Short Communication

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The Study of Abnormal Liver Ultrasound Findings in Candidate Patients Undergoing Renal Transplantation from Brain Dead Donors

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ABSTRACT

BACKGROUND AND OBJECTIVE: Chronic kidney disease in addition to kidney involvement may cause abnormalities in various systems of the body, in which liver disorders are one of the most commonly encountered disorders. Failure to identify some of these disorders can cause a serious problem in transolant patient. This study was performed to determine the frequency and type of abnormal liver ultrasound findings in renal transplant patients.

METHODS: In this cross-sectional study, recorded data of 480 kidney failure patients who had received kidney transplant from brain death donors during the last 6 years in three Mashhad hospitals were investigated. Ultrasonography was considered before the transplant and abnormal liver findings were recorded in a checklist and were assesed.

FINDINGS: The mean age was 39.07±12.67 years of which 52.70% were male and 42.30% were female. Liver disorders were observed in 13.12% of patients. The highest prevalence was related to fatty liver grade I (2.5%), grade II (1.46%), gallstone (1.25%) and liver cysts (1.25%).

CONCLUSION: The results of the study showed that liver asymptomatic disorders in renal transplant patients have significant prevalence and because some of these disorders require treatment before transplantation, enough attention to screening before transplantation can help to prevent post-transplant complications.

KEY WORDS: *Brain death, Renal insufficiency, Transplant, Ultrasonography, Liver*.

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Introduction

Kidney transplantation is a selective treatment for patients at the final stage of kidney failure. The use of donated kidneys from people with brain death is best suited to respond to the increasing need for kidney transplantation (1).

Patients with renal transplant candidates undergo various studies prior to transplantation; one of the organs examined is the liver. Chronic liver disease is the fourth leading cause of death in patients undergoing kidney transplantation. Timely and rapid diagnosis of hepatic lesions can prevent progressive liver lesions and have an adverse effect on all transplantation (2).

Metabolic syndrome is one of the risk factors for developing advanced stages of acute renal failure, which can lead to non-alcoholic fatty liver (3,4). Clinical manifestations vary from asymptomatic status to the development of hepatitis, cirrhosis, etc. (5). On the other hand, some liver disorders, including biliary stones, biliary polyps, parasitic cysts and ... may be completely asymptomatic, but require treatment before the transplant.

Considering the fact that there are no definite data on hepatic impairment in patients with renal transplant failure in our country, this study was conducted to determine the frequency and prevalence of abnormal liver ultrasonography prior to transplantation in renal transplant patients with brain death.

Methods

This cross-sectional study was conducted on all patients who underwent kidney transplants from brain deaths during the years 2008-2014 in Montasirieh, Ghaem and Imam Reza hospitals of Mashhad were performed. after approval by the Ethics Committee of the Mashhad University of Medical Sciences with registration code of IR.MUMS.REC.1396.183 Patients with defective or non-performing liver ultrasound were excluded from the study. Demographic data of patients such as age, sex, etc. were reviewed and recorded in the checklist. Complete ultrasonography of the abdomen and pelvis was performed by eleven trusted radiologists and all of the abnormal findings reported in the checklist were recorded. A total of 497 patients were enrolled in the study, of which 17 were excluded from the study due to defects.

Fatty liver grading as Grade 1 (mild): Mild and diffuse increased echo of the parenchyma of the liver, Grade 2 (moderate): Moderate and diffuse increased echo of parenchyma in the liver and a slight difference in the observation of intra-liver vessels and diaphragm and Grade 3 (severe): Severe increased echo of the parenchyma and poorly observed or unable to view the vessels in the liver was considered (6). Data were analyzed by SPSS software version 22 and also distribution tables and frequency were analyzed.

Results

Of the 480 cases studied, 63 cases (13.12%) had abnormal findings in sonography prior to transplantation. The mean age of the patients with abnormal findings was 39.07±12.66 years in the ultrasound. 36 cases (52.7%) were male and 27 (42.3%) were female. Disorders such as fatty liver, hemangioma, gallstones, liver cysts, ecogenic focus, liver calcification, liver fibrosis, hepatomegaly, gall bladder polyps, and liver mass with different percentages were observed in patients (Table 1).

The highest prevalence was Grade I and Grade II of fatty liver, Gallbladder stone and liver cysts and the lowest prevalence was Grade III fatty liver, liver mass, liver mass, liver fibrosis and gallbladder polyps.

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Table 1. Frequency of liver disorders in renal transplant patients from brain death donors

Disorders	Total	Men N(%)	Men's Age Mean±SD	Women N(%)	Women's Age Mean±SD	Prevalence (%) (relative to the total patients)
Fatty liver(Grade I)	25	12(48)	45.42±10.488	13(52)	44.85±0.466	2.5
Fatty liver(Grade II)	7	4(57)	24.75±11.176	3(43)	33.36±14.047	1.46
Fatty liver(Grade III)	1	1(100)	45	0	0	0.21
Hemangioma	4	1(50)	44.35±11.313	2(50)	46±2.828	0.83
Galblader stone	6	3(50)	37.31±12.124	3(50)	38.66±6.506	1.25
Liver cyst	6	3(50)	45.44±14.422	3(50)	45.3±3.511	1.25
Echogenic foci	3	2(66.7)	39.7±14.828	3(33.3)	24	0.62
Liver Calcification Center	2	2(100)	43.5±7.778	0	0	0.42
Liver fibrosis	2	1(50)	21	1(50)	0	0.42
Hepatomegaly	5	4(80)	12.66±6.164	1(20)	29	1.4
Gallbladder Polyps	1	1(100)	53	0	0	0.21
Liver mass (nodular hyperplasia)	1	0	0	1(100)	49	0.21

Discussion

In this study, non-alcoholic fatty liver was the most frequent in patients. The prevalence of this disease in the general population of developed countries 25-30%, in Asia 12-24%, and in the general population of Iran, 2.9-7.1% (7,8). The results of a study conducted by Younesian et al which was performed on 44 students with a BMI> 30, indicated that they were all non-alcoholic fatty liver patients (9). The results of this study indicate that the prevalence of fatty liver in patients with renal insufficiency is more than the general population and the frequency of fatty liver grade I is higher than other grades. In this study, 25.1% of patients with galblader stone were asymptomatic, all of them had undergone cholecystectomy before transplantation. Galblader stone are the most common cause of biliary disease in the United States (10).

The prevalence of gallblader stones in different populations is reported to be between 4-13.6% (11,12). Immunosuppressive drugs can delay the diagnosis of biliary stones and its complications. The results of the study by Jackson et al. indicated that the incidence of complications of biliary stones after kidney transplantation did not increase (7). While the results of the study by Sarkio et al. suggested that the complications of gallstones in transplant patients may be very severe; therefore, the diagnosis and treatment of these patients before and after transplantation is recommended (13). In the present study, only 4 cases (0.83%) of hemangioma were observed in pre-transplantation ultrasonography, which seems to have a similar prevalence to the general population. Hemangioma is often asymptomatic and is accidentally detected during sonographic assessments. Liver cysts are one of the common disorders in the liver, which are usually detected by chance (14). In patients undergoing kidney transplantation, these cysts may be associated with manifestations such as abdominal pains, nausea, and fever (15,16).

In Middle Eastern countries, parasitic cysts such as hydatid cysts are the main cause of hepatic cysts. Rejection of infectious and parasitic causes before transplantation is mandatory in these patients and in case of these cysts, appropriate treatment before transplantation is necessary. Gallbladder polyps are prevalent 1.5-12% in the general population. The sensitivity of ultrasound is evaluated for the diagnosis of biliary polyps 32-90% (11).

Regarding the presence of malignancy, especially in larger polyps, polyp detection and cholecystectomy can lead to the prevention of gallstone cancer in these patients, if necessary. In this study, gallbladder polyp was observed in one patient, which is not different

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from the prevalence in the general population. The results of this study indicate that Grade I and II fatty liver are the most common internal diseases and gallstones and liver cysts are the most common surgical liver disease in patients with liver failure condidated for renal transplant, which their timely diagnosis before transplantation can be effective in selecting the candidate for transplant patients and prevent the complications of these disorders after the kidney transplant.

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