Symptom assessment in cancer patients using the Memorial Symptom Assessment Scale

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ABSTRACT

Objective: Cancer is a chronic disease characterized by the unregulated proliferation and abnormal spread of cells. Symptoms that occur after chemotherapy treatment, which is the most commonly used treatment in cancer, negatively affect morbidity, effectiveness of treatment and quality of life. This study aimed to determine symptoms in cancer patients undergoing chemotherapy using the Memorial Symptom Assessment Scale (MSAS)

Material and Methods: A total of 273 cancer patients who applied to Ümraniye Training and Research Hospital emergency department as outpatients and were hospitalized in the internal medicine department were included in the study between 5/1/2014 and 6/4/2014. The study was conducted prospectively. Of the 273 participants, 41.3% were female (N = 112) and 58.7% were male (N = 159). The mean age of the participants was 62.46 ± 12.913 years (range, 32-92 years). Participants were divided into 6 groups based on diagnosis: Lung cancers, gastrointestinal cancers, cancers of the reproductive system, hematologic cancers, cancers of the urinary system and others. Each participant used the Memorial Symptom Assessment Scale (MSAS) containing 32 symptoms to rate whether they had experienced each symptom during the past week. Of these 32 items, 24 provide information on the intensity and frequency of symptoms, while 8 provide information on severity and distress.

Results: The most common types of symptoms based on the Memorial Symptom Rating Scale were lack of energy (72.9%), pain (71.1%) and difficulty concentrating (60.8%), while the least common symptoms were feeling “I don’t look like myself” (4.4%), swelling of arms and legs and changes in skin (7.3%) and constipation (8.4%).

Conclusion: Cancer patients have a lower quality of life due to the side effects of the treatments they receive or the impact of the cancer itself. The most common symptoms in the patients screened in this study were lack of energy and pain. In light of these data, determining the factors affecting the quality of life in cancer patients may be guiding in determining the symptomatic treatment for these patients and facilitating patient care.

Keywords: Cancer, symptom, Memorial Symptom Assessment Scale.

INTRODUCTION

Cancer refers to a group of chronic diseases caused by the unregulated proliferation and abnormal changes of cells in the body due to various factors, presenting with different clinical symptoms and requiring different treatment algorithms (1). According to the World Health Organization 2020 cancer statistics, it is reported that the number of patients diagnosed with cancer in 2020 reached an estimated 19.3 million worldwide and approximately 10.0 million people died of cancer. These data show that the global cancer burden has increased compared to 2018. (18.1 million cases and 9.6 million deaths in 2018)"
According to "The International Agency for Research on Cancer (IARC)", the number of people diagnosed with cancer is estimated to reach 27.5 million by 2040 (3).

According to the Cancer Statistics 2023 Report, the first three cancer types most frequently diagnosed in men in 2023 are expected to be prostate, lung, and colon cancer, and breast, lung, and colon cancer in women (4).

The increase in the incidence of cancer has prompted significant advances in cancer treatment. In addition to surgery, radiotherapy and chemotherapy, treatment modalities include hormonal therapy, stem cell therapy and biological methods. Treatment algorithms depend on the patient. One of the most commonly used treatment modalities is chemotherapy. Chemotherapy is the use of chemical, biological and synthetic agents to destroy cancer cells that proliferate uncontrollably or to slow their growth and prevent their spread (5-6). Chemotherapy can be used as curative or to prolong life or to control the symptoms of the disease. While the drugs used in cancer chemotherapy are highly effective on cancerous cells, they can also damage normal healthy cells and cause unwanted side effects. Chemotherapy-related side effects and the difficulty of the chemotherapy process cause serious labor and energy loss in patients. Patients also experience lack of appetite and severe nutritional disorders during this process. As a result, they are unable to meet their increased metabolic demand and suffer from severe lack of energy. This negatively affects the quality of life and causes patients to discontinue treatment. This study aimed to determine the most common symptoms and the most common reasons for hospital admission in patients undergoing chemotherapy.

MATERIAL and METHODS

In this study, 273 patients aged between 18 and 95 years with a known diagnosis of cancer who were hospitalized in the internal medicine service of Ümraniye Training and Research Hospital, admitted to the internal medicine outpatient clinic and emergency department, were included between 5/1/2014 and 6/4/2014 after written informed consent forms were obtained. Pregnant and lactating patients were excluded from the study. Participants were divided into six groups by diagnosis: lung cancers, gastrointestinal cancers, cancers of the reproductive system, hematologic cancers, cancers of the urinary system and others. Those who agreed to participate in the study were evaluated using the Memorial Symptom Assessment Scale (MSAS). (7,8,9) Each participant completed this scale composed of 32 symptoms and indicated whether they had experienced each symptom during the past week. They assessed the frequency, severity, and distress associated with each symptom by indicating the appropriate number on the questionnaire.

This study sought to find out which symptoms most frequently caused cancer patients to present to the hospital and to analyze the results in the light of previous studies, using the Memorial Symptom Assessment Scale (MSAS), which was developed by Portenoy et al. in 1994 (7) to assess severity, frequency and distress associated with symptoms experienced by cancer patients during the past week. The validity and reliability of the Turkish version of the scale were studied by Yıldırım et al. in 2011 (8).

This study found a statistically significant difference in symptoms by type of cancer (p < .05). A study conducted by Haryani et al. in 2018 using the Indonesian version of the Memorial Symptom Assessment Scale (MSAS-I) reported that the MSAS-I was a valid and reliable scale for measuring frequency, severity and distress associated with symptoms in cancer patients (9).

Before starting the study, Ethics Committee approval dated 14.11.2013 and numbered 15472 was obtained from Ümraniye Training and Research Hospital.

Statistical Analysis

The results of the study were statistically analyzed using IBM SPSS Statistics 21.0 software. Data were evaluated using descriptive statistical methods (mean, standard deviation, frequency), and quantitative data were compared using the Student's t test for comparisons between two groups of normally distributed parameters. Qualitative data, on the other hand, were compared using Chi-Square test and one-way variance test. Statistical significance was set at p < 0.05.

RESULTS

This study was conducted with 273 patient who were hospitalized in the internal medicine service of Ümraniye Training and Research Hospital, admitted to the internal medicine outpatient clinic and emergency department. Of the participants, 41.3% were female (N = 112) and 58.7% were male (N = 159). The mean age of the participants was 62.46 ± 12.913 years (range, 32-92 years). This study, conducted over a three months period, used the Memorial Symptom Assessment Scale (MSAS), and found a statistically significant difference in symptoms by type of cancer (p < 0.05). Feeling sad, difficulty concentrating and weight loss differed significantly in terms of frequency between male and female patients and were more common in males than females (p < 0.05). The most common symptoms were lack of energy (72.9%), pain (71.1%), and difficulty concentrating (60.8%); the least common symptoms were feeling “I don’t look like myself” (4.4%), swelling of arms and legs and changes in skin (7.3%) and constipation (8.4%) (p < 0.05). The distribution of all symptoms except difficult sleeping, constipation, feeling “I don’t look like myself” and skin changes was statistically significantly different among diagnostic categories (p < 0.05).

Participants were divided into six groups by diagnosis: lung cancers, gastrointestinal cancers, cancers of the reproductive system, hematologic cancers, cancers of the urinary system and others. Of the participants, 8.8% had lung cancers (N = 24), 31.1% had gastrointestinal cancers (N = 85), 9.2% had cancers of the reproductive system (N = 25), 31.5% had hematologic cancers (N = 86), 10.2% had cancers of the urinary system (N = 28) and 9.2% had other types of cancer (N = 25). Table 1 shows the sex distribution by diagnostic category.

The mean number of symptoms was, on average 8.68 ± 6.706 for women (N=112) and 10.00 ± 6.735 for men (N=159), with no statistically significant difference between women and men in terms of the mean number of symptoms.

Difficulty concentrating was reported by 52.7% of women versus 67.3% of men. Chi-Square significance analysis found...
a significant difference between men and women in terms of frequency distribution for the symptoms of difficulty concentrating (p < 0.05), feeling sad (p < 0.05), and weight loss (p < 0.05); frequency was higher in men.

The diagnostic category with the highest number of symptoms was lung cancers, while the diagnostic category with the lowest number of symptoms was hematologic cancers. The mean number of symptoms was 15.91 ± 6.758 in lung cancers, 11.80 ± 7.389 in gastrointestinal cancers, 8.50 ± 4.451 in cancers of the urinary system, 7.48 ± 6.758 in other types of cancer, 7.12 ± 7.119 in cancers of the reproductive system and 6.72 ± 5.795 in hematologic cancers. The total number of symptoms ranged from 5 to 28 in lung cancers, 1 to 32 in gastrointestinal cancers, 0 to 28 in cancers of the reproductive system, 0 to 25 in hematologic cancers, 1 to 17 in cancers of the urinary system and 0 to 23 in other types of cancer (Table 2).

The mean total number of symptoms was statistically significantly different by diagnostic category (p < 0.05). According to Scheffe’s post-hoc analysis, this difference stemmed from differences between lung cancers and other types of cancers (p < 0.05), lung cancers and cancers of the reproductive system (p < 0.05), lung cancers and hematologic cancers (p < 0.05), lung cancers and cancers of the urinary system (p < 0.05), gastrointestinal cancers and cancers of the reproductive system (p < 0.05), gastrointestinal cancers and hematologic cancers (p < 0.05). There was no significant difference between the other categories.

The study also analyzed the distribution of each of the 32 symptoms by diagnostic category. The most common symptoms were lack of energy (72.9%), pain (71.1%), and difficulty concentrating (60.8%), while the least common symptoms were feeling “I don’t look like myself” (4.4%), swelling of arms and legs and changes in skin (7.3%), and constipation (8.4%) (Table 3).

All symptoms, except difficulty sleeping, constipation, feeling “I don’t look like myself”, and changes in skin, showed a statistically significant difference by diagnostic category (p < .05).

Table 1. Cancer types and gender distribution of patients

<table>
<thead>
<tr>
<th>Type of cancer</th>
<th>Female n(%)</th>
<th>Male n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung</td>
<td>22(13.8)</td>
<td>22(13.8)</td>
</tr>
<tr>
<td>Gastrointestinal system</td>
<td>25(22.3)</td>
<td>6(37.3)</td>
</tr>
<tr>
<td>Reproductive system</td>
<td>23(20.5)</td>
<td>1(0.6)</td>
</tr>
<tr>
<td>Hematologic system</td>
<td>45(40.2)</td>
<td>40(25.2)</td>
</tr>
<tr>
<td>Urinary system</td>
<td>6(5.4)</td>
<td>2(13.8)</td>
</tr>
<tr>
<td>Others</td>
<td>11(9.8)</td>
<td>14(8.8)</td>
</tr>
</tbody>
</table>

Table 2. The Total Symptoms Values by Diagnostic Category

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Mean</th>
<th>Std Dev.</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Others</td>
<td>7,480</td>
<td>6,75845</td>
<td>.00</td>
<td>23,00</td>
</tr>
<tr>
<td>Lung</td>
<td>15,917</td>
<td>7,38928</td>
<td>5,00</td>
<td>28,00</td>
</tr>
<tr>
<td>Gastrointestinal system</td>
<td>11,800</td>
<td>6,04901</td>
<td>1,00</td>
<td>32,00</td>
</tr>
<tr>
<td>Reproductive system</td>
<td>7,1200</td>
<td>7,11993</td>
<td>.00</td>
<td>28,00</td>
</tr>
<tr>
<td>Hematologic system</td>
<td>6,7209</td>
<td>5,79584</td>
<td>.00</td>
<td>25,00</td>
</tr>
<tr>
<td>Urinary system</td>
<td>8,5000</td>
<td>4,45138</td>
<td>1,00</td>
<td>17,00</td>
</tr>
</tbody>
</table>

Difficulty concentrating was most common in lung cancers (79.2%), followed by gastrointestinal cancers (72.9%), cancers of the urinary system (71.4%), hematologic cancers (54.7%), cancers of the reproductive system (36.0%) and other types of cancers (36.0%). This shows a statistically significant difference between diagnostic categories (p < 0.05).

The prevalence of pain was 91.7% in lung cancers, 85.7% in cancers of the urinary system, 83.5% in gastrointestinal cancers, 64.0% in other types of cancers, 52.0% in cancers of the reproductive system and 55.8% in hematologic cancers. This shows a statistically significant difference between diagnostic categories (p < 0.05).

Distribution of lack of energy, cough, feeling nervous, dry mouth, nausea, difficulty sleeping, tingling and numbness in hands and feet, bloating, problems with urination, vomiting, shortness of breath, diarrhea, feeling sad, sweats, worrying, problems with sexual interest, itching, lack of appetite, dizziness, difficulty swallowing, feeling drowsy, mouth sores, change in the way food tastes, weight loss, hair loss, and swelling of arms and legs showed a statistically significant difference by diagnostic category (p < 0.05).

Participants rated how often they had experienced each of the symptoms during the past week using a Likert-type scale ranging from 1 (Rarely) to 4 (Constantly). Results showed that the mean frequency score for difficulty concentrating in patients who complained of it was 1.56 for other types of cancers; 1.95 for lung cancers; 1.95 for gastrointestinal cancers; 1.25 for cancers of the reproductive system; 1.28 for hematologic cancers and 1.50 for cancers of the urinary system. One-way analysis of variance found that the mean frequency scores for difficulty concentrating, pain, lack of energy, dry mouth and problems with sexual interest differed significantly by diagnostic category (p < 0.05).
The present study was conducted with patients with cancer and found that symptoms differed by type of cancer. The most frequently occurring symptom in the patients included in this study was low energy (72.9%). The analysis by type of cancer showed that low energy was the most common symptom and was seen in 62% of patients with hematologic cancers, 83% of patients with gastrointestinal cancers and 91.7% of patients with lung cancers. A study from Germany conducted by Oechsle et al. in 2014 with 61 end-stage cancer patients using the Memorial Symptom Assessment Scale found lack of energy to be the most common symptom (8). A study conducted by Seven et al. in 2010 with 142 cancer patients in an oncology unit found that the most common symptom was fatigue (87.3%) and pain (62%) (9). Lack of energy was also reported to be the most frequently occurring symptom in similar multicenter studies, and our results are consistent with these previous reports (10,11,12,13).

A study conducted by Englehart et al. in 2022 using the CMSAS scale found that the most common symptom was pain (14). A study conducted by Nazik et al. using the ESAS scale with 41 patients with gynecologic cancers undergoing chemotherapy at Adana Çukurova University reported that the most common symptoms in cancer patients were fatigue and pain (15). In this study, lack of energy, which was the most common symptom, was followed by pain (71.1%) (p<0.001). These results are in line with previous studies (14,15). Pain is a severe symptom for cancer patients.

This study investigated the association between sex and symptoms in cancer patients and found that male patients were more likely to experience feeling sad (35.8% of men), difficulty concentrating (67%) and weight loss (35.8%) compared to females. A study conducted by Popkin et al. that investigated symptoms in 121 cancer patients reported that certain symptoms were more common in male patients (16). This study found that, among cancer patients, males were more likely to feel sad than females.
The higher prevalence of sadness in men might be attributed to their sudden withdrawal from society, loss of productivity and need for care after diagnosis of cancer. In our study, there is no literature data showing that weight loss and difficulty in concentration complaints are more common in the male gender and these are the first results in the literature.

Problems with sexual interest or activity were seen in 57% of the patients included in this study. In a study conducted by Yıldırım et al. in 2011 using the Memorial Symptom Assessment Scale in 120 cancer patients, of whom 52% had breast cancer, 21% had gastrointestinal cancers, 6% had genitourinary cancers and 4% had lung cancer, the most common symptoms were reported to be problems with sexual interest (90%) and loss of energy (85.8%) (8). Given that problems with sexual interest are a common symptom, the lower frequency found for this symptom in our study compared to previous studies may be due to the timidity and discomfort of the patients in reporting this symptom.

In our study, the most common symptoms after pain and lack of energy in patients with lung cancers were shortness of breath (83.3%) and cough (79.2%). In a study conducted by Yıldız et al. in 2019 with patients with lung cancers, the most common symptom was reported to be dyspnea and the most common reason for hospital admission was pneumonia (17). The results of this study are in line with our study. In patients with lung cancer, shortness of breath is a common symptom, depending on tumor location. We think that respiratory distress, like pain, causes cancer patients to feel sad and negatively affects adherence to treatment.

The major limitation of this study is the small sample size. Different symptoms occur at different stages of each cancer. Although patients in this study were evaluated using the MSAS scale, an objective method, the most common symptoms may differ due to the random selection of cancer patients at different stages. This is another major limitation of our study.

**CONCLUSION**

In conclusion, cancer patients have a significant symptom burden due to the challenging treatment process and long-term side effects of both the disease and the treatment, and it is not clearly known which symptoms are more common in patients with cancer. These symptoms need to be identified to help patients cope with their challenges, maintain their psychological and physiological well-being, enhance their self-care abilities, and deliver quality services aimed at improving their quality of life. Healthcare professionals play a crucial role in detecting, managing, and preventing symptoms.

The population in this study was composed of a limited number of patients admitted to our hospital. The frequency of specific symptoms should be investigated more objectively by using a larger sample derived from different communities and regions of Türkiye.

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**Author Contributions**: SK, SB: Designed and directed the study, Literature search, Data collection, Statistics SK: Article writing, Final revisions. All authors reviewed the results and approved the final version of the manuscript.

**Ethical approval**: The present study was conducted in strict accordance with the principles outlined in the Declaration of Helsinki. Ethical approval for the study was obtained from the appropriate ethics committee. Ethics Committee approval: This study received approval from Ümraniye Training and Research Hospital Medical Ethics Committee (approval date: 14/11/2013, no: 15472)

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