RESEARCH ARTICLE

Evaluation of Cancer Patients Admitted to the Emergency Department within One Month before Death in Turkey: What are the Problems Needing Attention?

Birdal Yildirim[1], Ozgur Tanriverdi[2]*

Abstract

Background: Although previously studies have reported that most patients with malignancy prefer to die at home, this is not the real situation in clinical practice. Aim: In this study, we aimed to determine the characteristics of Turkish cancer patients admitted to the emergency department (ED) within one month before death. Materials and Method: This descriptive retrospective study focused on questions about how often and why patients with cancer visited the ED before death. A total of 107 individuals with cancer were divided into 2 groups: Group 1, patients with at least one visit in the final 4 weeks; and Group 2, patients with no visit to ED. Demographic and clinical features were compared between the two groups. Statistical analyses: Descriptive statistical methods, statistical analysis for correlation, Student's t-test, chi-square tests and logistic regression were used. Results: At least one visit to ED within one month before death was reported for 64 (60%) of the 107 cases. Of these 64 (Group 1), 38% (n=24) were discharged and 9% (n=6) died in the ED. The most common site of the primary tumor was the lung (n=24, 38%) and the most common symptom was dyspnea (92%). With the other 43 (40%) cancer patients not presenting to the ED within one month before death, they were more likely to be female with another type of cancer. Conclusions: Guidelines are needed for better management of cancer patients benefiting from visits to ED within the last month of life .

Keywords: Cancer patients - emergency service - hospice - end of life - palliative care

Introduction

Today, cancer still continuous to be a major health problem, despite the developments in its treatment, and these patients often face with medical emergencies and unexpected life-threatening conditions (Yates and Barrett, 2009; Ahn et al., 2012; Yucel et al., 2012). Cancer patients are often admitted to emergency departments (ED) for palliation treatment 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, Ho et al., 2011; Guddati et al., 2013).

As Barbera et al. (2010) in their study on cancer patients and their visits to ED indicate that "Ideally, the symptoms of a patient near death would be adequately controlled and the patient would be cared for in the setting of his or her choice, rather than on an emergency basis." Similarly, previously studies have reported that most patients with malignancy prefer to die at home (Bruera et al., 2002; Earle et al., 2003). But this is not the real situation in clinical practice. A few studies have shown that 36% of cancer patients died in a hospital and 8% of

their died in an intensive care unit (ICU) (Angus et al., 2004; Wright et al., 2010). In additionally, Barbera et al. (2010) have indicated that about 40% of patients with cancer visited to ED during the final two weeks of life.

What is the importance of ED on management of patients with cancer? Which of patients admitted to the ED before death? Why do patients with malignancy apply the ED near the end of life (EOL)? In this study, we aimed to determine the characteristics of cancer patients admitted to the ED within one month before death.

Materials and Methods

This study has been planned as a descriptive and retrospectively study which aims to looking for answer to question about how often and why patients with cancer visited the ED before death in Turkey. It was conducted at an ED associated with a education hospital in south-west of Turkey, as Mugla province.

The subjects of this study were selected from 641 patients with cancer treated or followed at the Department of Medical Oncology of our institution between August 2011 and September 2013.

*[1] Department of Emergency Medicine, Education and Research Hospital,[2]Department of Medical Oncology, Faculty of Medicine, Mugla Sitki Kocman University, Mugla, Turkey *For correspondence: mugla.medicaloncology@gmail.com*

We excluded patients for who were younger than 18 years of age, who died outside of Mugla province and its districts, whose deaths occurred within 30 days of a major cancer-related operation, and patients whom clinical information could not been reached at the time of death.

A total of 107 decedents with cancer whose medical file information was complete and who did not meet the exclusion criteria were enrolled in this study. Then, the subjects were divided into 2 groups according to visit status to ED within one month before death: as Group 1, patients with at least once visit in final 4 weeks and Group 2, patients with no visit to ED in final 4 weeks.

For type of malignancy recorded as the cause of death for each decedent, we used the International Classification of Diseased (ICD)-10 codes for Turkey. Patients visits made to the our ED during the final four weeks of life 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, 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, chemotherapy, 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

Least one visit to ED within one month before death was detected in 64 (60%) of the 107 decedents with cancer (Group 1). 85% of these patients in Group 1 not receiving any treatment such as systemic chemotherapy, targeted molecular therapy, or endocrine therapy and they followed by best supportive care (BSC).

However, 43 (40%) decedents with cancer had not apply to the ED within one month before death (Group 2). Similarly, 92% of these patients not receiving any oncological treatments and they followed by BSC. The demographic and clinical characteristics of patients with Group 1 (n=64) is displayed in Table 1 and comparison of demographic, clinical, treatment and events characteristics of patients with Group 1 and Group 2 in this study are displayed in Table 2.

In Group 1, of those who applied the ED within one month before death, 28% made one visit, 42% made two, 14% made three, 10%made four, and 6% made five or more.

Table 1. Characteristics of Admission Emergency Service of Patients with Group 1 (n=64)

Features	n	%
Symptoms or signs of admission*		
Dyspnea/Shortness of breath	42	66
Pain	24	37
Detoriantation in general health status	14	22
Fever	4	6
Haemorrhage	2	3
Icterus	2	3
Abdominal distention/Ascites	3	5
Neurological symptoms	2	3
Causes of emergency admissions		
Cancer related symptoms and/or signs	56	25
Co-morbidities	6**	45
Oncological emergencies***	2	30
Arrival at the emergency service		
Ambulance	24	45
Other transportation or themselves	40	55
NO. of the visit to emergency service		
1	18	28
2	27	42
3	9	14
4	6	10
>5	4	6
Immediate outcome		
Dıscharge	24	38
Death in the emergency service	6	9
Hospitalization	34	53
Place of hospitalization		
Clinic of Medical Oncology	18	28
Clinic of Pulmonary Diseases	7	11
Clinic of General Medicine	3	4
Intensive Care/Coronary Care Unit	6	10
Endications of hospitalization (n=34)		
Pneumonia or COPD	4	12
Desorientetion of general status	7	21
Pain palliation	6	18
Social support	12	35
Haemoptysis	3	9
Bleeding from GIS or gynecological area	2	5
Duration of hospitalization (day) (n=34)		
<5	14	41
>5	20	59
Events Death in the emergency service	6	9
Death during hospitalization	11	17

*separately for each symptom; **4 patients acute coronary syndrome, 1 patient cardiac tamponade, 1 patient with chronic renal failure and acute cardiac failure; *** 2 patients with massive haemoptysis; GIS Gastrointestinal system; Abbreviations; COPD Chronic obstructive pulmonary disease

Cancer Patients Admitted to the Emergency Department within One Month before Death in Turkey

Table 2. Comparison of Demographic, Clinical, Treatment and Events Characteristics of Patients with Group 1 and Group 2 in this Study

Variables	Group 1*	Group 2**	P***
Patients (n, %)	64 (60)	43 (40)	-
Age (year)	51±11	52±13	0.244
Age stratification (n, %)			0.101
65 and less	22 (34)	24 (56)	
>65	42 (66)	19 (44)	
Sex			0.117
Male	41 (64)	21(49)	
Female	23(36)	22 (51)	
Tumour localization			0.046***
Lung	24 (38)	5 (12)	
Colon-rectum	11 (17)	11 (26)	
Breast	8 (12)	7 (17)	
Pancreaticobiliary	6 (9)	4 (9)	
Gynecological	5 (8)	9 (21)	
Stomach	4 (6)	2 (4)	
Bladder	0	2 (4)	
Prostate	4 (6)	3 (7)	
Brain	2 (4)	0	
Stage of Cancer			
Locoregional disease	31(48)	17 (40)	0.271
Metastatic disease	33 (52)	26 (60)	
Localization of metastatic lesions			0.098
Isolated liver or lung metastases	9 (27)	4 (15)	
Isolated bone metastases	3 (9)	3 (11)	
Isolated brain metastases	2 (6)	4 (15)	
Multipl metastases (bone and other)	13 (39)	8 (31)	
Multipl metastases (brain and other)	6 (19)	7 (28)	
ECOG Performance status			0.296
0 and 1	2 (3)	1 (2)	
2	12 (19)	8 (19)	
3	44 (69)	27 (63)	
4	6 (9)	7 (16)	
Treatment options			0.215
Best supportive care	51 (80)	35 (81)	
Endocrine treatment	7 (11)****	5 (12)****	
Orally or parenteral systemic chemoyherapy	2 (3)	1 (2)	
Targeted molecular treatment	4 (6)	2 (5)	
Living area			0.241
Urban	31 (48)	21(49)	
Rural	33 (52)	22 (51)	
Marital status			0.207
Maried	43 (67)	31 (72)	
Other	21 (33)	12 (28)	

(*A two tailed p value of <0.05 was considered statistically significant); Abbreviations: ECOG Eastern Collaborative Oncology Group; *Group 1,patients with at least once visit in final 4 months; **Group 2, patients with no visit to ED in final four months; ***P; A two tailed p value of <0.05 was considered statistically significant; **** Endocrine treatment with megestrol in patients with gynecological or breast cancer

In Group 1, among site of primary tumor the most common were the lung (n=24, 38%), colon-rectum (n=11, 17%), breast (n=8, 12%), pancreaticobiliary system (n=6, 9%), gynecological system (n=5, 8%), stomach (n=4, 6%), prostate (n=4, 6%), and primary tumor of brain (n=2, 4%). However, majority sites of primary tumor in Group 2 were colon-rectum (n=11, 26%), gynecological system (n=9, 21%), breast (n=7, 17%), lung (n=5, 12%), pancreaticobiliary system (n=4, 9%), prostate (n=3, 7%), stomach (n=2, 4%), and bladder (n=2, 4%). According to the analysis of the primary tumor localization in Group 1, lung cancer were significantly higher than other cancer sites (p=0.046).

The most common symptoms and signs for apply to the ED made within one month before death in Group 1 are listed in Table 1.

Table 3. Univariate Analyses of Visit to Emergency Service

Factors	Feature	p value*
Age (years)	≤65 years *vs* ≥65 years	0.046*
Gender	Male *vs* Female	0.211
Smoking Habit	Absence *vs* Presence	0.141
Weight loss	≤65 years *vs* ≥65 years	0.048*
Tumor location	Lung *vs* Colon-rectum *vs* other	0.031*
Stage of cancer	Metastatic *vs* Locoregional	0.036*
ECOG	≤65 years *vs* ≥65 years	0.046*
Co-morbidities	Absence *vs* Presence	0.064
Pain treatment	Fentanyl *vs* Tramadol *vs* Morphine etc	0.189
Chemotherapy or targeted treatment	Absence *vs* Presence	0.267
Localization of metastatic lesions	Lung *vs* other	0.041*
Oncological emergencies	Absence *vs* Presence	0.198
Cancer-related symptoms	Dyspnea *vs* Pleural effusion *vs* other	0.043*

*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)	1.34 (0.47-6.4)	0.165
Weight loss (≤10 kg or ≥ 10 kg at last 3 months)	1.25 (0.71-3.27)	0.232
Primary tumour localization (Lung *vs* other)	3.42 (1.09-6.65)	0.039*
Stage (Metastatic *vs* locoregional)	2.45 (1.24-5.18)	0.049*
ECOG (≤1 or ≥2)	1.89 (0.91-3.44)	0.274
Localization of metastatic lesions (Lung *vs* other)	1.49 (0.79-2.47)	0.153
Cancer-related symptom (Dyspnea *vs* other)	1.48 (0.89-3.15)	0.282

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

Of the 64 patients in Group 1, 38% (n=24) were discharged, 9% (n=6) died in the ED, 10% (n=6) hospitalization to ICU, 28% (n=18) were hospitalization to department of medical oncology, 11% (n=7) hospitalization to departments of pulmonary disease or infectious disease, and 4% (n=3)hospitalization to department of general medicine. Additionally, 14 of 24 patients who were discharged, died at home after being discharged from the hospital within one week. Similarly, 7 of 18 patients who were hospitalization to department of medical oncology, died at hospital within three days and 4 of 10 patients who were hospitalization to other departments died at hospital within four days.

Visits to ED within one month before death correlated significantly with tumour location (r=0.697; p= 0.029), good PS (r=0613; p=0.038), metastases to lung from solid tumors (r=0.625; p=0.034), presence of pleural effusion ((r=0643; p=0.031), and presence of pain (r=0513; p=0.044) in Group 1 patients. The most common location for tumor was the lung, in comparison to Group 2 patients (p=0.041).

Thus, we concluded that the relationship between visits to ED and advanced-stage lung cancer is independent from the other study variables (age, sex, smoking habits, weight loss, tumour location, stage of cancer, performance status by ECOG, co-morbidities, agents of pain palliation, chemotherapy, localization of metastatic lesions, oncologic emergencies, cancer-related symptoms; p=0.039; OR=3.42, 95%CI 1.09-6.65; Table 3 and Table 4).

Discussion

Our study showed that a significant proportion of cancer patients many times visits to ED and they die in

Birdal Yildirim and Ozgur Tanriverdi

ED or inpatient service such as department of medical oncology and pulmonary diseases. Additionally, lung cancer was most common primary tumor site and dyspnea, pleural effusion and pain were common symptoms for visits to ED within one months before death.

According to this results, our cancer patients prefer to be more likely to die in hospital (60%) and this result is quite high rates noted in previous studies. Although higher rates in comparison with prefer rates in some countries such as Canada (45%), Netherlands (31%) and United States (29%), the results of our patients with some other countries ratio such as Belgium (61%), Wales (60%), and United Kingdom (50%) are similar (Cohen et al., 2010; Lau et al., 2013; Wilson et al., 2013). However, this high rate can be explained by the low number of patients in our study.

The majority of patients admitted to the ED within one month before death was advanced-stage lung cancer (38%), especially non-small cell lung cancer (94%). This result was similar to previous studies (Barbera et al., 2010; Yucel et al., 2010; Kraft-Rovere et al., 2012; Gorham et al., 2013). In additionally, a few reviews involving patients with malignancy who applied the ED show that advanced-stage cancer and dyspnea are most common symptoms within last months of EOL and are associated with poor prognosis for life expectancy (Ho et al., 2011; Rosenwax et al., 2011; Wallace et al., 2012). In our study, the most common symptom was dyspnea (92%) in all cancer patients and pain in the second it was followed in frequency. Pleural effusion, the mass effect on lung parenchyma, bronchi, and vascular area of the primary or metastatic lesions, anxiety and chronic obstructive pulmonary disease was thought to be the major causes of shortness of breath. These findings were consistent with previous studies.

Although ED for cancer patients has a valuable role in caring patients with malignancies, it does not mean that the cancer patients related could be treated on in an acute care unit. Unless the symptoms of the patients the best possible treatment at home will always be the needs of ED admissions. For this reason, the home care option should be preferred for patients with cancer have reached the EOL than visits to ED. In addition, an effective palliation of end-stage cancer patients causes to improve their quality of life.

Our study outlook improves of why patients with cancer visit to ED within one month before death. However, this situation is not clear and cancer-related symptoms, treatment-related side-effects, lack of cancer caregiver training, lack of hospice or home care unit, relationship at home, increased anxiety and death affair of patients, and fatigue of caregivers along with a lot of factors may play a role in this situation.

How to reduce ED visits cancer patients and is this necessary? In addition, how the problems they encountered in the emergency department can be avoided? When we look at the issue with this point of view, a better quality of life for patients with cancer can be achieved at near EOL. Barbera et al in their study (2010), patients with cancer and made some suggestions to reduce visits to the emergency room. These recommendations are listed as follows:

"Exceptional symptom management standardization by clinical guidelines; fluid medical records to allow for improved continuity of care; caregiver education on anticipate and cope with crises for their patients; more robust and broad-reaching advance directives; increase palliative care workforce to improve access to experts in menagement management of complex symptoms, as well as technical/mechanical need for patients at home."

In conclusion, hospice system and home care unit are not sufficiently active in Turkey. Therefore, except for unexpected situations which seriously damages the lives of patients with end-stage cancer symptoms can be considered more treated in emergency departments. In addition, among the main causes of cancer patients at ED where their problems are: lack of sufficient trained caregivers, insufficient home care units and unknown themselves cancer diagnosis. In this study, we wanted to indicate that better management of cancer patients whose often visits to ED within last months of EOL. We conclude that hospice system is a very important in Turkey. Therefore, we believe that can be achieved this goal with the completion of the project, as PalyaTurk by the Ministry of Health.

References

Ahn S, Lee YS, Lim KS, Lee JL (2012). Emergency department cancer unit and management of oncologic emergencies: experience in Asan Medical Center. *Support Care Cancer*, **20**, 2205-10.

Angus DC, Barnato AE, Linde-Zwirble WT, et al (2004). Use of intensive care at the end of life in the United States. *Crit Care Med*, **32**, 638-43

Barbera L, Taylor C, Dudgeon D (2010). Why do patients with cancer visit the emergency department near the end of life. *CMAJ*, **182**, 563-8.

Bruera L, Russell N, Seweeney C, et al (2002). Place of death and its predictors for local patients registered at a comprehensive cancer center. *J Clin Oncol*, **20**, 2127-33

Cohen J, Houttekier D, Onwuteaka-Philipsen B, et al (2010). Which patients with cancer die at home? A study of six European countries using death certificate data. *J Clin Oncol*, **28**, 2267-73.

Earle CC, Park ER, Lai B, et al (2003). Identifying potential indicators of quality of end-of-life cancer care from administrative data. *J Clin Oncol*, **21**, 1133-8.

Gorham J, Ameve L, Berghmans T, Sculier JP, Meert AP (2013). The lung cancer patient at the emergency department: A three year retrospective study. *Lung Cancer*, **80**, 203-8.

Guddati AK, Kumar N, Segon A, et al (2013). Identifying oncological emergencies. *Med Oncol*, **30**, 669-75.

Ho T, Barbera L, Saskin R, et al (2011). Trends in the aggressiveness of end-of-life cancer care in the universal health care system of Ontario, Canada. *J Clin Oncol*, **29**, 1587-91.

Kraft-Rovere R, Dagnoni C, Gomes Correa CE, et al (2012). Profile of cancer patients treated at the emergency room of a tertiary cancer care centre in Southern Brazil. *Klin Onkol*, **25**, 452-6.

Lau F, Downing M, Tayler C, et al (2013). Toward a population-based approach to end-of-life care surveillance in Canada: Initial efforts and lessons. *J Pall Care*, **29**, 13-21.

Rosenwax LK, McNamara BA, Murray K, et al (2011). Hospital and emergency departments use in the last year of life: a baseline for future modifications to end-of-life care. *MJA*,

194, 570-3.

Wallace E, Walsh J, Conroy M, Cooney M, Twomey F (2012). Why do palliative care patients present to the emergency department? Avoidable or unavoidable? *Am J Hosp Palliat Care*, **23**, 1-4.

Wilson D, Cohen J, Deliens L, Houttekier D (2013). The preferred placeof last days: results of a representative population-based survey. *J Palliat Med*, 16, 502-8.

Wright AA, Zhang B, Ray A, et al (2008). Associations between end-of-life discussions, patients' mental health, medical care near death, and caregiver bereavement adjustment. *JAMA*, **300**, 1665-73.

Yates M, Barrett A (2009). Oncological emergency admissions to the norfolk and norwich university: an audit of current arrangements and patient satisfaction. *Clin Oncol*, **21**, 226-33.

Yucel N, Erkal HS, Akgun FS, et al (2012). Characteristics of the admissions of cancer patients to emergency department. *J BUON*, **17**, 174-9.