

Pain beliefs and affecting factors of the hematopoietic stem cell transplant patients with hematological cancer

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ABSTRACT

Aim: This descriptive study was conducted to determine the pain beliefs and affecting factors of the cancer patients subjected to hematopoietic stem cell transplantation.

Methods: The sample of the study was 94 hematologic cancer patients monitored and treated at the Gazi University Research and Application Hospital Stem Cell Transportation Unit. "Pain Beliefs Scale" and 33 questions prepared by the researcher by examining the literature were used as the data collection means. For the analysis of the data, descriptive statistics, Kruskal-Wallis test, single-way variance analysis, and *t*-test in independent groups were used.

Results: Organic belief score average of the patients under the study was found to be 3.8 ± 0.9 and psychological belief score average was found to be 4.7 ± 1.0 . The organic belief scores of patients were high in married patients, while psychological beliefs were high in single patients. The pain beliefs were not affected by the age, education level, gender, working status, and pain severity ($P > 0.05$). However, the organic belief score average of the patients who agreed that cancer could cause pain was significantly high from the statistical point of view ($P < 0.05$).

Conclusion: According to the results obtained from the study, nurses were recommended to assess the organic and psychological beliefs with respect to the cause of the pain of the patients suffering pain.

Key words: Hematological cancer, hematopoietic stem cell transplantation, nurse, pain beliefs

INTRODUCTION

Pain is seen in 30–40% of all cancer patients and in 70–90% of patients with progressed cancer.^[1,2] In hematologic cancer, pain is seen in 37–90% of patients.^[3] Pain in hematologic cancer is associated with cancer-related factors (mass formation in body cavities, enlargement of organs, injuries of peripheral nerve endings, involvement of visceral, cutaneous and mucous membranes, osteolytic lesions, and bone marrow infiltration of malignant cells), complications associated with cancer therapy (neuropathic pain due to chemotherapy and radiotherapy and predisposition to painful infections due to immunosuppression), diagnosis and treatment-related procedures (invasive diagnostic procedures, bone marrow aspiration, biopsy, and catheter insertion), and non-clinical factors.^[4,5] Pain is seen in 27% of patients who undergo hematopoietic stem cell transplantation (HSCT).^[6] Factors causing pain in HSCT-treated individuals include primary diseases, stem cell mobilization, mucositis, skin lesions, peripheral neuropathy, graft versus host disease (GVHD), immunosuppressive drugs, and diagnostic and therapeutic interventions.^[7–9] In HSCT, pain can be seen before transplantation, during transplantation, during the process of engraftment, and after discharge.^[5] Before HSCT, the patient may experience pain due to damage to the mucosal tissues caused by the high dose of radiotherapy and chemotherapy used in the preparation regimen.

Pain during HSCT can be seen as headache and abdominal pain due to stem cell infusion.^[7] Post-HSCT pain may be due to different causes before and after the engraftment (bone marrow reconstruction). One of these causes is veno-occlusive disease (VOD), which is the result of high-dose chemotherapy and radiotherapy used in the preparation regimen and causes liver damage, and severe pain is seen in VOD. VOD occurs on average 30 days after HSCT and occurs in 10–60% of stem cell recipients.^[10,11] One of the complications that can develop after stem cell transplantation is GVHD. In patients treated with allogeneic stem cell transplantation, immunological reaction-induced GVHD from donor T-lymphocytes is seen in 40–70% of patients.^[12] GVHD can involve the skin, gastrointestinal tract, eye, oral cavity, and musculoskeletal system. Pain may be due to ulcerations originating from GVHD, as well as 80–100% of pain, depending on the drugs used in the prophylaxis and treatment of the disease.^[5] One of the causes of pain in stem cell transplantation is infections. Especially, postherpetic neuralgia is seen due to herpes zoster virus infection. Postherpetic neuralgia causes chronic pain. Herpes zoster infection is seen in 15–45% of autologous stem cell transplantation and 41–59% of allogeneic stem cell transplantation.^[13]

Cancer pain reduces the quality of life by affecting every aspect of life, including the patient's major sleep, working status, leisure

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activities, and social interaction.^[14] For this reason, the presence of pain relief initiatives has a vital importance in oncologic patients.^[15] While cancer pain can be effectively treated with 80–90% pharmacological methods, many cancer patients experience severe pain at different times after being diagnosed.^[16] There are many factors that prevent effective treatment of cancer pain. Patients' negative beliefs about pain and treatment are patient-induced obstacles in the treatment of pain.^[17-20] Pain beliefs are cognitive considerations related to the pain of the patient. Basically, pain beliefs focus on two concepts, organic and psychological beliefs. Organic beliefs are based on the perception that the cause of pain is "injury to the body, damage." Psychological beliefs are the result of psychological factors such as anxiety and depression at the origin of the pain.^[21,22]

Assessment and treatment of pain are the main tasks of health personnel.^[23] Pain is as important as blood pressure, respiration, pulse, and fever, and it is suggested by the American Pain Society as a fifth vital finding since the year 1990.^[24] In addition, acute and chronic pain is included in the existing nursing diagnoses established by the North American Nursing Diagnosis Association.^[25] For this reason, the nurse has an indispensable role in the evaluation and management of pain. Nurses have a special place in pain management between the other members of the health team. Because they have been for a long time with patients and they can explore and know the patient's pain experiences and pain behaviors.^[24] There is no study to determine the beliefs of pain and the factors affecting cancer patients in our country. The purpose of this study is to determine the beliefs and affecting factors of patients with hematological cancer who undergo HSCT.

METHODS

The descriptive and cross-sectional type of this study consisted of 120 hematologic cancer patients who underwent HCST in the stem cell transplantation unit of a university hospital and whose follow-up and treatment in the outpatient clinic continued. There were 94 patients who agreed to participate in the study's sample.

Data Collection

The data were collected using the patient identification form and pain beliefs questionnaire (PBQ).

Patient Identification Form

The form consisted 33 questions that 7 of them about patients' sociodemographics; 14 questions about patients' diseases, treatment, and stem cell transplantation; 3 questions about patients' pain; and 9 questions about patients' expressions of pain. In this study, patients' pain evaluated by visual pain scale (VAS). VAS is a 10-cm ruler that is painless at one end and the most severe pain at the other end.^[23]

The PBQ

The scale developed by Edwards *et al.* in 1992 was adapted to Turkish in 2006 by Sertel Berk. Likert type scale consists of 12 items. There are two subdimensions of the scale: Organic pain beliefs and psychological pain beliefs. The scale rating varies from 1 to 6 for each item. In the reliability study of the scale, the internal consistency scores were measured with the Cronbach's alpha coefficient, which was reported as 0.71 for the organic belief subtest and 0.73 for the psychological belief subtest. There are no

cut points for your scale. Scores that can be taken from the organic belief subscale of the scale vary between 6 and 1. The increase in points taken from the subdimension of organic beliefs suggests that organic references to the source of pain increase. The scores that can be taken from the subdimension of psychological beliefs vary between 6 and 1. The increase in scores from the subscale of psychological beliefs suggests that psychological referrals related to the source of pain increase.^[26]

Statistical Analysis

Statistical package software (SPSS 17) was used for statistical analysis while the data obtained in the study were evaluated. Pearson's Chi-square test was used to compare qualitative data as well as descriptive statistical methods (frequency, percentage, mean, and standard deviation). In the comparison of the quantitative data, the independent samples t-test was used in the case of two groups. In the case of more than one group, one-way ANOVA and Kruskal-Wallis tests were used. The results were evaluated as 95% confidence interval, $P < 0.05$ significance and bidirectional.

The Ethical Aspects of the Study

The Ethics Committee approval was received from Hacettepe University Ethics Board. Both oral and written consents of participants were obtained. Furthermore, the permissions were also obtained from the institution where the study was performed.

RESULTS

36.2% of the patients were 29 years and under, 63.8% were male, 66.0% were married, 37.8% were primary school graduates, and 35.1% were not working. 35.1% of the patients were diagnosed as multiple myeloma [Table 1]. It was determined that 85.1% of patients before HSCT had received chemotherapy and 43.6% received radiotherapy. 81.9% of patients were given chemotherapy as HSCT preparation regimen and 18.1% were given chemotherapy and radiotherapy. Autologous HSCT was applied to 41.5% of patients, and allogeneic HSCT was applied to 58.5% of patients. 27.7% of the patients had relapse stories after HSCT. 47.9% of patients after HSCT were found to have growth factor, 25.5% to steroid therapy, and 29.8% to receive immunosuppressive therapy. 23.4% of HSCT patients developed GVHD and 21.7% of them developed infection [Table 2]. The average score of organic beliefs of the patients was 3.8 ± 0.9 , and the mean score of psychological beliefs was 4.7 ± 1.0 [Table 3].

Age, gender, educational level, and severity of pain did not affect the beliefs of the patients on organic and psychological pain ($P < 0.05$). The mean score of organic beliefs of married patients was found to be statistically significantly higher than that of single patients ($P = 0.022$). The mean score of psychological beliefs of single patients was statistically higher than the married ones ($P = 0.046$). The mean scores of organic beliefs of patients with a chronic disease other than cancer were higher than those without chronic disease, and a statistically significant difference was found between the two means ($P = 0.037$). The average score of organic beliefs of patients who approved the phrase "Do cancer lead to pain?" was higher than those who did not, with a statistically significant difference between the two means ($P = 0.008$). The mean score of organic beliefs of patients who approved the expression "Does the increase of pain indicate that the disease is

Table 1: Some characteristics of HSCT patients

Characteristics	N (%)
Ages	
29 age and below	34 (36.2)
30–39 age	12 (12.8)
40–49 age	19 (20.2)
50 and upper age	29 (30.8)
Gender	
Female	34 (36.2)
Male	60 (63.8)
Marital status	
Married	62 (66.0)
Single	27 (34.0)
Education level	
Primary education	35 (37.8)
Secondary school	19 (20.2)
High school	19 (20.2)
University	21 (22.3)
Working status	
Unemployed	33 (35.1)
Retired	24 (25.5)
Housewife	15 (16.0)
Working	11 (11.7)
Away/reporting of	
Student	2 (2.1)
Patient diagnosis	
Multiple myeloma	33 (35.1)
Acute myeloid leukemia	24 (25.5)
Acute lymphoblastic leukemia	16 (17.0)
Hodgkin's lymphoma	10 (10.6)
Myelodysplastic syndrome	4 (4.3)
Non-Hodgkin's lymphoma	4 (4.3)
Chronic myeloid leukemia	3 (3.2)

HSCT: Hematopoietic stem cell transplantation

progressing?" was statistically significantly higher than those who did not ($P = 0.015$). The mean score of organic beliefs of patients reporting pain was 3.5 ± 0.8 , which was statistically significantly lower than the mean (4.0 ± 0.9) of patients reporting no pain ($P = 0.011$) [Table 4].

DISCUSSION

The mean score of organic beliefs of cancer patients who received HSCT in this study was 3.8 ± 0.9 ; the mean score of psychological beliefs was 4.7 ± 1.0 and the mean of psychological beliefs was higher than the average of organic beliefs. Similarly, in the study conducted by Babadağ *et al.* (2015) with algology patients, the average of organic beliefs was 3.9 ± 0.7 , and the mean of psychological beliefs was 5.0 ± 1.0 .^[27] Melzack and Gagliese (1997) reported that the mean scores of psychological beliefs of patients with chronic pain were higher than the average scores of organic beliefs.^[28] There was no statistically significant difference between age, organic beliefs, and psychological beliefs in our study. According to a study conducted with algologic patients, it is reported that there is no relation between age and organic beliefs and psychological beliefs.^[27] It was also stated that organic and psychological beliefs did not change with age ($P > 0.05$).^[26,28-30] Our study is similar in this respect to the literature and it is thought that psychological factors affect the pain of our patients more.

Table 2: Some characteristics of patients about HSCT

Characteristics	N (%)
Type of HSCT	
Autologous	39 (41.5)
Allogeneic	55 (58.5)
Chemotherapy receiving status before HSCT	
Yes	80 (85.1)
No	14 (14.9)
Receiving radiotherapy before HSCT	
Yes	41 (43.6)
No	53 (56.4)
Preparation regimen for HSCT	
Chemotherapy	77 (81.9)
Chemotherapy plus radiotherapy	17 (18.1)
Relapse after HSCT	
Yes	26 (27.7)
No	68 (72.3)
Using growth factor	
Yes	45 (47.9)
No	49 (52.1)
Using steroidal drug	
Yes	24 (25.5)
No	70 (74.5)
Immunosuppressive therapy	
Yes	28 (29.8)
No	66 (70.2)
Complication - Graft versus host disease	
Yes	22 (23.4)
No	72 (76.6)
Complication-infection	
Yes	20 (21.7)
No	74 (78.3)

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Table 3: The mean (\bar{X}) and standard deviation (SD) of pain beliefs in HSCT patients

Pain beliefs	$\bar{X} \pm SD$
Organic pain beliefs	3.8 ± 0.9
Psychological pain beliefs	4.7 ± 1.0

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There was no statistically significant difference between the mean scores of organic and psychological beliefs according to sex in our study. In the study conducted by Sertel Berk (2006) with patients with chronic pain, it was stated that the average score of organic beliefs of women (4.6 ± 0.65) was significantly higher than the average score of men (4.27 ± 0.97) ($P < 0.05$). In the same study, it was reported that psychological beliefs did not change according to sex.^[26] Edward *et al.* (1992) found no association between organic and psychological beliefs and sex.^[30] Koçoğlu and Özdemir (2011) stated that organic and psychological beliefs did not change according to sex.^[29] Similarly, Babadağ *et al.* reported that the beliefs of pain did not change according to sex.^[27] In this context, it can be said that sex does not affect organic and psychological beliefs.

The change of organic and psychological beliefs according to the married or single status of the patients was statistically

Table 4: The mean (\bar{X}) and standard deviation of pain beliefs according to characteristics of HSCT patients

Characteristics	Organic pain beliefs	Psychological pain beliefs
Ages		
29 age and below	3.6±0.9	4.8±0.9
30-39 age	3.8±0.7	4.4±0.8
40-49 age	4.0±0.8	4.1±1.3
50 and upper ages	4.1±1.1	4.8±1.0
<i>P</i> value	<i>P</i> =0.140	<i>P</i> =0.173
Gender		
Female	3.7±0.9	4.5±1.0
Male	3.8±0.9	4.7±1.0
<i>P</i> value	<i>P</i> =0.809	<i>P</i> =0.466
Education level		
Primary education	3.9±0.9	4.8±1.1
Secondary school	3.8±0.9	4.3±1.1
High school	4.0±0.7	4.5±0.9
University	3.7±1.1	4.8±0.9
<i>P</i> value	<i>P</i> =0.782	<i>P</i> =0.477
Marital status		
Married	3.9±0.9	4.4±1.1
Single	3.5±0.7	4.8±0.9
<i>P</i> value	<i>P</i> =0.022	<i>P</i> =0.046
Chronic disease		
Yes	4.3±1.1	4.7±1.0
No	3.8±0.9	4.7±1.0
<i>P</i> value	<i>P</i> =0.037	<i>P</i> =0.932
Does cancer cause pain?		
Yes	4.0±1.0	4.7±1.0
No	3.4±0.9	4.4±1.1
<i>P</i> value	<i>P</i> =0.008	<i>P</i> =0.28
Does the increase in pain indicate that the disease is progressing?		
Yes	4.0±1.0	4.4±1.1
No	3.6±0.9	4.8±1.0
<i>P</i> value	<i>P</i> =0.015	<i>P</i> =0.152
Pain		
Yes	3.5±0.8	4.6±1.1
No	4.0±0.9	4.5±0.9
<i>P</i> value	<i>P</i> =0.011	<i>P</i> =0.644
Pain level according to VAS		
1-3	4.0±0.9	4.5±0.9
4-6	4.0±0.9	4.5±1.0
7-10	4.1±0.8	4.4±0.8
<i>P</i> value	<i>P</i> =0.957	<i>P</i> =0.948

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significant ($P < 0.05$). According to this, the average score of organic beliefs of married patients is higher than that of single patients; the average score of psychological beliefs of single patients is higher than that of married patients. Sertel Berk reported that organic beliefs did not change statistically according to the status of being married or single, but the psychological beliefs were statistically significant in single patients ($P < 0.05$).^[26] Koçoğlu and Özdemir (2011) reported that organic and psychological beliefs did not change according to marital status.^[29] Psychological beliefs in our study were found to be similar in the literature to the single patients. In our study, it is considered that the psychological beliefs of married patients are less due to the effects of family support systems such as spouses and children. This suggests that cancer patients,

supported by spouses and families, are more likely to associate with organic factors.

There was no statistically significant difference between pain severity and organic and psychological beliefs in our study. Algology patients are reported to have no difference between pain severity and organic and psychological beliefs.^[27] Similarly, Edward *et al.* (1992) reported no association between pain severity and organic and psychological beliefs.^[30] It can be said that the severity of pain of the patients does not affect the organic and psychological references related to the origin of the pain.

In our study, it was found that the average level of organic beliefs of those with at least one chronic illness other than cancer was

statistically significantly higher than those without chronic disease ($P < 0.05$). In addition, the organic and psychological beliefs of patients did not change according to the type of hematological cancer. The fact that the organic and psychological beliefs of the patients did not change according to the diagnosis in this study was attributed to the frequent occurrence of chronic pain in hematologic cancers.^[31]

CONCLUSION

In this study, it was concluded hematological cancer patients that receiving HSCT had more psychological references to the origin of the pain than the organic references. The age, sex, education level, and pain intensity of HSCT-treated hematological cancer patients did not affect the organic beliefs about the origin of the pain; the marital status, the chronic illness story, the thinking that cancer will cause pain, and the expression of pain as a progression of the disease affect their organic beliefs. It was determined that the psychological beliefs about the origin of the pain were related with patient's marital status. But patient's age, gender, education level, chronic disease story, thought that cancer would cause pain, increase of pain as a progression of disease, pain state and pain severity weren't related with psychological beliefs.

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