ORIGINAL ARTICLE

TJG
The Turkish Journal of Gastroenterology

Assessment of living donors with respect to pre- and posttransplant psychosocial properties and posttransplant family functioning in pediatric liver transplantation

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Background/aims: *We aimed in this study to investigate pre- and posttransplant clinical and psychosocial features of the donors and the effects of living-related liver transplantation and possible relevant factors on psychosocial outcome and family functioning.* ***Methods:*** *Thirty-two living donors (19 females, age 31.84 ± 7.10 years) were evaluated. Medical records of donors regarding pre- and posttransplant clinical and psychological features and family life were evaluated.* ***Results:*** *The donors were parents (n=28, 87.6%) in most. In the pretransplant evaluation, 5 donors (19.3%) had anxiety regarding postoperative complications and quality of life. Donors were discharged from the hospital in a median of 7 days (range, 5-30 days). Return to work and feeling of complete well-being were accomplished in a median of 4 weeks (range, 1-32 weeks) and 10 weeks (range, 4-48 weeks), respectively. Sixteen recipients (50.0%) suffered from major complications, and 3 (9.4%) required invasive intervention. Fourteen donors (43.4%) reported pain around the surgical incision and nonspecific gastrointestinal problems postoperatively. Psychological problems were observed in 8 donors (25.0%); 2 (6.3%) had depression requiring drug and psychotherapeutic intervention. Psychological disruption was found to be correlated with the presence of problems in the recipient (p<0.01, r=0.487). The donors' relationship with the recipient was negatively affected in 1 (3.1%), but improved in 15 (46.9%) cases. Nine donors (34.6%) displayed nervous behavior toward their spouses, and 2 (7.7%) later divorced. Life of the other family members was negatively affected in 8 (30.7%). Two donors' spouses (7.7%) failed to carry out domestic responsibilities.* ***Conclusions:*** *Psychological disturbance and abnormal family functioning are frequently observed during the posttransplant period. Therefore, psychologic assessment and evaluation of family functioning should be regularly repeated during the posttransplant period.*

Key words: Pediatric liver transplantation, living donor, psychosocial outcome, family functioning

Pediatrik karaciğer nakillerinde canlı vericilerin nakil öncesi ve sonrası psikososyal özelliklerinin ve nakil sonrası ailevi işlevlerin değerlendirilmesi

Amaç: *Karaciğer vericilerinin nakil öncesi ve sonrası klinik ve psikisosyal özelliklerinin değerlendirilmesi, canlı vericiden karaciğer naklinin ve olası ilişkili faktörlerin psikososyal sonuçlar ve ailevi işlevler üzerine etkisinin değerlendirilmesi amaçlanmıştır.* ***Yöntem:*** *Çalışmada 32 (19 bayan, yaş 31.84±7.10 yıl) karaciğer vericisi değerlendirildi. Nakil öncesi ve sonrası klinik, psikososyal özellikler ve aile hayatı değerlendirildi ve bulguların tanımlayıcı analizi yapıldı. Psikolojik bozukluk ya da ailevi işlevler üzerine etkisi olabilecek faktörler için Pearson korelasyon testi uygulandı.* ***Bulgular:*** *Vericiler çoğunlukla ebeveyndi (n=28, %87.6). Nakil öncesi 5 vericinin (%19.3) nakil sonrası komplikasyonlar ve hayat kalitesi üzerine endişeleri vardı. Vericiler mediyan 7 günde (aralık, 5-30 gün) taburcu oldu. İşe dönüş ve tam iyilik hali sırasıyla mediyan 4 hafta (aralık, 1-32 hafta) ve 10 haftada (aralık, 4-48 hafta) idi. Onaltı vericide (%50) majör komplikasyon oldu, 3'ünde (%9.4) girişimsel işlem gerekti. Ondört verici (%43.4) ameliyat skarı etrafında ağrı ve nonspesifik gastrointestinal sorunlardan şikayetçi idi. Psikolojik sorunlar 8 vericide (%25.0) gözlendi. İki vericide (6.3%) depresyon nedeniyle ilaç ve psikoterapötik destek gerekti. Psikolojik bozukluklar vericideki sorunlarla ilişkili bulundu (p<0.01, r=0.487). Vericinin alıcı ile ilişkisi 1'inde (%3.1) olumsuz yönde etkilendi, ancak 15'inde (%46.9) daha iyi oldu. Dokuz verici (%34.6) eşine karşı sinirli davranış değişikliği geliştirdi ve 2 verici (%7.7) boşandı. Diğer aile bireylerinin yaşamları 8'inde olumsuz yönde etkilendi. İki vericinin eşi (%7.7) nakil sonrası ailevi sorumluluklarını yerine getirmede başarısız oldu.* ***Sonuç:*** *Karaciğer vericilerinde posttransplant dönemde, psikolojik sorunlar sık olarak gözlenmektedir. Bu nedenle, posttransplant dönemde vericiler düzenli olarak psikososyal açıdan değerlendirilmeli, psikolojik bozukluk riski altındakiler daha yakın izlenmelidir. Canlı vericiden karaciğer naklinin posttransplant dönemde evlilik ve aile hayatı üzerine olumsuz etkileri olabilmektedir. Ailevi işlevlerin düzenli olarak değerlendirilmesi, gereken durumlarda aile terapisi, ailevi işlevlerdeki bozukluk sıklığını azaltabilir.*

Anahtar kelimeler: Çocuklarda karaciğer nakli, canlı verici, psikososyal sonuçlar, ailevi işlev

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Manuscript received: 09.01.2010 **Accepted:** 16.03.2010

Turk J Gastroenterol 2011; 22 (1): 36-41
doi: 10.4318/tjg.2011.0154

INTRODUCTION

Liver transplantation is an accepted therapy for irreversible acute and chronic liver disease, and has dramatically changed the prognosis of children dying of liver failure. The majority of liver grafts are retrieved from heart-beating cadavers. However, it may not be possible to find suitable organs for children. Thus, the shortage of suitable cadaveric organ donors for children led to living-related liver transplantation (LRLT) in the early 1990s (1,2). LRLT has several potential advantages. First, it reduces waiting list mortality. Second, it allows optimal timing of transplantation as an elective procedure and reduces the stress of waiting for a suitable organ. Third, the graft is obtained from a healthy individual with minimal preservation injury (3). However, this procedure exposes the donor, a perfectly healthy individual, to the risk of morbidity and even mortality (4, 5). It raises some concerns about the quality of life and may cause psychological problems in the posttransplant period. Only a few data are available on family functioning. Extreme stress experienced by families during the posttransplant period may cause marital failure and dysfunctional family behavior (6).

Here, we aimed to investigate the pre- and posttransplant clinical and psychosocial features of the donors and the effects of LRLT and possible relevant factors on the psychosocial outcome and family functioning.

MATERIALS AND METHODS

Thirty-two liver donors who underwent surgery between 1999 and 2007 in the Hepatopancreatobiliary Unit of Istanbul University, Department of General Surgery, for the purpose of LRLT were included in the study. Duration of posttransplant follow-up was a median of 27 months (range, 8-84 months).

All the donors had undergone detailed medical and formal psychological evaluation before transplantation. The data regarding posttransplant psychosocial outcome and family life were documented from a chart review. Medical records of the donors and recipients regarding the demographic features, pre- and posttransplant follow-up and other medical outcomes were reviewed. Medical complications were classified according to the Clavien grading system (7) as follows: grade 1: An alteration from ideal postoperative course with complete recovery or which can be easily controlled; grade 2: Any complication that is potentially life-threatening or results in intensive care unit (ICU) stay ≥5 days or hospital stay ≥4 weeks, but which does not result in residual disability or persistent diseases; grade 3: Any complication with residual or lasting functional disability; and grade 4: Complications that lead to retransplantation or death.

Results were assessed in a descriptive manner. Pearson's correlation test was used to investigate the correlation of possible relevant factors with psychological disruption and with family functioning.

RESULTS

The study group included 19 females (59.4%) and 13 males (40.6%) with a mean age of 31.84 ± 7.10 years at donation (range, 21-55 years). The donors were parents (n=28, 87.6%), grandmother (n=1, 3.1%), grandfather (n=1, 3.1%), cousin (n=1, 3.1%), and sibling (n=1, 3.1%) of the recipients (Figure 1). Only 5 donors (15.6%) had an idea about the living-related transplantation beforehand. All the donors and their families agreed to organ donation. Seven donors (21.9%) had displayed anxiety regarding postoperative complications and quality of life during the formal psychological evaluation, but none of them needed any therapeutic approach.

The median length of hospital stay for the donor surgery was 7 days (range, 5-30 days). Donors returned to their original occupation in a median of 4 weeks (range, 1-32 weeks) and complete well-being was achieved in a median of 10 weeks (range, 4-48 weeks).

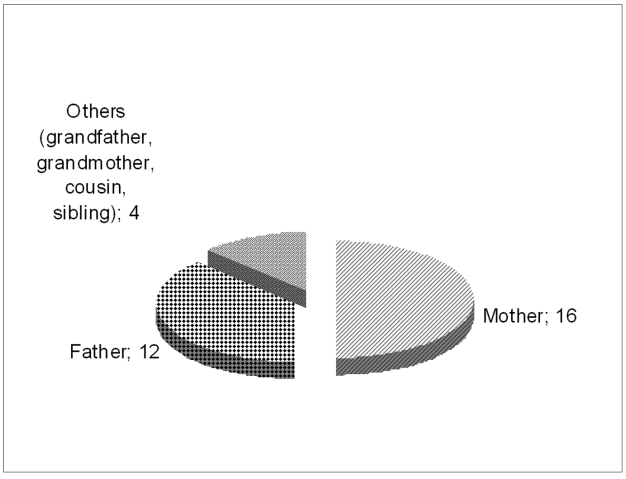

Figure 1. Donor's relationship to recipient.

Major complications that could not be managed by conservative means and required invasive intervention were observed in 3 donors (9.4%; liver abscess, pleural effusion, intraabdominal fluid collection). Postoperative complaints reported by 14 donors (43.4%) were mainly pain around the surgical incision and gastrointestinal problems like nausea, vomiting, anorexia, and dyspepsia (Figure 2a).

Sixteen recipients (50.0%) suffered from major complications. These were biliary problems (n: 5), vascular problems (n: 3, hepatic artery thrombosis, portal vein thrombosis), hemorrhage (n: 4, liver cut surface), sepsis (n: 2), and others (n: 3, pulmonary problems necessitating tracheostomy, hyperglycemia requiring insulin use more than 30 days, Kaposi sarcoma) (Figure 2b).

Psychological problems were observed in 8 donors (25.0%), and included lowered mood in 4 (12.5%) and anxiety disorders in 2 (6.3%), which did not require any therapeutic intervention other than formal psychological support. However, major depression necessitating drug and psychotherapeutic intervention was observed in 2 donors (6.3%) (Figure 3).

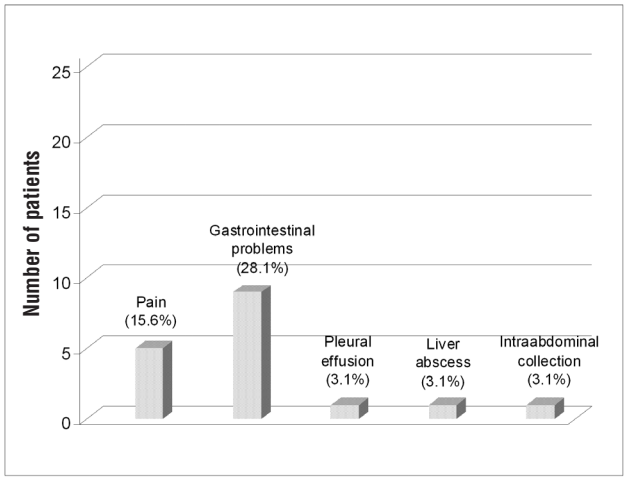

Figure 2a. Donor complications.

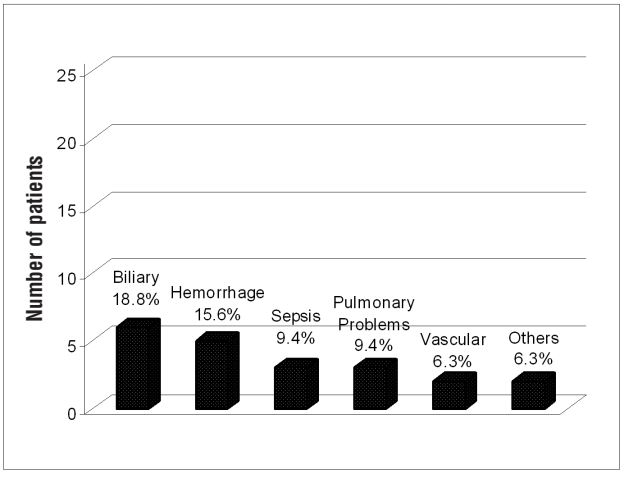

Figure 2b. Recipient complications.

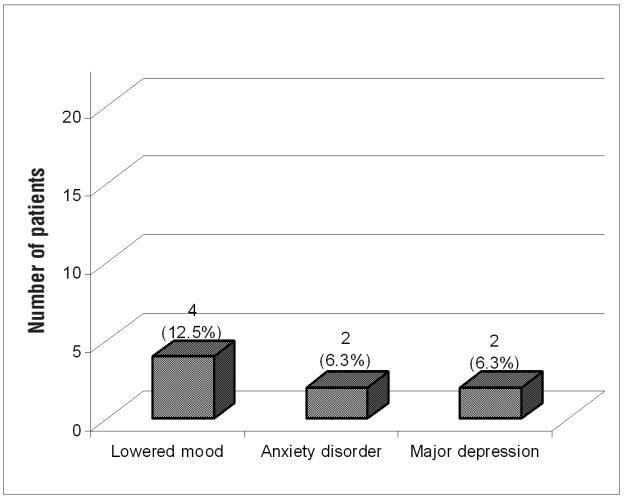

Figure 3. Psychological problems in donors.

Psychological disruption in donors was not correlated with the presence of medical problems or pretransplant anxiety in donors. On the other hand, there was a strong correlation between psychological disruption and presence of problems in the recipient ($p<0.01$, $r=0.487$) (Table 1).

Whereas all the donors acknowledged that they would donate again if required, 2 donors (6.3%) whose recipients were on the waiting list for retransplantation due to biliary problems had shown ambivalence and expressed their regret about donation. The donors' relationship with the recipient was reported as being negatively affected in 1 (3.1%), but improved in 15 (46.9%) cases.

Table 1. Investigation of the correlation between psychological disruption in donors and possible causative factors

n=32	Psychological disruption (p)	Pearson correlation (r)
Presence of medical problems of recipients	<0.01	0.487
Presence of medical problems of donors	NS	0.037
Pretransplant anxiety in donors	NS	-0.142

Family functioning was evaluated in 26 donors with respect to their relationship with their partner and family life. Nine donors (34.6%) displayed nervous behavior toward their spouses, and 2 (7.7%) later divorced. With respect to family life in the posttransplantation period, the lives of the other family members were reported to be affected negatively in 8 (30.7%). Two donors (7.7%) reported that their spouses were less interested in their family and failed to carry out domestic responsibilities after the donation (Figure 4).

Abnormal family functioning was not found to be correlated with problems in recipients or medical and psychological problems in donors (Table 2).

Table 2. Investigation of correlation between abnormal family functioning and possible causative factors

n=26	Abnormal family functioning (p)	Pearson correlation (r)
Presence of medical problems of recipients	NS	0.012
Presence of medical problems of donors	NS	0.154
Psychological disruption in donors	NS	0.219

DISCUSSION

Liver donor participation must be free of coercion; however, it is difficult to avoid indirect coercions like social pressure, economic pressure, deteriorating health of the recipient, and cultural and psychopathological factors (8). Family members may have a certain moral obligation to serve as an organ donor (9,10). Additionally, liver resection exposes healthy donors to the risk of morbidity and mortality. Thus, it is to be expected that the donors and families may have significant stress in the evaluation phase. This stress may lead to anxiety reactions in some of the donors. Initial empirical results have shown that most potential donors indicate a pronounced motivation to donate, whereas 15% of potential donors express anxiety and feelings of ambivalence (11). In our study, donors were highly motivated to donate, and all the donors said they would donate again if required. This is actually self-evident. The role as a parent or someone close to the child recipient makes it impossible to refuse. The parent-child relationship is inherently coercive. Nevertheless, nearly 15% had anxiety regarding posttransplant quality of life and posttransplant complications. They underwent a detailed psychological evaluation and none of them required any medical or psychotherapeutic approach. However, donors whose capacity to cope with anxiety is insufficient, whose motivation to donate is not particularly marked, and who do not have adequate psychologic support might have adverse psychological outcomes in the posttransplant period and should be closely followed.

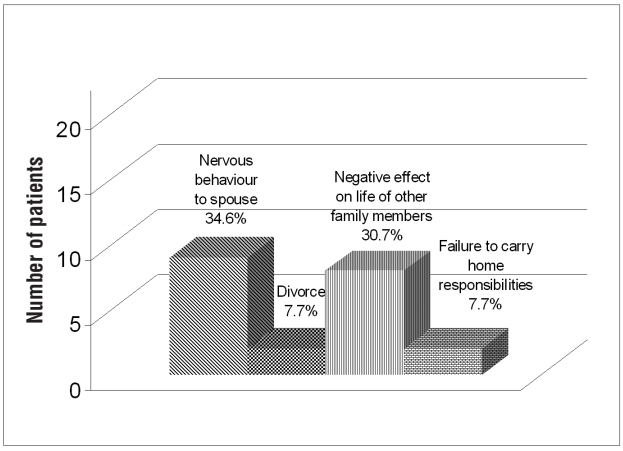

Figure 4. Family functioning after living-related liver transplantation.

In the study by Walter et al. (12), donors' complaints particularly on the scales 'tiredness' and 'fatigue' increased after LRLT. However, this increase did not deviate from that of the average population. Donors displayed a decrease in anxious depression and increase in elevated mood scales compared to the preoperative period. However, negative psychosocial outcomes such as clinical depression and somatization have been reported after LRLT in a number of studies (13,14). In the study by Erim et al. (15), 6 (14%) living donors - all female - had transient, but severe psychiatric disturbance as depressive disorders in 5 and posttraumatic stress disorder in 1. They suggested that female donors and donors with a more complicated postoperative course more often develop psychiatric symptoms and should receive adequate care (15). Our study seems to support the latter studies displaying negative psychosocial outcomes after LRLT. Nearly one quarter of donors (n=8) reported psychosocial disturbance, and 2 of them (6.3%) developed depression severe enough to necessitate medical and psychotherapeutic intervention. In a group of adult living liver donors, Kim-Schluger et al. (16) established a positive correlation between recipient outcome and donor emotional health sca-

le scores. Donors whose recipients do well clinically are themselves more likely to do well psychologically (17,18). Psychological disruption was also positively correlated with the recipients' problems in our study. We were unable to show any association of psychological disruption with pretransplant anxiety or presence of medical problems in donors.

Family dynamics were expected to be affected after transplantation. However, the subject was not extensively studied in the setting of LRLT. In a study of living-related kidney transplantation, Reimer et al. (19) observed that the donation led to family conflict in 5 cases (10.6%) and divorce in 3 cases (6.4%). A United Kingdom study (20) of renal transplantation again examined the psychologic and social–cultural perspectives of live donation and determined that donation may lead to anxiety regarding marriage and marital failure, and affect the other members of the family. Rodrigue et al. (21) examined the parenting stress, coping strategies and family functioning among 27 mothers of children undergoing bone marrow, liver, kidney, and heart transplantation at the pretransplant stage and at 1- and 6-month posttransplant stages. Increased parenting stress, financial strain, caregiver burden, and family stress were reported following transplantation and persisted for several months. In a descriptive, longitudinal study of 15 mothers whose children had undergone transplantation at least 5 years before, family stress had been determined to persist (22). Yoshino et al. (23) observed that LRLT has significant influence particularly on the families with siblings by causing significant stress on families and stress and mental problems in siblings. Alonso et al. (24) studied family functioning among pediatric liver transplant recipients. Although family function was significantly associated with demographic factors and biliary problems, transplant families overall did not appear to have a higher level of family dysfunction (24). In our study, we observed family dysfunction at a considerably high rate (34.6%). Two families (7.7%) divorced; however, the partners had many marital problems even prior to transplantation. In nearly 30% of families, lives of other family members were negatively affected in some way. Abnormal family functioning was not found to be correlated with problems in recipients, or medical or psychological problems in donors.

There are some limitations to this study. Our study was based on retrospective data. Retrospective analysis may be inappropriate to document medical problems. Longitudinal and prospective studies might be more useful in evaluating psychosocial outcome and family functioning. Similar to the majority of studies examining pediatric transplant, the sample size was small and therefore limited analytic procedures.

Nevertheless, our study shows that psychological disturbance in liver donors that is mainly associated with the recipients' problems is frequently observed during the posttransplant period, and may necessitate hospitalization and medical intervention. Thus, donors and families should be informed not only regarding somatic complications, but also for probable psychological complications. Psychologic assessment should be regularly repeated during the posttransplant period, and donors who are at risk of psychologic disruption should be closely followed. Living-related transplantation may cause marital failure and abnormal functioning in a considerably high percentage of families. Assessment of family functioning at regular intervals together with family psychotherapy when needed may decrease the incidence of abnormal family functioning.

Acknowledgement: *Preliminary results of this study were presented at the "Young Investigator Forum" organized by the European Society of Pediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN), April 19-22, 2007, in Germany.*

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