

# The risk of postoperative constipation in liver transplant patients

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## Abstract

**Aim:** This research study was carried out as a descriptive study to determine the risk of postoperative constipation in liver transplant patients.

**Material and Methods:** The study was conducted between September 2018 and November 2018 in the Liver Transplant Clinics of Liver Transplant Institute at İnönü University. The research population was composed of all of the adult patients who underwent surgery in these clinics. The sample of the study consisted of 95 patients who were selected from among these patients by using the non-random sampling method, who were able to communicate and volunteered to participate in the study. The data were collected through the face-to-face interview method using the Patient Information Form and the Constipation Risk Assessment Scale. Counts, percentages, mean scores, standard deviations, Kruskal-Wallis variance analyses, and independent samples t-tests were used to analyze data.

**Results:** Of the patents participating in the study, 65.3% were found to be in the moderate-risk group in terms of the development of constipation. Total CRAS score was found to be  $12.15 \pm 3.06$  (moderate risk). The risk of constipation was found to be significantly higher in patients who were aged 18–34, male, and high school graduates.

**Conclusion:** More than half of the liver transplant patients who participated in the study were found to be at moderate risk for the development of postoperative constipation.

**Keywords:** Liver transplant; postoperative; constipation risk.

## INTRODUCTION

Constipation is an important health problem ruining the quality of life and is common in society (1). There is no definitive definition of constipation. Clinically, constipation is identified as the signs of at least two of the following symptoms: rare bowel movements (typically 25%) and infrequency of stool, the subjective sensation of hard stool, and inadequate stool according to the Rome II and III criteria (2). Constipation is one of the functional impairments of the gastrointestinal system (3). Constipation is characterized by various symptoms also including bloating, forcing, abdominal and rectal pain, a feeling of fullness in the rectum or hard defecation, a lack of full discharge, and infrequency of stool (typically less than three times a week) (4). Constipation problem is a disorder which is common in the preoperative and postoperative period due to physiological and

psychological reasons in patients undergoing abdominal surgery (5). Although constipation does not threaten life, it is regarded as a major health problem that negatively affects the quality of life by disrupting mental and social well-being due to physical, economic and psychological pressures that it brings to individuals (1, 6). However, constipation is a common condition, care and treatment for it are still not at the desired level. The risk of constipation increases especially in patients undergoing surgery due to immobility during the treatment, dependence on the bed in the early period, the use of opioid/nonopioid analgesic drugs and the change of excretory habits (7, 8). Problem regarding bowel elimination are quite common in patients who underwent abdominal surgery. It was reported that this ratio was 25% to 40% in hospitalized patients who underwent surgery. Intestinal frequency is affected by various factors, including trauma of intestinal during the operation, alterations in dietary habits, emotional state,

**Received:** 23.07.2019 **Accepted:** 22.09.2019 **Available online:** 24.10.2019

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inactivity, prior bowel elimination history and psychological morbidity after abdominal surgery (9). As a result, constipation can become an important health issue as it has many adverse effects on the health of the individual economically, socially and psychologically. The diagnosis of constipation and the determination of the risk of its development play a key role in eliminating the problem. However, when the literature was examined, there was not sufficient number of studies determining the risk of constipation in patients. There is no study investigating the postoperative risk factors for constipation in the patients who are undergone liver transplantation. Therefore, our study is the first on this subject in the literature. In this context, this study was conducted to assess the risk of constipation in liver transplant patients and to make appropriate recommendations for surgical nurses in line with the results. The study also aimed to determine bowel elimination during postoperative period and the factors that are effective in achieving bowel elimination.

### Purpose of the Study

The aim of this study was to define constipation risk assessment and the conditions contributing to constipation risk in patients undergoing liver transplantation. The study also aimed to define whether the demographic structure or constipation-related factors affect the risk assessment score.

## MATERIAL and METHODS

### Design and sample

This study was conducted as descriptive correlational study to assess the risk of constipation after liver transplantation. The present study was carried out in a liver transplant clinics of a university hospital in Malatya between September 2018 and November 2018. The study included 95 patients who met the inclusion criteria. The inclusion criteria were as follows: 18 years of age or older, the first time to be liver transplant, mentally alert, able to communicate, no complications in the perioperative period, used the same analgesic drugs in the postoperative period and used the same mobilization procedures (including mobilizations sitting next to the bed). The exclusion criteria were as follows: with mental distress and another acute disease that caused constipation.

### Ethical Considerations

In order to carry out the study, permission were obtained from the Inonu University Liver Transplantation Institute where the study was conducted. The ethical approval was granted by Ethics Committee Selcuk University (2018/93). In addition, all patients were informed about the study and verbal consents was obtained from patients who volunteered for the study.

### Data Collection

Data were collected using a patient information form and Constipation Risk Assessment Scale (CRAS). The data collection instruments were given to the patients who were literate and were asked to fill the instruments.

The instruments were collected after they were filled. For non-literate patients, the questions contained in the data collection instruments were read by the researchers and the answers were recorded. The data collection lasted approximately 10–15 minutes for each patient.

Patient Information Form: In this form, there were nine questions to determine certain descriptive characteristics of the patients and normal bowel habit before surgery (10).

### Constipation Risk Assessment Scale

Richmond (2002) first developed the CRAS scale (11, 12). Reliability and validity of the form of the scale adapted to Turkish was carried out by Kutlu, Yılmaz, Çeçen and Eser on 152 adult patients who were treated at the surgical clinic of Celal Bayar University Hospital. The Cronbach's Alpha value, which was found to be .50 in the original scale. ICCs and values between 0.50 and 0.75 were considered moderate reliability. The total score and the sub-scale score correlations ( $r=.47-.57$ ) were also found to be significant. The Cronbach  $\alpha$  coefficient of the Turkish form was 61.9. (13). In this study, the mean of Cronbach  $\alpha$  value was calculated to be 0.71 and floor/ceiling effects were not evaluated. Constipation Risk Assessment Scale occur four sections. In each section, there were score values for the answers to the questions asked, and a total score for the section was calculated at the end of each section. The total score was obtained at the end of the scale, and each patient's constipation risk group was determined by the outcome. According to the patient's answers, the risk of the patient's constipation increased as the score value increased (Table 1). (13, 14).

Table 1. Constipation Risk	
Constipation Risk	Score
Low risk for constipation	16
Medium risk for constipation	11-15
High risk for constipation	>16

### Data Analysis

IBM SPSS Statistics Version 16.0 (Statistical Package for Social Sciences; SPSS Inc., Chicago, IL, USA) software was used for the statistical analyses of research data. Frequency, percentages, arithmetic means, standard deviations, Kruskal-Wallis variance analyses, and Student's t tests were used in the analyses. Relationships between the mean scores were determined by Pearson's correlation. The normality distribution of variables was assessed using the Kolmogorov-Smirnov test. The results were evaluated at a significance level of  $p < 0.05$ .

## RESULTS

Of the patients who participated in the study, 32.6% were between the ages of 45 and 54, 77.9% were male, 88.4% were married, 30.5% were high school graduates, 50.5% were employed, 80% lived in the province, and 74.7% did not have any additional diseases (Table 2).

**Table 2. Descriptive Characteristics of the Population of the Study (n=95)**

Characteristics	n	%
<b>Age</b>		
18–34	28	29.5
35–44	14	14.7
45–54	31	32.6
55 years and older	22	23.2
<b>Gender</b>		
Female	21	22.1
Male	74	77.9
<b>Marital status</b>		
Married	84	88.4
Single	11	11.6
<b>Educational level</b>		
Read and write	27	28.4
Primary school	20	21.1
High school	29	30.5
University	19	20.0
<b>Employment Status</b>		
Employed	48	50.5
Unemployed	47	49.5
<b>Living Place</b>		
Province	76	80.0
District	19	20.0
<b>Donor type</b>		
Living donor	86	90.5
Cadaveric donor	9	9.5
<b>Presence of Additional Diseases</b>		
Yes	24	25.3
No	71	74.7
<b>Preoperative Intestinal Habit (Weekly)</b>		
1 time	16	16.8
2 time	18	18.9
3 time	25	26.3
4 time and more	36	37.9

When the spread of the patients participating in the study were examined according to the risk groups of the Constipation Risk Assessment Scale, 65.3% were found to be in the medium risk group (Table 3).

**Table 3. Distribution of the Patients According to the Risk Groups of the Constipation Risk Assessment Scale (n=95)**

Risk Groups	n	%
Low Risk Group (score<10)	18	18.9
Medium Risk Group (score=11–15)	62	65.3
High Risk Group (score>16)	15	15.8

Considering the mean Constipation Risk Assessment Scale scores of the patients participating in the study in Table 3, it is seen that the mean lifestyle sub-scale score was 5.13±2.01, the mean hospital conditions sub-scale score was 0.63±0.93, the mean physiological/psychological status sub-scale score was 0.75±1.31, the mean medicines sub-scale score was 5.63±1.13 and the mean total scale score was 12.15±3.06 (Table 4).

Considering the mean total scores of the Constipation Risk Assessment Scale according to certain descriptive

characteristics of the patients, patients who were aged 45–54 years (13.0±2.36), male (12.63±2.74), high school graduates (13.48±2.57), and had additional diseases (15.16±1.30) were found to have a statistically significant higher risk of postoperative constipation (Table 5).

**Table 4. Patients' Constipation Risk Assessment Scale Total and Sub-scale Mean Scores (n=95)**

Total and Sub-scales	Scale	Minimum – Maximum	Mean±SD
Lifestyle	0 – 11	1 – 8	5.13±2.01
Hospital Conditions	0 – 4	0 – 2	0.63±0.93
Physiological/ Psychological Status	0 – 18	0 – 3	0.75±1.31
Medicines	0 – 30	3 – 7	5.63±1.13
Total Score	0 – 63	6 – 16	12.15±3.06

**Table 5. Patients' Constipation Risk Assessment Scale Total and Sub-scale Mean Scores According to Certain Descriptive Characteristics (n=95)**

Characteristics	CRAS, Mean±SD	Test Value and p
<b>Age</b>		
18–34	11.50±3.33	
35–44	11.42±3.69	KWx <sup>2</sup> =3.444 *p=.032
45–54	13.0±2.36	
55 years and older	12.27±3.04	
<b>Gender</b>		
Female	10.47±3.57	t=4.68
Male	12.63±2.74	*p=.033
<b>Marital status</b>		
Married	12.04±3.09	t=1.173
Single	13.0±2.79	p=.679
<b>Educational level</b>		
Read and write	11.92±2.85	
Primary school	9.70±3.26	KWx <sup>2</sup> =18.325 *p=.000
High school	13.48±2.57	
University	13.05±2.29	
<b>Employment Status</b>		
Employed	12.66±3.11	t=0.443
Unemployed	11.63±2.95	p=.507
<b>Living Place</b>		
Province	12.36±3.11	t=0.705
District	11.31±2.76	p=.403
<b>Donor Type</b>		
Living donor	15.59±3.01	t=0.031
Cadaveric donor	15.11±3.25	p=.652
<b>Presence of Additional Diseases</b>		
Yes	15.16±1.30	t=9.798
No	11.14±2.80	*p=.002
<b>Preoperative Intestinal Habit (Weekly)</b>		
1 time	16.62±3.09	
2 time	15.55±3.39	KWx <sup>2</sup> =2.263 p=.520
3 time	15.16±2.67	
4 time and more	15.33±3.04	

Note. CRAS= Constipation Risk Assessment Scale \*p<.05

## DISCUSSION

This study examined factors affecting the risk of constipation in patients undergoing major liver surgery as well as CRAS. The study also defined whether demographic characteristics and other variables related to constipation risk effect the CRAS. In the literature, there are many studies in which constipation of patients who have undergone surgical intervention is stated (8,10,15,16).

In the study, 65.3% of the patients were found to be in the moderate-risk group when their distribution according to the Constipation Risk Assessment Scale was examined. It was thought that the reason why more than half of the patients were in the moderate-risk group could be due to the stress and irritation of the bowel movements during the liver transplantation.

The patients' mean total score of the CRAS was  $12.15 \pm 3.06$  and was found to be in the moderate-risk group. Similarly, Kutlu et al. (2011) found the mean total Constipation Risk Assessment Scale score as  $12.4 \pm 4.2$  in their study. In addition a study by Çelik et al. (2015) reported that patients undergoing abdominal surgery the mean total CRAS score as  $11.71 \pm 7.81$  (9). Risk was determined only in patients with in general surgery patients to be  $12.9 \pm 4.8$  (17). Most of these findings are thought to be because of factors such as lack of movement observed in the patients, fluid intake and pharmacological agents. The results showed similarity with the previous studies (9,18,19).

In this study, it was found that the risk of constipation increased as the age advanced (45 ages and older), and that this situation was also statistically significant. Constipation/risk is not a physiologic consequence of normal aging in the literature. Many age-related problems (for example, reduced mobility, comorbid medical conditions, increased use of drugs with a side-effect profile including constipation, and changes in diet) may contribute to the prevalence of constipation in older adults (10, 20). In their study to determine the risk of postoperative constipation in orthopedics patients, Şendir et al. (2012) have found that the risk of constipation increases as the age advances. In their literature review study, McCrea et al. have determined that the prevalence of constipation rises after the age of 50 and that the biggest increase is after the age of 70 (21). The findings of the present study parallel these results. It is thought that the decrease in physical activity, decline of physiological functions, increase in medical problems and increased drug use increase the risk of constipation.

It is emphasized in the literature that constipation is seen more frequently in women than in men (10,17,21,22). The findings of the present study are different from literature. In this study, it was found that the risk of constipation was lower in women than in men, and that this result was statistically significant. ( $p=0.33$ ).

Many studies have shown that educational level affects the incidence of constipation. As the educational level increases, the incidence of constipation is reported

to decrease (23). In this study, we demonstrated that patients who had higher educational attainment had higher constipation risk. The effect of educational level on the risk of constipation was found to be statistically significant in this study ( $p=.000$ ). Ross and Wu (1995) found that well-educated people have more control over their lives and health and have higher levels of social support (24).

In this study, it was found that the risk of constipation increased as the presence additional disease, and that this situation was also statistically significant. Klingman (2009) suggested that chronic diseases (such as chronic bowel disease, depression, diabetes), illnesses such as hypothyroidism, hypocalcemia, or hypokalemia, neurological conditions that block nerve impulses to the colon (e.g., spinal cord injury, tumor) and long bed rest may cause intestinal elimination problems of individuals (25).

It has been reported in the literature that decreasing repulsive colon contractions decreases the frequency of defecation, which leads to colorectal enlargement and increases the risk of constipation. [26]. However, in this study, the effect of preoperative defecation frequency on postoperative constipation risk was not found to be statistically significant.

## CONCLUSION

This study viewed the postoperative constipation risk assessment of Turkish liver transplant patients. Based on this study, more than half of the patients were found to be at moderate risk for the development of postoperative constipation. Therefore, patients' stay in hospital would increase as well as the risk of morbidity due to the lack of appropriate treatment and care before surgery. In line with these results, it is recommended that individuals be given more information by nurses before surgery. Nurses should assess especially the patients with such characteristics in terms of the possibility of developing constipation and take the necessary precautions.

*Competing interests: The authors declare that they have no competing interest.*

*Financial Disclosure: There are no financial supports.*

*Ethical approval: Selcuk University Ethics Committee (2019/93). Approval was taken from the Inonu University Liver Transplantation Institute.*

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