shortness of breath. At our clinic, the most common causes for hospitalisation were treatment maintenance, new diagnoses and treatment planning due to our clinic's status as a central, oncological hospital in the Middle Black Sea Region; therefore, many patients are accepted from the surrounding provinces and districts. The hospitalisation of patients from surrounding areas is mandatory due to transportation problems

in chemotherapy protocols, which increases the clinic's number of inpatients seeking treatment.

Additional factors that affect oncology patients' hospitalisation are their stage of cancer diagnosis and the presence of metastasis (14). The main goal of cancer treatments is to prevent disease recurrence during the early stages, stop disease progression and – most importantly – relieve symptoms to increase patients' quality of life (15). In our study, the diagnosis stages of patients who had been hospitalised at least once and patients who had undergone repeated hospitalisations were examined; the majority of these patients had Stage 4 cancer during hospitalisation. Similar to our finding, another study found the majority of hospitalised cancer patients to have Stage 4 cancer (16). Evidently, the hospitalisation rates of patients with advanced cancer stages or metastases are significantly high due to both acute primary-disease complications and palliation problems, such as pain and nutrition. The hospital admissions and hospitalisations of patients with metastatic disease have been found to have increased significantly. Oncology patients' palliative admissions and hospitalisations are thought to be reducible by standardising follow-up and care for patients with metastases carefully at oncological outpatient clinics, algological outpatient clinics and palliative centres when necessary. Therefore, advanced cancer stages, metastasis status and performance status should be important prognostic markers in patient management for clinical departments involved in following up with, treating and caring for patients.

The presence of secondary disease among cancer patients affects their treatment and its effectiveness, as well as their survival (17). In our medical-oncology-service-centred study, patients' additional diseases were found to include hypertension (16.1%), diabetes mellitus (13.5%), cardiovascular diseases (8.1%) and COPD (chronic obstructive pulmonary disease) (5.2%). The number of patients with second malignancies that had been diagnosed in addition to their previous cancer diagnoses was 32 (8.3%). A report addressing diseases that accompany cancer (18) noted that the most common comorbidities were hypertension, diabetes and cardiovascular diseases, as we found in the current study. According to a report on the TEKHARF (2017) study in Turkey, cardiovascular diseases – such as obesity, diabetes and hypertension – and hyperlipidaemia are common in the total population (19). Thus, comorbid diseases play an important role in increasing the need for cancer patients' inpatient treatment.

In our study, we categorised patients' outcomes as 'discharge', 'death' and 'transfer to the intensive care unit'. We determined that 397 (76.5%) of hospitalisations resulted in discharge and 91 (17.5%) resulted in death. Swenson et al. (20) observed a 10% mortality rate in their study. By contrast, Swenson et al. (20) found that 77.8% of patients were discharged, while 18.6% died. Kocak et al. (11) observed that

35% of patients were discharged, while 19% died. Thus, oncology patients experience similar hospital mortality rates across similar studies.

As we determined in the current study, which defined the demographic and clinical characteristics of patients who had been hospitalised by our oncology service, the majority of hospitalisations were experienced by patients with advanced metastatic disease and low performance scores, and recurrent hospitalisations occurred. Therefore, cooperation between staff members at medical oncology, radiation oncology and related surgical clinics, algology clinics, psychiatry clinics, emergency and palliative centres and home-care services units, as well as dietitians, could encourage the dissemination of palliative care centres to provide easier access and more active, effective home-care services. The effective operation and implementation of necessary arrangements for patient care homes will increase the health system's efficient use of human and financial resources and the quality of diagnosis, follow-up and care for oncology patients.

Conflict of interest

The authors have no relevant affiliations or financial involvement with any organization or entity with a financial interest in or financial conflict with the subject matter or materials discussed in the manuscript.

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Authors' contributions

Concept: B.Y., Design: G.G.G., B.Y., Data Collection or Processing: G.G.G., Analysis or Interpretation: G.G.G., B.Y., Literature Search: G.G.G., Writing: G.G.G., B.Y.

Ethical Statement

Approval was obtained from Ondokuz Mayıs University Clinical Research Ethics Committee, the study started. The ethics committee decision date is 11/07/2019 and the number of ethical committee decisions is 2019/545.

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