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Araştırma Makalesi/ Research Article

Hipertermik İntraperitoneal Kemoterapi Uygulanan Hastalarda Ameliyat Sonrası Öz Bakım Gücünün Değerlendirilmesi*

*Evaluation of Post-Operative Self-Care in Patients Used with Hyperthermic Intraperitoneal Chemotherapy**

Sümeyra AKARSU[1], Evin KORKMAZ[1]

Özet: Bu tanımlayıcı-kesitsel çalışma, sitoredüktif cerrahi (SRC) ile kombine hipertermik intraperitoneal kemoterapi (HİPEK) uygulanan, 18 yaş ve üzeri, Türkçe iletişim kurabilen ve çalışmaya katılmaya gönüllü 66 hastanın ameliyat sonrası öz bakım gücünü değerlendirmek amacıyla yürütüldü. Çalışma, Ocak 2024–Temmuz 2024 tarihleri arasında bir eğitim ve araştırma hastanesinin gastroenteroloji servisinde gerçekleştirildi. Veriler Demografik Bilgi Formu ve Öz Bakım Gücü Ölçeği ile toplandı. Demografik Bilgi Formu ve Öz Bakım Gücü Ölçeği kullanılarak veriler toplandı. Elde edilen bu veriler free trial version of SPSS Statistics for Windows 25.0 programı kullanılarak analiz edildi. Verilerin normalliği Kolmogrov-Simirnov testi ile uygulandı. Bu doğrultuda Öz Bakım Gücü Ölçeği toplam puanı ile kategorik değişkenleri arasında, kronik hastalık varlığında "Evet" ve "Hayır" gruplarının toplam puan ortalamaları arasında anlamlı bir fark bulundu (p= .001). Sürekli ilaç kullanım durumu sonuçlarına göre, "Evet" ve "Hayır" gruplarının toplam puan ortalamaları arasında anlamlı bir ilişki bulundu (p= .006). Çalışmaya katılan hastaların Hipek uygulaması hakkında bilgi sahibi olup olmadığı ile ölçek toplam puanı arasında istatistiksel olarak anlamlı bir ilişki saptandı (p= .001). Sonuç olarak bu çalışma, SRC ve HİPEK uygulanan hastalarının ameliyat sonrası öz bakım gücünü değerlendirmekte ve bu kombine tedavinin olumlu/olumsuz sonuçlarının öz bakım gücü açısından hasta üzerinde nasıl etkileri olduğunu göstermektedir.

Anahtar Kelimeler: Hemşirelik Bakımı, Hipertermik İntraperitoneal Kemoterapi, Öz Bakım Gücü, Sitoredüktif Cerrahi.

Abstract: This descriptive cross-sectional study was conducted to evaluate postoperative self-care agency in 66 adult patients who underwent cytoreductive surgery (CRS) combined with hyperthermic intraperitoneal chemotherapy (HIPEC), were able to communicate in Turkish, and volunteered to participate. The study was carried out in the gastroenterology ward of a training and research hospital between January 2024 and July 2024. Data were collected using the Demographic Information Form and the Self-Care Agency Scale. These data were analyzed using the free trial version of SPSS Statistics for Windows 25.0. The normality of the data was examined using the Kolmogorov-Smirnov test. In this regard, a significant difference was found between the total scores of the Self-Care Capacity Scale and the categorical variables, and between the total score averages of the “Yes” and “No” groups in the presence of chronic disease (p= .001). According to the results of continuous medication use, a significant relationship was found between the total mean scores of the “Yes” and “No” groups (p= .006). A statistically significant relationship was found between whether patients participating in the study were aware of the Hipek application and their total scale score (p= .001). In conclusion, this study evaluates the postoperative self-care ability of patients who underwent CRS and HIPEC and demonstrates the effects of this combined treatment on patients in terms of self-care ability, both positive and negative.

Keywords: Nursing Care, Hyperthermic Intraperitoneal Chemotherapy, Self-Care Capacity, Cytoreductive Surgery.

[1] Bahçeşehir Üniversitesi, Lisansüstü Eğitim Enstitüsü, İstanbul /Türkiye

* Çalışma 928085 numaralı Yüksek Lisans tezinden üretilmiştir.

Sorumlu yazar/ Corresponding Author: Evin KORKMAZ
Orcid ID: https://orcid.org/ 0000-0002-3514-5627
Adres/Address: Bahçeşehir Üniversitesi, Lisansüstü Eğitim Enstitüsü
E-posta/e-mail: dr.evinkorkmaz@gmail.com

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INTRODUCTION

Cytoreductive surgery (CRS) and Hyperthermic Intraperitoneal Chemotherapy (HIPEC) were described by Sugarbaker in 1995 (Kalaycı et al., 2017). HIPEC has been used to treat peritoneal cancer since 1990 (Genç, 2021). CRS is a lengthy procedure performed prior to HIPEC, during which macroscopic tumors are removed (Kalaycı et al., 2017). Significant changes occur during the HIPEC phase, and it is an effective treatment option for cases with peritoneal carcinomatosis. After tumor removal in CRS, a heated chemotherapy solution is administered into the peritoneal cavity. In patients undergoing CRS+HIPEC, morbidity and mortality rates of 65% and 12%, respectively, have been reported (Özay et al., 2021). Body fluids of patients receiving HIPEC are considered contaminated for 48 h, and safety precautions should be taken during this period. Monitoring vital signs and complications is important in the care of complicated cases. In nursing interventions, attention should be paid to the incision site, drain, central venous pressure, and respiratory and renal functions (González-Moreno et al., 2010; Wooten 2009). HIPEC can be performed using open, semi-open, and closed techniques. In the open technique, four vacuum drains are placed in the abdominal wall, and the wound is covered with a plastic drape. In this method, the risk of environmental contamination and exposure of the surgeon to chemotherapeutic agents is high (Kyriazanos et al., 2016). In the semi-open technique, the skin is closed before HIPEC is performed and reopened and reclosed after the procedure (Kyriazanos et al., 2016; González-Moreno et al., 2010). In the closed technique, drains and heat probes are placed, the perfusate is drained, and the abdomen is cleaned with a saline solution (Kyriazanos et al., 2016).

Temperature control strategies differ between the cytoreductive surgery and HIPEC phases. During cytoreductive surgery, significant heat loss occurs, and hypothermia should be prevented with forced air warming, heated infusions, and arm covers. During the HIPEC phase, patients should be cooled; cold fluids, ice packs, and cooling beds are used (Arakelian et al., 2011; Coccolini et al., 2014). Mechanical ventilation may be required postoperatively due to diaphragmatic injury or ventilation problems. CPAP may be beneficial for patients extubated after stabilization (Kalaycı et al. 2017; Arakelian et al., 2011). After extubation, oxygen support via a nasal cannula should be provided until oxygen saturation returns to normal. Coughing exercises should be performed, the incision site should be supported, and secretions should be monitored (Wooten, 2009).

After surgery, patients who have undergone HIPEC may have one or more drains. The status of the tubes and drains should be assessed every 4 hours, and the amount and color of the drainage should be recorded. Initially, the color of the surgical drainage is hemorrhagic and becomes serohemorrhagic as healing begins (Wooten, 2009; Elmas and Ertem, 2017). Oral food intake is not allowed until the patient has regained normal bowel and stomach function. Until a diet can be advanced, electrolyte replacements and intravenous fluids are administered; feeding via a tube into the duodenum may be performed. The nutritional content is determined according to the patient's caloric requirements (Coccolini et al., 2014; Wooten, 2009). In patients with HIPEC, the surgical incision extends from the sternum to the pubis. The wound site should be checked for infection and properly closed in the hospital; after discharge, it may be left open (Wooten, 2009). In summary, cytoreductive surgery combined with hyperthermic intraperitoneal chemotherapy requires professional knowledge and qualified nursing care.

With this study, it was aimed to evaluate the self-care ability of patients after surgery as a result of the HIPEC in combination with CRS procedure.

MATERIAL AND METHOD

Type of Research

This study was conducted to evaluate the postoperative self-care ability of patients who underwent HIPEC in combination with CRS, using the "Self-Care Ability Scale" within a quantitative research design; it was descriptive, correlational, and cross-sectional in nature. The study was conducted in the Gastroenterology Department of a training and research hospital between January 2024 and July 2024.

Sample of the Study

The study population consisted of patients who underwent HIPEC and were hospitalized in the gastroenterology ward of a training and research hospital between January 2024 and July 2024. The sample comprised 66 eligible patients who agreed to participate in the study. As the study focused on patients treated in a specific unit during a defined period, all eligible and consenting patients available during the study period were included. The inclusion criteria were: age 18 years or older, having undergone HIPEC, ability to communicate in Turkish, and willingness to participate. The exclusion criterion was cognitive impairment.

Data Collection Tools

The study data were collected from patients hospitalized in the gastroenterology ward who had undergone oncological gastrointestinal GIS surgery. For this patient group, the data were gathered using a 20-question demographic information form developed by the researcher and the "Self-Care Agency Scale," originally developed in English by Kearney and Fleicher as a 43-item scale, later shortened to 35 items, and whose Turkish validity and reliability study was conducted by Nurşen Nahçivan (Kearney and Fleicher, 1979; Nahçivan, 1994).

Patient Identification Information Form. This form consists of 20 questions and includes items aimed at determining the participants' demographic characteristics, health status, whether they were informed about the type of treatment applied, to what extent the treatment affected their self-care, whether there was a family history of the illness, the duration of treatments, and from whom they received support.

Self-Care Ability Scale. This scale consists of 35 items, with each statement scored from 0 to 4. Individuals' orientations towards self-care were determined by participants' responses on a 5-point Likert-type scale. For the response options, "Does not describe me at all" is scored as 0, while the others are scored as follows: "Barely describes me" 1 point, "No opinion" 2 points, "Somewhat describes me" 3 points, and "Describes me very well" 4 points. In the Turkish version of the scale, eight items (items 3, 6, 9, 13, 19, 22, 26, and 31) are evaluated negatively, and their scoring is reversed. Participants can score a maximum of 140 points. A higher score on the scale indicates a higher level or strength of self-care or self-care ability of the participant. No cutoff value was used.

The original version of the scale demonstrated acceptable internal consistency reliability, and previous Turkish language equivalence studies of self-care instruments have reported Cronbach's alpha values ranging from .88 to .92. Consistent with these findings, the internal consistency reliability coefficient of the Self-Care Ability Scale in the present study was calculated as Cronbach's alpha 0.936, indicating excellent reliability for the 35-item scale in this patient sample.

Ethical Principles

Ethical approval for the study was obtained from the Kartal Koşuyolu High Specialization Training and Research Hospital Ethics Committee on 09/01/2024 (Approval No: 2024/01/767). The patient group was informed about the study, and written consent was obtained. All procedures in this study complied with the

ethical standards of the institutional and/or national research committee and with the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards. Participants were free to withdraw from the study at any time. All personal data were kept confidential, and the findings were used solely for collective reporting purposes.

Statistical Analysis

The researcher collected the data using face-to-face interviews. The collected data were analyzed using IBM SPSS Statistics 25.0 (IBM Corp., Armonk, NY, USA). The suitability of the data for a normal distribution was examined using the Kolmogorov–Smirnov test, skewness–kurtosis values, and graphical methods (histogram and Q–Q plots). Homogeneity of variances was evaluated using Levene's test. Descriptive statistics were summarized as frequency, percentage, mean, standard deviation, and minimum–maximum values. To compare differences between two independent categorical groups and the mean total score of the Self-Care Ability Scale, the Independent Samples t-test was applied when parametric assumptions were met. The relationships between continuous variables and the total scale score were analyzed using Pearson correlation analysis for normally distributed variables. In addition, the internal consistency of the Self-Care Ability Scale was assessed using Cronbach's alpha coefficient. A significance level of $p < .05$ was considered statistically significant.

FINDINGS

Of the 33 patients who participated in the study, 51.5% were women, with a mean age of 58±10.4 years. The vast majority of participants (92.4%) had a high school education or less. The average body mass index (BMI) was 24.97±16.65. It was determined that 63.6% of the participants had at least one chronic illness, and the same proportion of participants regularly used medication. According to the distribution of diagnoses, 53% of the patients underwent HIPEC due to a diagnosis of colorectal malignant neoplasms (Table 1).

Table 1. Distribution According to the Descriptive Characteristics of the Patients (n=66)

Variables	N	%
Gender		
Female	34	51.5
Male	32	48.5
Marital Status		
Single	4	6.1
Married	62	93.9
Educational Status		
High school and below	61	92.4
Undergraduate and above	5	7.6
Chronic Disease		
Yes	42	63.6
No	24	36.4

Variables	N	%
Regular Medication Use		
Yes	42	63.6
No	24	36.4
Diagnosis for Which HIPEC Was Applied		
Malignant neoplasm of stomach	5	7.5
Malignant neoplasm of ovary	15	22.7
Malignant neoplasm of colon	35	53.0
Malignant neoplasm of rectum	2	3.0
Malignant neoplasm of appendix	9	13.7
Age (Mean=58±10.4) (min 25-max 74)		
BMI (Mean=24.97±16.65) (min 19.53-max 30.85)		
Pulse (Mean=76±9.30) (min 46-max 100)		
Body Temperature (Mean=36.3±0.318) (min35.7-max 37)		
SpO_2 (Mean=98±4.27) (min 74-max 100)		

Note: Values are presented as n (%) or mean ± SD. HIPEC, hyperthermic intraperitoneal chemotherapy; BMI, body mass index; SpO_2, peripheral oxygen saturation; SD, standard deviation; min, minimum; max, maximum.

Regarding the general health status of the patients and findings related to the HIPEC procedure, 28.8% of the patients reported that they had knowledge about their disease, whereas 71.2% stated that they did not. Almost all patients (98.5%) reported receiving information about preoperative fasting, and this information was provided mostly by nurses (89.2%). Water was the most frequently reported last liquid consumed before surgery (39.4%). In addition, 81.2% of the patients stated that they knew about the HIPEC procedure, and 84.8% reported that the procedure affected their self-care. Among postoperative complaints, fatigue was the most frequently reported symptom (57.6%), followed by loss of appetite (33.3%), constipation (22.7%), diarrhea (19.7%), and nausea (10.6%). The mean fasting duration was 15±2.28 hours for liquids and 15±3.28 hours for solid foods, while the mean total length of hospital stay was 5±1.14 days (Table 2).

Table 2. Distribution of Patients' General Health Status and HIPEC Application (n=66)

Variables	N	%
Does the patient have knowledge about their disease?		
Yes	19	28.8
No	47	71.2
Did you receive information about preoperative fasting?		
Yes	65	98.5

Variables	N	%
No	1	1.5
If yes, from whom?		
Physician	7	10.8
Nurse	58	89.2
Last liquid food consumed before surgery		
Water	26	39.4
Unsweetened tea	13	19.7
Sweetened tea	3	4.5
Unsweetened coffee	6	9.1
Sweetened coffee	3	4.5
Soup with particles	1	1.5
Fruit juice	6	9.1
Clear soup	2	3
Other	5	7.6
Do you know about the HIPEC procedure?		
Yes	54	81.8
No	12	18.2
Did the HIPEC procedure affect your self-care?		
Yes	56	84.8
No	10	15.2
Constipation		
Yes	15	22.7
No	51	77.3
Diarrhea		
Yes	13	19.7
No	53	80.3
Nausea		
Yes	7	10.6
No	59	89.4

Variables	N	%
Fatigue		
Yes	38	57.6
No	28	42.4
Loss of appetite		
Yes	22	33.3
No	44	66.7
	Mean± Std. Deviation	**Min- Max**
Fasting duration after liquid intake	15±2.28	11-20
Fasting duration after solid intake	15±3.28	4-25
Total length of hospital stay	5±1.14	4-8

Note: Values are presented as n (%) for categorical variables and mean ± SD (min–max) for continuous variables. HIPEC, hyperthermic intraperitoneal chemotherapy; SD, standard deviation; min, minimum; max, maximum.

Findings on the Evaluation of Patients' Self-Care Ability After HIPEC

In this section, the Cronbach's α value of the Self-Care Ability Scale in patients and the scale findings for the applied HIPEC method are presented.

Cronbach's alpha value of the Self-Care Ability Scale. The Cronbach's α coefficient of the Self-Care Agency Scale, which consists of 35 items used in this section, was 0.936.

Self-Care Ability Scale findings

The response rates to the self-care agency scale items after HIPEC application among the participating patients were evaluated. The mean total scale score was 93±18.188. The relationships between the descriptive characteristics of the participating patients and their self-care agency after HIPEC were evaluated. As shown in Table 3, a significant difference was found between the mean total scores of the "Yes" and "No" groups regarding the presence of chronic illness among the categorical variables and the total score of the Self-Care Agency Scale ($p = .001$). This indicates that the total scores of the group without chronic illness were significantly higher than those of the group with chronic illness. According to the results regarding regular medication use, there was a significant relationship between the mean total scores of the "Yes" and "No" groups ($p = .006$). This result shows that the mean total score of the group using medication was lower than that of the group not using medication. A statistically significant relationship was detected between whether the participating patients had knowledge about HIPEC and the total scale score ($p = .001$). This difference indicates that the total scores of the "Yes" group were statistically significantly higher than those of the "No" group.

Table 3. Findings on the Relationship Between the Self-Care Agency Scale and Binary Group Variables

Binary Group Variables		**t**	**df**	**p**
Gender	Famele/Male	-1.13	64	0.263
Marital status	Married/Single	-0.595	64	0.554
Educational status	High school and below / Undergraduate and above	-0.671	64	0.504
Presence of chronic disease	Yes / No	3.59	64	**0.001***
Rregular medication use	Yes / No	-2.82	64	**0.006***
Knowledge about the disease	Yes / No	-0.823	64	0.140
Received information about preoperative fasting	Yes / No	1.49	64	0.140
Knowledge of the HIPEC procedure	Yes / No	3.89	64	**0.001***
Did the HIPEC procedure affect self-care?	Yes / No	0.361	64	0.001*
Constipation	Yes / No	-0.771	64	0.443
Diarrhea	Yes / No	0.669	64	0.506
Nausea	Yes / No	0.570	64	0.570
Fatigue	Yes / No	-0.372	64	0.711
Loss of appetite	Yes / No	-1.28	64	0.240

*p<0.005, t-Statistic (t), Degrees of Freedom (df), Independent Samples T-Test

Among the continuous variables in the descriptive data of the patients participating in the study using the self-care power scale, age was statistically significant (p=0.009). This result indicates that as age increases, the total score decreases accordingly. A positive significant relationship was found between fasting duration after solid food intake and the total score, indicating that as fasting duration increased, the total score tended to increase (p=0.036). No significant relationship was detected between the other continuous variables (pulse, body temperature, SPO2, fasting duration after liquid food, and total hospitalization duration) and the total score (Table 4).

Table 4. Findings on the Relationship Between the Self-Care Scale and Continuous Variables

Continuous Variables	Pearson's r	df	p
Age	-0.318	64	**0.009***
Pulse	-0.067	64	0.590
Body temperature	-0.006	64	0.965
SpO_2	0.023	64	0.855
Fasting duration after liquid intake	0.233	64	0.060
Fasting duration after solid intake	0.259	64	**0.036***
Total length of hospital stay	-0.116	64	0.355

**p < 0.005, Pearson's r test statistic (t), degrees of freedom (df), Pearson correlation analysis.

DISCUSSION

Peritoneal carcinomatosis (PC) is a poor-prognosis condition characterized by the uncontrolled proliferation of malignant cells on the peritoneal surface, with a median survival reported in most studies to range between 3 and 6 months. Cytoreductive surgery (CRS) and hyperthermic intraperitoneal chemotherapy (HIPEC) have been an effective combination used in the treatment of PC since the 1990s. With CRS, as described by Sugarbaker, the tumor load is surgically removed, followed by intraperitoneal perfusion of heated chemotherapy, which targets residual cells and aims to reduce systemic toxicity (Gearing et al., 2023). In the period following HIPEC, maintaining and enhancing patients' self-care abilities is critically important for both clinical outcomes and quality of life. Orem's theory emphasizes that an individual's ability to meet their own self-care needs is a determining factor in maintaining health status (Akdeniz and Özer, 2021). In this study, postoperative self-care ability was evaluated in patients who underwent CRS combined with HIPEC, and the findings were compared with those in the literature.

Regarding the age variable, our study found that self-care power scores decreased with increasing age. Systematic reviews and large-scale studies on the relationship between age and clinical outcomes have reported that advanced age can increase the risk of morbidity and/or mortality and may negatively impact the quality of life (Leimkühler et al., 2020; Turgeon et al., 2020). In this context, it is important to support the self-care of elderly patients through individualized rehabilitation, symptom management, and educational programs. Additionally, long-term QoL studies have indicated that although a decrease in QoL may be observed during the first year after SRC+HIPEC, recovery can occur over time (Stearns et al., 2018).

The relationship between nutritional status and clinical course has been frequently emphasized in the literature. Systematic reviews indicate that perioperative nutritional assessment and interventions can improve outcomes, whereas malnutrition can extend hospital stays and increase the risk of complications (Gearing et al., 2023). Although the relationship between body mass index (BMI) and complications varies among studies, some studies have associated BMI with complications (Chemama et al., 2016), while larger studies have found no significant link (Passot et al., 2017).

When examining the symptom profile, complaints such as fatigue, loss of appetite, constipation, and nausea become prominent in the early period after HIPEC. The literature reports that HIPEC can cause temporary disturbances in gastrointestinal function, and side effects such as nausea and vomiting, fatigue, pain, loss of appetite, and sleep problems are also frequently observed (Bondar et al., 2021; Sneider et al., 2023; Wang et al., 2022). Our data are consistent with this distribution of symptoms

The mean age of our sample was 58±10.4 years, with the majority being women and having less than a high school education. The demographic structure is generally similar to the distributions reported for different

samples. For example, in a cohort from Taiwan, the mean age was 60 years, the proportion of women was high, and a marked symptom burden was reported (Wang et al., 2022). Other studies have also found that among the primary cancers leading to PC, colorectal and appendix cancers are prominent (Chia et al., 2022; Sneider et al., 2023).

Overall, our findings show that self-care power in the post-HIPEC period is affected by age and symptom burden of the patient. In nursing care, the planned implementation of preoperative counseling and education, early mobilization, symptom management, and nutritional support can enhance self-care and accelerate the recovery process (Gearing et al., 2023; Akdeniz and Özer, 2021). These results suggest that nursing interventions focusing on self-care should be systematically integrated into clinical protocols.

RESULTS AND RECOMMENDATIONS

This study aimed to evaluate the postoperative self-care agency of patients who underwent HIPEC with CRS. The findings revealed that, in general, patients had a moderate level of self-care agency after HIPEC, the presence of chronic diseases and regular medication use negatively affected self-care agency, and being informed about HIPEC increased self-care agency.

These results indicate that the factors affecting self-care agency in the postoperative period should be considered in nursing care. Patients with high self-care agency are believed to experience a faster recovery process and a reduced risk of complications.

Nursing education aimed at strengthening self-care skills should be provided in the preoperative period for patients who will undergo HIPEC. In the post-HIPEC treatment period, self-care empowerment programs should be planned, especially for patients with chronic diseases and those who use medication regularly. Similar studies recommend conducting comparative and longitudinal research with larger samples and at different centers.

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