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Research Article

Evaluation of pain and associated clinical factors in cancer patients presenting to the emergency service of an oncology branch hospital

Onkoloji dal hastanesi acil servisine başvuran kanser hastalarında ağrı ve ilişkili klinik faktörlerin değerlendirilmesi

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Abstract

Aim: This study aimed to evaluate the relationship between the visual analog scale (VAS) score, pain localization, clinical outcome, and factors such as diagnosis, cancer type, stage, and metastasis in patients presenting to the emergency service (ES) with pain.

Materials and Methods: Age, gender, comorbid diseases, history of chemotherapy (CT), radiotherapy (RT), and surgery, primary organ, cancer type, duration, stage, metastasis, VAS score, diagnostic codes, and hospitalization/discharge status were recorded from the hospital database and patient files in cancer patients who presented to the ES with pain in 2023-2024 years. The relationship between VAS scores and clinical characteristics and outcomes was examined.

Results: The median age was 59.0 (16.0) years. The median cancer diagnosis was 5.0 (2.0) years. Nearly three-quarters of patients had received CT in the last month, and a quarter had received RT. 12.2% of patients had no other diagnosis and received analgesic therapy. 44.2% of patients had no diagnostic ICD code. The median VAS score was 7.0 (3.0). The VAS score of the patients admitted to ES with only pain was 8.0 (2.0). VAS scores were higher in patients with metastatic disease, who received RT in the last month, and those with bone metastasis. Correlation analysis in patients with only pain symptoms revealed a weak positive correlation between the risk of hospitalization and performance score (Rho = 0.232, p = 0.004).

Conclusion: VAS scores were higher in patients with metastatic disease who received RT in the last month and those with bone metastasis, and showed a weak positive correlation with the risk of hospitalization and performance scores in patients presenting to ES with only pain symptoms. The severity of cancer pain may result in an increased hospitalization ratio along with deterioration of the patient's general condition.

Keywords: neoplasm, emergency service, pain measurement

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Öz

Amaç: Acil servise (AS) ağrı şikayeti ile başvuran kanser hastalarında vizüel analog skala (VAS) skoru, ağrının lokalizasyonu, klinik son durum ve tanı, kanser tipi, evre ve metastaz gibi faktörler arasındaki ilişkiyi değerlendirmek amaçlandı.

Gereç ve Yöntemler: 2023-2024 yıllarında AS'ye ağrı şikayeti ile başvuran kanser hastalarının yaş, cinsiyet, komorbid hastalıklar, kemoterapi (KT), radyoterapi (RT) ve cerrahi öyküsü, primer organ, kanser tipi, süresi, evresi, metastaz, VAS skoru, tanı kodları ve yatış/taburculuk durumu hastane veritabanından ve hasta dosyalarından kaydedildi. VAS skorları ile klinik özellikler ve klinik son durum arasındaki ilişki incelendi.

Bulgular: Hastaların medyan yaşı 59.0 (16.0)'dı. Medyan kanser tanı süresi 5.0 (2.0) yıldı. Hastaların yaklaşık ¾'ü ve ¼'ü son bir ay içinde sırasıyla KT ve RT almıştı. Hastaların %12,2'sinde başka tanı yoktur ve analjezik tedavi almıştı. Hastaların %44,2'sinde tanısal ICD kodu yoktur. VAS skoru ortalaması 7.0 (3.0)'dı. Sadece ağrı ile AS'ye başvuran hastaların VAS skoru 8.0 (2.0) idi. VAS skorları metastatik hastalığı olan, son bir ay içinde RT alan ve kemik metastazı olan hastalarda daha yüksekti. Sadece ağrı olan hastalarda yapılan korelasyon analizi, hastaneye yatma riski ile performans skoru arasında zayıf bir pozitif korelasyon olduğunu göstermiştir (Rho = 0.232, p = 0.004).

Sonuçlar: VAS skorları, metastatik hastalığı olan, son bir ay içinde RT alan ve kemik metastazı olan hastalarda daha yüksekti ve sadece ağrı ile AS'ye başvuran hastalarda hastaneye yatma riski ve performans skoru ile zayıf pozitif korelasyon göstermiştir. Kanser ağrısının şiddeti, hastanın genel durumunun kötüleşmesiyle birlikte hastaneye yatış oranının artmasına neden olabilir.

Anahtar kelimeler: neoplazm, acil servis, ağrı ölçümü

Introduction

Over half of patients affected by cancer experience pain of moderate to severe intensity, often at multiple locations, with different etiologies and underlying mechanisms [1]. Studies have shown that cancer-related pain ranges from 14% to 100% [2]. 53% of patients experience pain at all stages of the disease, and 33% continue to experience pain after treatment [3]. Cancer pain is also a significant cause of emergency department visits and accounts for almost 1/3 of emergency department visits in cancer patients [4]. Cancer patients may present to the emergency service (ES) with an oncologic emergency diagnosis, with other emergency diagnoses, or with pain alone. In the emergency department, it should be kept in mind that cancer pain may be a solitary symptom or may accompany other cancer-related or unrelated emergency diagnoses that may cause significant mortality [5].

Effective pain management in the ES is essential for patient comfort, treatment adherence, and the maintenance or improvement of activities of daily living. There are many studies and publications on cancer pain. However, few studies have investigated the factors associated with pain in the emergency department and the relationship between pain and clinical outcomes [5-7]. A study found that patients with gastrointestinal and genitourinary system cancers were most frequently admitted to the emergency department, and patients receiving radiotherapy experienced less pain [4]. However, few studies have evaluated the relationship of pain with diagnostic groups, cancer type, stage, metastasis, age, and clinical outcome in a large number of patients.

In this study, we aimed to evaluate the relationship between pain intensity, localization, and clinical outcome, as well as factors such as emergency diagnosis, cancer type, stage, and presence of metastasis in cancer patients who presented to ES with pain or pain accompanied by other symptoms within two years, including 2023-2024.

Material and Methods

Cancer patients who presented to the ES with pain, with or without accompanying symptoms, between January 1, 2023, and December 31, 2024, were retrospectively included in the study. Age, gender, comorbid diseases, history of chemotherapy (CT) or radiotherapy (RT), and surgery, primary organ of neoplasm, type, duration, and stage of cancer, metastasis status, VAS (visual analog scale) score, diagnosis code in the emergency service (ES), hospitalization/discharge status, and biochemical parameters requested in that visit, such as ALT, AST, CRP, creatinine, glucose, sodium, potassium, calcium, phosphorus, creatinine, and complete blood count were recorded from the hospital information management database

and ES patient files. Patients with deficiencies in any of these variables, assessed over the 3 months preceding ES admission, were excluded from the study. According to diagnoses, patients with only pain symptoms were evaluated separately, and pain locations and associated variables with pain were examined. Ethics committee approval for the study was obtained from the Ethics Committee of Ankara Dr. Abdurrahman Yurtaslan Oncology Training and Research Hospital (Date: 26.06.2025, Number: 06/83). The study was conducted in accordance with the principles of the Declaration of Helsinki.

Statistical Analysis

Recorded data were analyzed using the Statistical Package for Social Sciences, version 27.0 (SPSS Inc., Armonk, NY). The normality of numerical data distribution was examined using Kolmogorov–Smirnov and Shapiro-Wilk normality tests. Normally distributed continuous variables were presented as mean and standard deviation, while non-normally distributed continuous variables were presented as median and interquartile range (IQR; 25th-75th percentiles), and qualitative data were expressed as frequencies and percentages. Spearman's rank correlation was used to assess the relationship among hospitalization variables. The confidence interval was set at 95%, and the accepted margin of error was 5%. Therefore, the p-value was considered significant when $p < 0.05$.

Results

The age, gender, type of admission, comorbidities, and some clinical features of the patients are presented in Table 1. The median age is 59.0 (16.0) years. 95% of the patients had solid malignancies. The median cancer diagnosis is 5.0 (2.0) years. Nearly three-quarters of patients had received CT and RT in the previous month.

The clinical features of patients and outcomes are documented in Table 2. Almost half of the patients were classified as oncologic emergencies, whereas the other half were classified as non-oncologic emergencies. A total of 151 (12.2%) patients had no other diagnosis and received analgesic therapy. Therefore, 44.7% (552/1236) of patients had no diagnostic ICD code or explanation of a specific diagnosis; thus, an important portion of this group might present only with pain symptoms. The median VAS score across all patients is 7.0. The types of pain according to predominant localization are illustrated in Figure 1. The types of analgesics and their dosages administered to the patients could not be evaluated due to missing documentation in the hospital database or patient files. The laboratory values of the patients are presented in Table 3.

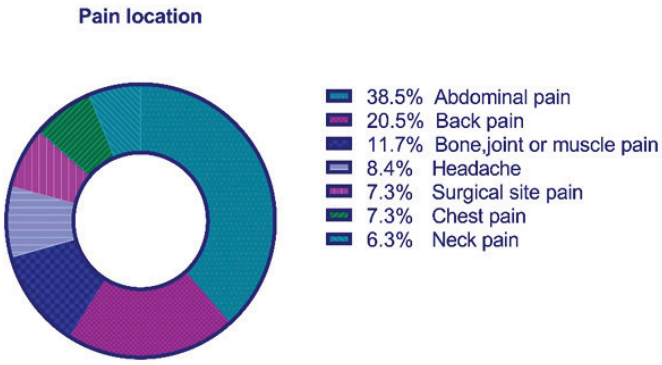

Figure 1. Distribution of pain locations among patients.

The VAS score for patients admitted to ES with only pain and no other diagnosis is 8.0 (2.0). The comparison of VAS scores across variables in this patient group is shown in Table 4. VAS scores are higher in patients with metastatic disease, RT in the last month, and bone metastasis than in patients without metastasis or RT history in the last month ($p<0.05$). The distribution of pain types in patients with only a pain symptom is illustrated in Figure 2.

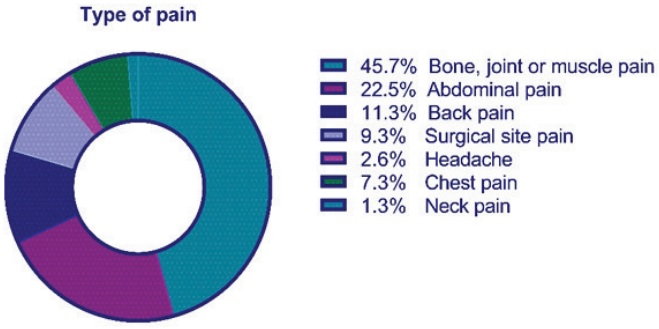

Figure 2. Distribution of pain types among patients.

Correlation analysis investigating variables associated with discharge from ES or hospitalization in patients with a diagnosis of only pain and no other diagnosis showed a weak positive correlation between risk of hospitalization and performance score (Rho = .232, p=0.004); however, no correlation was found between age, gender, comorbidity, history of RT or CT in the last month, VAS score, WBC, PLT, HgB, ALT, creatinine, CRP, Na, K, total protein, and albumin with risk of hospitalization.

Table 1. Demographic and clinical features of the patients (n=1236).

	N/% or median (IQR)
Age (median; IQR)	59.0 (16.0)
Gender (n/%)	
Female	650 (52.6)
Male	586 (47.4)
Type of admission (n/%)	
Outpatient	654 (52.9)
By ambulance	582 (47.1)
Comorbidities (n/%)	
HT	504 (40.8)
DM	239 (19.3)
CAD	156 (12.6)
COPD	108 (8.7)
CRD	30 (2.4)
Asthma	29 (2.3)
CVH	22 (1.8)
CHF	11 (0.9)
Others	56 (4.5)
Type of malignancy (n/%)	
Solid	1185 (95.9)
Hematologic	51 (4.1)
Solid malignancies	
GIS	409 (33.9)
Breast	296 (23.9)
Lung	192 (16.2)
Gynecological	98 (8.3)
Urological	91 (7.7)
Head and neck	25 (2.1)
Brain and spinal cord	20 (1.7)
Bone	19 (1.6)
Skin	16 (1.4)
Unknown origin	19 (1.6)
Hematologic malignancies	
Lymphoma	23 (45.1)
Leukemia	21 (41.2)
Other	7 (13.7)
Time after cancer diagnosis (years) (median; IQR)	5.0 (2.0)
Presence of metastasis (n/%)	1150 (93.0)
Specific organ/system metastasis (n/%)	
Lung	397 (32.1)
Bone	352 (28.5)
Liver	341 (27.6)
Brain	92 (7.4)
Cancer stage (n/%)	
New diagnosis	17 (1.4)
Locally advanced disease	396 (32.0)
Metastatic disease	729 (59.0)
Advanced-stage metastatic disease	94 (7.6)
Surgery history (n/%)	821 (66.4)
Chemotherapy within the last month (n/%)	897 (72.6)
Radiotherapy within the last month (n/%)	399 (32.3)

IQR: Interquartile range

Table 2. Clinical features of patients concerning pain, diagnosis, and clinical outcomes (n=1236).	
	N/% or median (IQR)
Localization/type of pain	
Abdominal pain	474 (38.3)
Bone-joint-muscle pain	253 (20.5)
Back pain	145 (11.7)
Headache	104 (8.4)
Surgical site pain	91 (7.4)
Chest pain	90 (7.3)
Neck pain	79 (6.4)
VAS score	7.0 (3.0)
Pain department consultation	76 (6.1)
Performance score	
0	236 (19.1)
1	485 (39.2)
2	277 (22.4)
3	198 (16.0)
4	40 (3.2)
Emergency diagnosis*	
Oncologic emergencies	623 (50.4)
Metabolic	65 (5.3)
Mechanic	309 (25.0)
Treatment-related	13 (1.0)
Blood-related	236 (19.1)
Non-oncologic emergencies	613 (49.6)
Pain	151 (12.2)
Non-classified/Other emergency codes	552 (44.7)
Outcomes in ES	
Discharge from ES	619 (50.1)
Hospitalization	591 (47.8)
Transfer to another hospital	21 (1.7)
Death	3 (0.2)
Refusal of treatment	2 (0.2)
Outcomes after hospitalization	
Discharged	454 (76.8)
Death	137 (23.2)

*Indicates the total number of diagnoses, so the number of diagnoses is higher than the total number of patients; IQR: Interquartile range, VAS: Visual analog scale, ES: Emergency service.

Table 3. Laboratory parameters of the patients (n=1236).	
	Median (Interquartile range)
White blood cell (x103/mm3)	7.30 (6.9)
Neutrophile count (x103/mm3)	5.1 (6.3)
Hemoglobin (mg/dL) (n=1236)	11.0 (2.8)
Platelet count (x103/mm3)	223.0 (177.5)
Glucose (mg/dL)	112.0 (44.0)
Blood urinary nitrogen (mg/dL)	16.0 (12.0)
Creatinine (mg/dL)	0.7 (0.5)
Uric acid (mg/dL)	5.1 (2.5)
Sodium (mg/dL)	136.0 (6.8)
Potassium (mg/dL)	4.1 (0.8)
Calcium (mg/dL)	8.5 (1.3)
Phosphorus (mg/dl)	3.5 (1.5)
Total protein (mg/dL)	5.8 (1.4)
Albumin (mg/dL)	3.2 (1.1)
Alanine aminotransferase (U/L)	19.0 (19.8)
Aspartate aminotransferase (U/L)	24.0 (24.0)
C-reactive protein (mg/dL)	12.0 (95.8)

Table 4. Comparison of visual analog scale scores in patients with only pain and no emergency diagnosis (n=151).		
Visual analog scale scores		**P**
Age<65 (n=104)	Age≥65 (n=47)	0.110
8.0 (2.0)	8.0 (2.0)	
Female (n=76)	Male (n=75)	0.077
8.0 (2.0)	8.0 (3.0)	
Local/local advanced (n=45)	Metastatic/Advanced metastatic (n=106)	0.033
7.0 (1.0)	8.0 (2.0)	
Chemotherapy within the last month (n=100)	No chemotherapy within the last month (n=51)	0.151
8.0 (2.0)	8.0 (3.0)	
Radiotherapy within the last month (n=40)	No radiotherapy within the last month(n=111)	0.013
9.0 (2.0)	8.0 (2.0)	
Lung metastasis (n=28)	No lung Metastasis (n=123)	0.898
8.0 (1.8)	8.0 (2.0)	
Bone metastasis	No bone metastasis	<0.001
9.0 (2.0)	8.0 (2.0)	
Liver metastasis (n=43)	No liver metastasis (n=108)	0.909
8.0 (2.0)	8.0 (2.0)	

Table 5. Correlation analysis for the risk of hospitalization in patients with only a pain symptom.		
Spearman correlation analysis		**Risk of hospitalization**
Performance score	Rho	.232
	P	.004
Age	Rho	.001
	P	.992
Gender	Rho	-.036
	P	.663
Chemotherapy in the last month	Rho	.054
	P	.511
Radiotherapy in the last month	Rho	-.027
	P	.740
WBC	Rho	.044
	P	.594
Hemoglobin	Rho	-.043
	P	.604
Platelet count	Rho	.064
	P	.437
ALT	Rho	-.034
	P	.678
Creatinin	Rho	.066
	P	.423
CRP	Rho	.176
	P	.031
Total protein	Rho	.011
	P	.893
Albumin	Rho	-.050
	P	.543

Discussion

Cancer is a global health problem with a gradually increasing incidence. Cancer patients may present to ES with oncological and non-oncological emergencies, pain secondary to cancer, or cancer treatment. Oncological emergencies are a significant cause of morbidity and mortality.[8]. In a study from our country, the OE frequency was 47.8%. [9] In this study, the percentage is % 50.4%. We did not find additional data on the frequency of oncologic emergencies in ES admissions. A review by Yılmaz et al. [10] of 49 articles on oncologic emergencies during emergency visits found that infection was the most common oncologic emergency documented, followed by pain, dyspnea, and gastrointestinal symptoms.

Pain associated with cancer itself or treatment-related factors such as surgery, RT, or KT could be the cause of ES visits[3]. Tsai et al.[4] found that cancer pain is the leading cause of ES visits, and % pain frequency was 28.7% in their study, including 1026 patients. In this study, we included patients with pain or pain with another symptom, so we could not give a frequency of pain in cancer patients admitted to ES. Therefore, we found that 12.2% of patients had isolated pain symptoms, while nearly 44.2% had no specific diagnostic code. Pain alone may have constituted a significant portion of this patient group. Abdominal, back, and bone, joint, or muscle pain are the most common causes of pain in patients with pain-alone symptoms. The high frequency of gastrointestinal tumors in the study might lead to this situation. The metastatic disease ratio is 93.0%. Back pain and bone-joint or muscle pain are the second and third-most common types of pain. Breast and lung cancers metastasizing to the bone are the second and third most common tumors, which may have led to the frequency of low back and bone and joint pain in this study. In a study, abdominal pain (35.6%), followed by generalized/nonspecific pain (19.7%) and musculoskeletal pain (17.2%), were found to be the most common types of pain in 483 patients who presented to the ES with pain complaints [11]. In this study, when combined with back pain, bone, joint, and muscle pain, the frequency is higher than in the study mentioned above. Therefore, we grouped patients according to the most painful location and excluded those with generalized or nonspecific pain. Differences in the ratios of different types of pain may have originated from classification. However, in patients with only pain, the frequency of bone, joint, and muscle pain together with back pain is 57%. These findings suggest that cancer-associated musculoskeletal pain is an important cause of admissions to ES.

When patients with only pain and no other diagnoses were evaluated, VAS scores were higher among patients with metastasis, bone metastasis, or a history of RT in the last month. Higher VAS scores in patients with metastasis, including bone metastasis, are expected findings. Tsai et al.[4] showed that patients who had received RT before had lower VAS scores. Patients under RT may present to ES because of pain secondary to plexopathies, peripheral nerve entrapment, myelopathy, osteonecrosis, and pelvic pain [12] . Therefore, these conditions are not sufficiently prevalent to account for the higher VAS scores in the RT group. However, the higher VAS scores in this study may result from pain-associated RT or from including patients who had been receiving RT for painful metastasis or the tumor itself, as we analyzed patients who had received RT within the last month.

Being a retrospective study, the lack of evaluation of the analgesics and dosages administered to patients, due to missing data on pain treatments and absence of specific diagnostic codes for some patients, are limitations of the study.

In conclusion, VAS scores were higher in patients with metastatic disease who received RT in the last month and those with bone metastasis, and showed a weak positive correlation with the risk of hospitalization and performance scores in patients presenting to ES with only pain symptoms. The severity of cancer pain may result in an increased hospitalization ratio along with deterioration of the patient's general condition. This situation shows the importance of pain management in the ES.

Declaration of conflicting interests

The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

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Ethics approval

This study was approved by the Ethics Committee of Ankara Dr. Abdurrahman Yurtaslan Oncology Training and Research Hospital (Date: 26.06.2025, Number: 06/83).

Authors' contribution

HG: Plan, design, or patern, Data collection or processing of collected data for analysis, Literature review, Writing and corrections, AB: Having an idea/opinion or contributing to the emergence and maintenance of the article/study, Revision, audit, review, Material Support, Checking and reviewing

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