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Quality of Life and Anxiety Status following Donor Liver Transplantation

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Abstract

Study objective: Anxiety disorder, which is encountered in surgical patients receiving general anesthesia is a psychological and physical condition, characterized by sudden onset of hazard perception and extensive fear, and may lead to panic disorder. In this study, we aimed to determine anxiety levels of liver transplantation donors via a questionnaire and reveal their quality of life and anxiety status during the 1st postoperative day and month.

Design: Prospective observational study.

Setting: In the critical care.

Patients: Following the Ethics Committee approval, forty subjects of both sexes, between the ages of 18 and 75 years, who were on the list of liver transplant donors were included in the study.

Interventions: A 10-item anxiety and quality of life questionnaire was prepared using scales applied to surgical patients, such as the Amsterdam Preoperative Anxiety and Information Scale for preoperative anxiety, the Spielberger State-Trait Anxiety and Inventory and the Profile of Mood States on the 1st postoperative day and month.

Measurements: Data regarding the donor's age, sex, marital status, educational background, history of previous surgeries, the degree of affinity between donor and the recipient, number and age of their children, and duration of patient's disease were recorded.

Main results: On the first day and in the first month, the total score on questions "I am worried about anesthesia" was significantly lower than the total scores on the questions "I am worried about the success of the surgical procedure" and "I am worried about the risk of anesthesia-related mortality" ($p = 0.007$ and $p = 0.001$, respectively).

Conclusions: Many living donors are motivated to make their decision on this procedure in a short time. We believe that allocating more time to informing patients and donors and holding information meetings on anesthesia and surgical procedures at intervals may be beneficial.

Keywords

Liver transplantation, Anxiety, Quality of life, Survey

Introduction

Anxiety disorder in patients after anesthesia, is a psychological and physical condition which is characterized by sudden onset of hazard perception and extensive fear and can lead to panic disorder. The first living donor liver transplantation (LDLT) was performed in 1989 and LDLT has recently attained a stable place in surgical treatment of the end-stage liver diseases [1].

Living organ donation has a significant risk of morbidity and mortality without having a surgical gain. In several studies, it was shown that 40% of donors experience a complication [2]. Most of them are categorized as Clavien grade I or II and 95% improvement is achieved in the first year after surgery [3]. However donor liver transplantation has a potential for lifelong impact on donors' both psychosocial and medical status [4]. Besides the Japanese Liver Transplantation Society reported that, in the first year following surgery, 10% of donors might still have several physical symptoms [5].

Donor's decision requires a strong emotional and mental anguish including their responsibility and rela-

tionships between family members [6,7]. Therefore the team should pay attention for their perioperative circumstances.

The improvement of the survival rates of donors have increased the interest for measuring the quality of life and anxiety scores [8,9]. Previous studies concluded that there is a significant correlation between the impaired quality of life and psychiatric morbidity [10]. Despite those adverse effects, psychological changes experienced by the liver transplantation patients might be ignored. In order to prevent such changes and decrease the rate of mortality related to patient's psychological condition, psychological care units have begun to be established in transplant centers [11,12]. Although previous studies in this field primarily focused on liver transplant recipients, there is an increase in the researches regarding the quality life and mood changes of donors, such as anxiety and depression [13,14].

There are some scales used for measuring perioperative anxiety level. The Amsterdam Preoperative Anxiety and Information Scale (APAIS) [15], the Spielburger State-Trait Anxiety and Inventory (STAI) [16], and Anxiety-Visual Analog Scale (VAS) enable quantitative measurement of anxiety level. Additionally, The Profile of Mood States (POMS) [5] is the scale used for patients undergoing hepatic transplantation. The aim of the present study was to determine anxiety levels of liver

donors and reveal their quality of life and anxiety status during the 1st postoperative day and the 1st postoperative month via aforementioned scales and the questionnaire prepared within the scope of the study.

Materials and Methods

Following the approval of the Hospital Ethics Committee and patients' written informed consents, 40 subjects of both sexes, between 18 and 75 years, on the list of liver transplant donors were included in the study. Patients taking psychotropic medication and having a psychiatric or neurological disease or having difficulty in understanding the principles of study were excluded. Patients' data including age, sex, marital status, number and age of their children, educational background, history of previous surgeries, and the degree of affinity with the recipient and duration of disease suffered by the recipient were recorded. On the 1st day and 1st month, patients were asked to fill in a 10-item questionnaire (Table 1). Patients scored the first nine questions using a five-level Likert scale. Patients were not administered any anxiolytics either in preoperative or in postoperative period. Patients' ratings on questions related to anesthesia or surgery were separately calculated and compared. Also, the presence of nausea and vomiting, and the pain levels were determined and recorded. Patients rated their pain intensity on a 100 mm Visual Analogue Scale (VAS).

Statistical Method

Statistical analyses were conducted with the Statistical Package for the Social Sciences (SPSS) version 21.0. The Kruskal-Wallis test and the Mann-Whitney u test were used for analyzing qualitative data while repeated measurements were evaluated using the Wilcoxon test.

Results

Three patients were excluded from the study and the data of 37 patients were analyzed. There was no significant difference between patients in regard to patient demographics, educational and marital status (Table 2). The score on the question [I wanted to have information about anesthesia] was significantly higher on the 1st day compared to the 1st month ($p = 0.004$). There was not a significant difference between the 1st day and 1st month regarding the scores of the other questions. The scores on the question of 'Pain Score' was significantly higher on the 1st day than in the 1st month ($p < 0.05$). The rates of nausea and vomiting did not show any significant difference in the 1st day and 1st month ($p > 0.05$) (Table 3). On the 1st day and in the 1st month, the total score on the questions [I am worried about anesthesia] and [I wanted to be informed as much as possible about anesthesia] was significantly lower than the total score on the questions [I am worried about the success of the surgical procedure] and [I wanted to be informed as much as possible about surgical procedure] ($p < 0.05$) (Table 4). Additionally, on the 1st day and in the

Table 1: The survey questions.

Kindly give the answer which seems to describe your present feelings best

1 = not at all 2 = somewhat 3 = moderately so 4 = very much so 5 = completely

1. I was worried about anesthesia

1...2...3...4...5

2. I wanted to be informed as much as possible about anesthesia

1...2...3...4...5

3. I was worried about the success of the surgical procedure

1...2...3...4...5

4. I am worried about the recipient's risk of anesthesia-related mortality

1...2...3...4...5

5. I wanted to be informed as much as possible about the surgical procedure

1...2...3...4...5

6. I feel secure

1...2...3...4...5

7. I am in sense of regret

1...2...3...4...5

8. I was worried about my future

1...2...3...4...5

9. I feel relaxed

1...2...3...4...5

10. Do you have?

Pain (0-100):

Nausea and vomiting:

Table 2: Patient demographics, educational and marital status (mean \pm sd).

		Min	Max	n (%)
Age (year)		19	5	33.57 \pm 9.05
Gender	Female			14 (37.8%)
	Male			23 (62.2%)
Education level	Primary school			8 (21.6%)
	High school			11 (29.7%)
	University			18 (48.6%)
Marital status	Single			18 (48.6%)
	Married			19 (51.4%)
Children	No			19 (51.4%)
	Yes			18 (48.6%)
Etiology	Alcohol			6 (16.2%)
	Infection			20 (54.1%)
	Other			11 (29.7%)
Previous surgery	No			20 (54.1%)
	Yes			17 (45.9%)
Degree of kinship	1 st degree			9 (24.3%)
	2 nd degree or more			28 (75.7%)
Length of disease (year)		2 months	20 years	5.29 \pm 5.44

Table 3: The evaluation of survey questions, pain scores and incidence of nausea and vomiting (mean \pm sd).

		min-max	n (%)	p
I was worried about anesthesia	1 st day	1 - 4	1.70 \pm 1.10	0.101
	1 st month	1 - 3	1.4 \pm 0.7	
I wanted to be informed as much as possible about anesthesia	1 st day	1 - 5	1.68 \pm 1.03	0.004
	1 st month	1 - 5	1.24 \pm 0.76	
I was worried about the success of the surgical procedure	1 st day	1 - 5	2.11 \pm 1.10	0.254
	1 st month	1 - 5	1.89 \pm 1.37	
I am worried about the recipient's risk of anesthesia-related mortality	1 st day	1 - 5	2.81 \pm 1.45	0.106
	1 st month	1 - 5	2.46 \pm 1.41	
I wanted to be informed as much as possible about the surgical procedure	1 st day	1 - 5	2.19 \pm 1.49	0.164
	1 st month	1 - 5	2.51 \pm 1.52	
I feel secure	1 st day	1 - 5	4.16 \pm 1.36	0.755
	1 st month	0 - 5	4.27 \pm 1.43	
I was worried about my future	1 st day	1 - 5	2.00 \pm 1.18	0.083
	1 st month	1 - 5	1.59 \pm 0.93	
Pain score	1 st day	0 - 100	16.22 \pm 8.77	0
	1 st month	0 - 100	3.78 \pm 4.63	
Nausea and vomiting	1 st day		4 (10.8%)	0.125
	1 st month		0 (0.0%)	
Wilcoxon test				

Table 4: The comparison of Anesthesia Sum and Surgery Sum (mean \pm sd).

	Anesthesia Sum	Surgery Sum	p
1 st day	3.38 \pm 1.83	4.30 \pm 1.87	0.007
1 st month	2.68 \pm 1.13	4.41 \pm 2.41	0

Table 5: The comparison of question 1 and 4.

	Question 1	Question 4	p
1 st day	1.70 \pm 1.10	2.81 \pm 1.45	0.001
1 st month	1.43 \pm 0.69	2.46 \pm 1.41	0.001

Question 1: I was worried about anesthesia.

Question 4: I was worried about the recipient's risk of life depending on anesthesia.

1st month, the total score on the question [I am worried about anesthesia] was significantly lower than the score on the question [I am worried about the recipient's risk of anesthesia-related mortality] ($p < 0.05$) (Table 5).

The scores given to the questions [I am worried about the recipient's risk of anesthesia-related mortality], [I feel secure] and [I was worried about my future] did not show any difference according to sex, age, marital status, whether they have children or not, educational background, whether they had operation before or not, the degree of kinship, and the reasons of referral ($p > 0.05$).

The scores on the questions [I am worried about anesthesia] and [I wanted to be informed as much as possible about anesthesia] showed no significant difference on the 1st day and 1st month regarding patients' sex, age, marital status, educational background, degree of kinship and reasons of the referral, whether they have children or not, and whether they had operation previously or not ($p > 0.05$) (Table 6).

There was no significant difference between the

Table 6: Comparison of the scores on questions related with anesthesia (mean \pm sd).

		1 st day		1 st month	
		r	p	r	p
Gender	Female	3.13 \pm 1.52	0.588	2.57 \pm 0.79	0.912
	Male	3.79 \pm 2.26		2.86 \pm 1.56	
Age		-0.19	0.261	-0.009	0.956
Marital status	Single	3.50 \pm 1.95	0.532	2.78 \pm 1.00	0.283
	Married	3.26 \pm 1.76		2.58 \pm 1.26	
Children	No	3.39 \pm 1.88	0.844	2.78 \pm 1.40	1
	Yes	3.37 \pm 1.83		2.58 \pm 0.84	
Educational Level	Primary school	2.88 \pm 1.81	0.335	2.75 \pm 1.16	0.801
	High school	3.09 \pm 1.58		2.45 \pm 0.82	
	University	3.78 \pm 1.99		2.78 \pm 1.31	
Previous surgery	No	2.88 \pm 1.54	0.129	2.82 \pm 1.42	0.816
	Yes	3.80 \pm 1.99		2.55 \pm 0.83	
Degree of kinship	1 st degree	3.32 \pm 1.76	0.954	2.71 \pm 1.15	0.532
	2 nd degree and more	3.56 \pm 2.13		2.56 \pm 1.13	
Etiology	Alcohol	2.33 \pm 0.52	0.222	2.17 \pm 0.41	0.086
	Infection	3.80 \pm 1.88		3.05 \pm 1.36	
	Other	3.18 \pm 2.04		2.27 \pm 0.65	
Length of disease (year)		-0.188	0.264	0.088	0.604

Kruskal-Wallis/Mann-whitney u test/Spearman correlation.

Table 7: Comparison of the scores on questions related with surgical procedure (mean \pm sd).

		1 st day		1 st month	
		r	p	r	p
Gender	Female	3.83 \pm 1.59	0.079	3.78 \pm 1.7	0.134
	Male	5.07 \pm 2.09		5.43 \pm 3.06	
Age		0.018	0.917	0.024	0.886
Marital status	Single	3.78 \pm 1.86	0.062	4.06 \pm 1.98	0.552
	Married	4.79 \pm 1.78		4.74 \pm 2.77	
Children	No	4.5 \pm 1.65	0.38	4.67 \pm 2.61	0.574
	Yes	4.11 \pm 2.08		4.16 \pm 2.24	
Educational level	Primary school	3.88 \pm 1.89	0.051	3.13 \pm 2.1	0.058
	High school	3.36 \pm 1.36		4.27 \pm 2.8	
	University	5.06 \pm 1.89		5.06 \pm 2.15	
Previous surgery	No	4.24 \pm 1.82	0.888	4.12 \pm 2.64	0.323
	Yes	4.35 \pm 1.95		4.65 \pm 2.23	
Degree of kinship	1 st degree	4.21 \pm 1.69	0.841	4.43 \pm 2.46	0.884
	2 nd degree and more	4.56 \pm 2.46		4.33 \pm 2.4	
Etiology	Alcohol	3.83 \pm 1.33	0.863	5.33 \pm 1.63	0.239
	Infection	4.4 \pm 2.04		4.5 \pm 2.8	
	Other	4.36 \pm 1.91		3.73 \pm 1.9	
Length of disease (year)		0.076	0.833	0.036	0.833

Kruskal-Wallis/Mann-whitney u test/Spearman correlation.

scores given to the questions [I am worried about the success of the surgical procedure] and [I wanted to be informed as much as possible about surgical procedure] regarding sex, age, marital status, whether patients have children or not, their educational background, history of previous surgeries, the degree of kinship, and the reasons of referral ($p > 0.05$) (Table 7).

Discussion

This study has revealed that liver donors are more anxious about anesthesia than surgery, and give more importance to the survival of liver recipients. Medical teams working in transplantation units are more conscious today and giving more importance to carrying

psychological analyses for patients in the perioperative period [17,18]. A previous questionnaire survey including 400 patients has indicated that 81% of the patients suffered from preoperative anxiety [19]. The fear of postoperative pain was identified as the most common source of preoperative anxiety (84%) which was followed by the fear of the failure of postoperative recovery (64.8%), with nausea and vomiting. In the same study, the anxiety rate was found to be higher in female patients. Nevertheless, in the present study donor anxiety related to his/her own life and recipient's life did show a change regarding sex, age, marital status, having children, educational status, degree of kinship and reason of the referral or whether they had operation

earlier. Although Jin, et al. [13] reported that especially age and sex affected the level of donor's postoperative quality of life, no correlation was found between the quality of life and the aforementioned variables in the present study. Sleep disorders were also reported [20].

This study differs from other similar studies in that it compares the anxiety of anesthesia with surgery. The rate of patients who were anxious and wanted to have more information about anesthesia was significantly higher than the rate of patients who were anxious and wanted to have more information about the surgery. However, sex or other factors did not have any influence on the anxiety level. In our study, patients counted on the surgical team and that might be one of the factors decreasing the anxiety against potential surgical complications. The score on the question 'I wanted to be informed about anesthesia' was significantly higher on the 1st day compared to the 1st month. Therefore, it can be concluded that patients' anxiety level can be decreased by providing them with accurate information on the surgical procedure in the early preoperative period.

Donors are individuals who are both mentally and physically healthy. The idea of helping a person in need by means of a surgery may cause anxiety for a healthy person. However, the donors in our study had lower anxiety about their surgeries compared to the anxiety they had about anesthesia-related mortality risk of recipients. It may be correlated with that all donors were at a certain level related to recipients. On the other hand, the donors included in our study thought that recipients were in the end-stage of the disease and they are the only opportunity for those recipients. That may be the reason why they were more concerned about recipients. At the same time, that way of thinking may have probably led donors to ignore potential surgical complications and health problems which they may suffer from due to transplant surgery. As stated in Weng, et al. [21] donors might have felt that they could deal with potential complications as they were in good health. It was, however, reported that one third of donors were uncertain about hepatectomy and that uncertainty played a role in development of anxiety [22]. Those donors who do not have enough time to make a decision may show depression symptoms [23]. On the other hand the survival of the recipient play an active role on donor's unwillingness to donate again [24]. According to DuBay, et al. [25] researchers should pay more attention to the donors who have been diagnosed with psychiatric disorders or who are young or have had further education.

One limitation of the study concerns the analysis of anxiety. To put in another way, in this study patients' anxiety levels were analyzed only in the postoperative period and preoperative anxiety was not considered. As donors had many questions and uncertainties on their mind in the preoperative period and were supposed to make decisions within very limited time, we did not

want to have any influence on their decision making process. For this reason, we decided that analyzing anxiety in the postoperative period would bear more elective results for the study.

Although the anxiety developing in patients who received anesthesia for surgical procedures is functional and healthy to a certain extent, high perioperative anxiety is found to be correlated with not only increased morbidity and mortality but also increased need for anesthetics. Also, it has a direct effect on the duration of hospitalization, patient satisfaction, and the level of stress and postoperative pain [26,27]. Previous studies gave priority to liver transplantation; however, recent studies have started addressing donor-related issues, such as mood changes, like depression and anxiety, and the quality of life. Mortality rate was reported as 0.2% for donors [28]. It is a substantial ratio and indicates that the quality of health should be ensured not only for recipients but also for donors. We believe that conducting intermittent meetings and regular follow-ups in the postoperative period will be useful in decreasing that ratio.

Conclusion

Many living donors are motivated to make their decision on this procedure in a short time. While donors were more anxious about surgical risks, recipients had higher anxiety about the risk of anesthesia-related mortality. Thus, it can be concluded that allocating more time to informing patients and donors and organizing information meetings on anesthesia and surgical procedures may be helpful in decreasing anxiety.

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