

RESEARCH ARTICLE

Single Center Experience on Causes of Cancer Patients Visiting the Emergency Department in Southwest Turkey

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Abstract

Background: Emergency departments are visited by cancer patients for palliation of cancer-related symptoms, management of treatment-related side effects, oncologic emergencies, co-morbidities, and/or end of life care. In this study, we aimed to identify the characteristics of cancer patients admitted to an emergency medicine department in Southwest Turkey. **Materials and Methods:** In this retrospective descriptive study, a total of 304 emergency department admissions of 102 patients with cancer due to medical conditions were evaluated. Descriptive statistical methods, statistical analysis for correlation, Student's t-test, chi-square tests and logistic regression test were used. **Results:** The majority of patients visiting to emergency departments were male (n=66, 65%) and over 65 years of age (53, 52%). Some 30% (n=31) had a lung cancer diagnosis, 32% (n=33) presentation with dyspnea, 53% (n=55) with metastasis, 30% (n=16) with multiple metastatic lesions in lung, and 68% (n=70) had a poor ECOG performance status (score 3 to 4). **Conclusions:** Emergency departments have valuable roles in managing and caring for patients with malignancies.

Keywords: Cancer patients - emergency service - palliative care - lung cancer

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Introduction

Although the developments in its medical and surgical treatments modalities, cancer is a most common health and public problem in today. Cancer patients often face with oncological or general emergencies and unexpected life-threatening due to deteriorated medical conditions (Yates and Barrett, 2009; Mayer et al., 2011; Ahn et al., 2012; Yucel et al., 2012). Emergency departments (ED) are often visited by cancer patients for palliation of cancer-related symptoms, management of treatment-related side effects, oncologic emergencies, co-morbidities, and/or end of life care (EOLC) (Barbera et al., 2010, Guddati et al., 2013).

To interfere with a multidisciplinary approaches to cancer patients in ED is a most ideally. In this study, we aimed to identify the characteristics of cancer patients admitted to the emergency medicine in Southwest Turkey.

Materials and Methods

This study has been planned as a descriptive and retrospectively study which aims to identifying the features of admission of cancer patients to ED in Southwest Turkey. It was conducted at an ED associated with a education hospital in Mugla province. Our hospital serves a population of a quarter million with the surrounding districts, but is an increase in population during the summer months due to tourism.

We excluded patients for who were younger than 18 years of age, who diagnosis with hematological malignancies, and patients whom clinical information could not been reached at the statistical analyses.

A total of 304 emergency department admissions of 102 cancer patients between August 2011 and September 2013. whose medical file information was complete and who did not meet the exclusion criteria were enrolled in this study.

For type of malignancy recorded as the cause of admissions for each patient, we used the International Classification of Diseases (ICD)-10 codes for Turkey. Patients visits made to the our ED were determined by special files of Department of Medical Oncology, records of home care unit, hospital automation system, and Death Notification System of the Ministry of Health.

Ethics

The protocol for this retrospective study was compatible with the local ethical guidelines. The study was approved by the Academic Committees of our institution.

Statistical analyses

The data are expressed as the mean±standard deviation or the median and interquartile range (25-75%). The distribution of variables was analysed with the Kolmogorov-Smirnov test. Quantitative variables with normal distributions were analysed with a two-tailed,

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independent Student's test. Nonparametric variables were analysed with the Mann-Whitney U test. However, qualitative parameters were analysed with the Chi-square test and Fisher's test.

The relationships between the presence of ED visits and other study variables were determined using Spearman's correlation tests and analysis of variance (ANOVA). Additionally, the relationships between clinical and demographic variables (such as age, sex, smoking habits, weight loss, tumour location, stage of cancer, performance status by Eastern Cooperative Oncology Group-ECOG, co-morbidities, agents of pain palliation, treatment options for malignancy, treatment-related toxicity, localization of metastatic lesions, oncologic emergencies, cancer-related symptoms) and the presence of ED visits were determined using a Pearson correlation test. The dependent variable for the multiple logistic regression analysis was the presence of ED visits. Both the adjusted and crude odds ratios (ORs) were calculated with 95% confidence intervals (95%CI) to assess the influences of various independent variables on the presence of ED

visits.

A significance value of $p < 0.05$ was accepted as statistically significant. All of the analyses were performed using the Statistical Program for Social Sciences (SPSS) version 15.

Results

The demographic and clinical characteristics of patients who were median age 62 years (range 42-86 in this study) are displayed in Table 1.

In study group, of those who admission to the ED from August 2011 to September 2013, 18% (n=18) made one visit, 44% (n=44) made two, 19% (n=19) made three, 11% (n=11) made four, and 8% (n=8) made five or more. In this study group, the most common site of primary tumor were the lung (n=31, 30%), colon-rectum (n=17, 17%), and breast (n=16, 17%) (Table 1). The most common symptoms and signs for apply to the ED in patients are listed in Table 2. All of patients, 53% (n=54) were discharged, 8% (n=8) died in the ED, 26% (n=28)

Table 1. Characteristics of Cancer Patients in Emergency Service (n=102)

Features	n	%	Features	n	%		
Gender	Female	36	35	ECOG Performance status	0 and 1	4	4
	Male	66	65		2	28	28
Age	≤65	49	48		3	34	33
	>65	53	52		4	36	35
Marital status	Married	52	51	Treatment options			
	Other	50	49	Adjuvant systemic chemotherapy		8	8
Employment	Employment	25	25	Adjuvant radiotherapy		3	2
	Unemployment	77	75	Orally or parenteral palliative chemotherapy		25	25
Education	High school or greater	36	35	Targeted molecular palliative treatment		11	11
	Other	66	65	Palliative endocrine treatment		4	3
Economic status	High level	24	24	Best supportive care		51	51
	Low level	78	76	No. of the visit to emergency service	1	18	18
Living area	Urban	46	45		2	44	44
	Rural	56	55		3	19	19
Causes of emergency admissions					4	11	11
Chemotherapy-related symptoms/findings		38	37		>5	8	8
Co-morbidities		8	8	Immediate outcome	Discharge	54	53
Cancer related symptoms/Oncological emergencies		56	55		Death in the emergency service	8	8
Arrival at the emergency service					Transferring for other center	12	13
Ambulance		43	42		Hospitalization	28	26
Other transportation or themselves		59	58	Place of hospitalization (n=28)			
Tumour localization	Lung	31	30	Clinic of Medical Oncology		12	43
	Colon-rectum	17	17	Clinic of Pulmonary Diseases		7	25
	Breast	16	15	Clinic of Infection Diseases		2	7
	Pancreaticobiliary	9	9	Clinic of Toracic Surgery		1	4
	Gynecological	8	8	Clinic of Surgery or Urology		2	7
	Stomach	5	5	Clinic of General Medicine		3	10
	Bladder	4	4	Intensive Care/Coronary Care Unit		1	4
	Prostate	4	4	Indications of hospitalization (n=28)			
	Brain	2	2	Pneumonia or COPD		5	19
	Head-neck	2	2	Desorientation of general status		4	14
	Melanoma	1	1	Pain palliation		4	14
	Unknown primary	1	1	Chemotherapy-related anemia		4	14
	Sarcoma/Other**	2	2	Febrile neutropenia		3	11
Stage of Cancer	Early-stage disease	8	8	Ileus/subileus		2	7
	Locoregional disease	39	39	Haemoptysis		2	7
	Metastatic disease	55	53	Massive pleural effusion		2	7
Localization of metastatic lesions (n=53)				Bleeding from GIS/gynecological area		2	7
Isolated lung metastases		16	30	Duration of hospitalization (day) (n=28)			
Isolated liver metastases		8	15	7 and less		12	43
Isolated bone metastases		5	9	>7		16	57
Isolated brain metastases		4	7	Events			
Multipl metastases (bone and other)		13	24	Death in the emergency service		8	8
Multipl metastases (brain and other)		7	15	Death during hospitalization		16	16

*COPD Chronic obstructive pulmonary disease; GIS Gastrointestinal system; **(Gastrointestinal stromal tumor etc.)

Table 2. Main Symptoms or Signs of Cancer Patients in Emergency Service

Features	n	%
Symptoms or signs of admission*		
Dyspnea/Shortness of breath	33	32
Pain (Excepted abdominal pain)	19	19
Detoriantation in general health status	12	12
Fever	10	10
Nausea and Vomiting	9	8
Fatigue	6	6
Diarrhea	4	4
Orally mucositis	2	2
Haemorrhage	2	2
Abdominal distention/Ascites	2	2
Icterus	1	1
Paralysis or plegia	1	1
Asymmetric limb edema (Deep venous thrombosis)	1	1

Table 3. Univariate Analyses of Visit to Emergency Service

Factors	Feature	p value*
Age (years)	≤65 vs ≥65 years	0.048*
Gender	Male vs Female	0.211
Smoking Habit	Absence vs Presence	0.174
Weight loss	≤65 vs ≥65 years	0.046*
Tumor location	Lung vs Colon-rectum vs other	0.034*
Stage of cancer	Metastatic vs Locoregional	0.039*
ECOG	≤2 vs ≥3	0.044*
Co-morbidities	Absence vs Presence	0.089
Pain treatment	Fentanyl vs Tramadol vs Morphine etc	0.204
Treatment options	Chemotherapy vs other	0.077
Chemotherapy related toxicities	Anemia vs other	0.048*
Localization of metastatic lesions	Lung vs other	0.044*
Oncological emergencies	Absence vs Presence	0.123
Cancer-related symptoms	Dyspnea vs Pleural effusion vs other	0.046*

*P: A two tailed p value of <0.05 was considered statistically significant

Table 4. Multivariate Analyses of Visit to Emergency Service

Factors	Odds ratio (95%CI)	p value*
Age (≤65 years vs. ≥65 years)	1.36 (0.43-4.4)	0.201
Weight loss (≤10 kg or ≥ 10 kg at last 3 months)	1.14 (0.98- 3.85)	0.178
Primary tumour localization (Lung vs. other)	3.52 (1.19-7.21)	0.036*
Stage (metastatic vs. locoregional)	2.41 (1.38-6.05)	0.048*
ECOG (≤1 or ≥2)	1.49 (0.94-3.35)	0.214
Localization of metastatic lesions (lung vs.other)	2.14 (1.79-5.47)	0.043*
Chemotherapy-related symptom (anemia vs. other)	1.97 (0.21-3.67)	0.107
Cancer-related symptom (Dyspnea vs. other)	1.44 (0.55-3.75)	0.212

*p: A two tailed p value of <0.05 was considered statistically significant

hospitalization, and 13% (n=12) were transferring to other oncological center via ambulance. Hospitalization places and causes of hospitalization are shown in Table 1.

In conclusion, majority of patients all of visits to emergency departments were 65% (n=66) male, 52% (n=53) over 65 years age, 30% (n=31) with lung cancer diagnosis, 32% (n=33) presentation with dyspnea, 53% (n=55) with metastatic stage, 30% (n=16) multiple metastatic lesions in lung, and 68% (n=70) worst ECOG performance status (score 3 to 4) (Table 1 and Table 2).

Visits to ED correlated significantly with tumour location (r=0.697; p=0.029), worst performance status (r=0.613; p=0.038), metastases to lung from solid tumors (r=0.625; p=0.034), presence of pleural effusion (r=0.643; p=0.031), chemotherapy-related anemia (r=0.567, p=0.043), disoriented medical conditions (r=0.604, p=0.038), and presence of pain (r=0.513; p=0.044) patients.

Thus, we concluded that the relationship between visits to ED and lung cancer, metastases to lung, and metastatic disease are independent from the other study variables (such as age, sex, smoking habits, weight loss, tumour location, stage of cancer, performance status by Eastern Cooperative Oncology Group-ECOG, co-morbidities, agents of pain palliation, treatment options for malignancy, treatment-related toxicity, localization of metastatic lesions, oncologic emergencies, cancer-related symptoms) (Table 3 and Table 4).

Discussion

Our study showed that a significant proportion of cancer patients many repeated visits to ED. Indeed, previous studies reported that rate of cancer patients for

emergency service admissions was 12.5 to 15% (Mayer et al., 2012). Additionally, lung was most common primary and metastatic tumor site and dyspnea, pleural effusion and pain were common symptoms for repeated visits to ED in our study.

Emergency services are most important places for oncology patients. Although cancer is a chronic disease, patients with cancer often visit to ED because life-threatening emergencies and unexpected side effects associated with cancer or treatment. Previous studies reported that lung cancer and advanced disease were most common causes of ED admissions of cancer (Rosenwax et al., 2011; Kraft-Rovere et al., 2012; Wallace et al., 2012; Gorham et al., 2013). Our study also showed similar results with previously studies. Shortness of breath and anxiety in patients with lung cancer may be the major cause of this ratio for ED admissions of lung cancer.

Previous studies in cancer patients admitted to the ED more often found to the female gender, in our study, the majority of patients were male (Bozdemir et al., 2009; Mayer et al., 2011; Yucel et al., 2012; Barbera et al., 2013). This situation can be explained by the fact that men outnumber patients with lung cancer in our study. In addition, the only one hospital and lack of special hospital of pulmonary disease in our city to serve may be the another cause of this condition.

Previous studies have shown applied to the emergency room with the most common cause of pain approximately in 34% of the patients (Swenson et al., 1995; Escalente et al., 2008; Bozdemir et al., 2009). It keeps track of nausea, vomiting and shortness of breath, respectively (Bozdemir et al., 2009; Yates and Barrett, 2010; Mayer et al., 2011; Kraft-Rovere et al., 2012; Yucel et al., 2012). In our study,

the majority of symptoms of shortness of breath. Similarly, this may be related to the incidence of primary lung cancer and metastases to lung from solid tumors.

In our study, the most common presenting reasons for the emergency department found that it was local compression of malign masses (to lung parenchyma or vessels, brain, bile duct, and spinal cord, respectively), infection and the end-of-life care (Bozdemir et al., 2009; Yates and Barrett, 2009; Mayer et al., 2011; Kraft-Rovere et al., 2012; Yucel et al., 2012; Barbera et al., 2013). These results are similar to previous studies. Deteriorated general health may be associated with hypoxia, electrolyte disorders, brain metastases, infection/sepsis, and eating disorders. We did not find sufficient data in the literature on this situation.

The frequency of patients who were hospitalized because of febrile neutropenia was 11%, whereas the rates of chemotherapy-related anemia was 14% (n=4) and thrombocytopenia was 5% (n=1). In this study, 7% of patients with suspected pulmonary embolism, definite diagnosis was 3% of all of patients. The frequency of nausea and vomiting associated with chemotherapy was 8% and this rate was lower than the literature data (Mayer et al., 2011; Yucel et al., 2012). The reason for this may be that these patients resort to the emergency room just for the weekend. Palliation of pain and chemotherapy-related nausea-vomiting by the oncologist is done at chemotherapy unit and this situation can reduce this rate. Similarly, previous studies have shown that treatment-related febrile neutropenia causes death in 4-30% of the patients. Our number of all patients is very small and its limitations our study for incidence of treatment-related complications.

Previous studies have found significantly higher than those without cancer, the rate of hospitalization for patients with cancer. The reason for this may create the danger life-threatening symptoms associated with cancer and its treatment (Mayer et al., 2011; Yucel et al., 2012; Barbera et al., 2013). Co-morbidity diseases and chemotherapy-related toxicities for lung, liver, kidney, and heart in acute symptomatic patients were part of a specific cause. This application can improve the emergency room.

With poor performance status established an important relationship between emergency department visits. In fact, the performance status of patients reduces pain, fatigue can increase this ratio of ED admissions such situations. Previous studies have shown poor prognostic factor in poor performance status reported that intra-hospital mortality (Bozcuk et al., 2004; Bozdemir et al., 2009; Yucel et al., 2012; Barbera et al., 2013).

In this study, 88% of patients admitted to the ED clinic were evaluated within first 5 days in the oncology outpatient clinic and in 6% of patients, cancer progression was determined by the oncologist. 2% of patients were discharged from the emergency department were hospitalized in the oncology outpatient clinic.

As a result, oncology patients need a multidisciplinary team that to work in harmony for well managed. Excluding the oncological treatment decisions, ED is an important part of this team in all other cases situations. Better symptom control and rapid diagnosis/therapy made by emergency team play an important role for reduce

mortality and increased quality-of-life in patients with cancer. We would like to draw attention to heterogeneity of cancer patients in the emergency department. It is a heterogeneous group of patients is important to guard against unexpected life-threatening situations concluded.

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