

Prevalence of Non-Alcoholic Fatty Liver Disease in Kidney Donors at Pakistan Kidney and Liver Institute and Research Center (PKLI&RC) Lahore

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ABSTRACT

As the incidence of having a fatty liver on ultrasound is increasing in the east due to the unhealthy dietary habits resulting due to the influence of west, it is important to diagnose people who are willing to become kidney donors. The future risk of diabetes and developing the metabolic syndrome is not uncommon in this population who will be already devoid of one kidney. The increase in morbidity and mortality in such population due to cardiovascular causes can't be ignored. This retrospective observational study having a sample size of 200 was conducted at a specialized center in Pakistan. Patients having NAFLD due to any other causes such as hepatitis, alcoholism or any drug were excluded. Data was collected after the approval of the research and ethical board. All the data was entered into SPSS version 22 and analyzed. P value of <0.05 was taken as significant. Results revealed 55% male population and participants had an average age of 36.8±10.1 years, BMI 26.4±4.3 kg/m², HbA1c 5.33±0.34, uric acid 5.1±1.4 mg/dl, triglyceride 138±80 mg/dl. The prevalence of NAFLD was 30%. A significant association was found out between presence of NAFLD and age, BMI and triglyceride levels with a p-values 0.011, 0.001 and 0.002 respectively. This data was compared with similar studies and comparable results were observed.

Keywords: kidney donors, NAFLD, diabetes

INTRODUCTION

Nonalcoholic fatty liver disease (NAFLD) is defined by presence of liver steatosis as evidenced by ultrasonography or histology while other causes including alcohol intake are excluded by history [1].

NAFLD is usually associated with metabolic syndrome as its hepatic component [2]. Obesity is current global epidemic and as a result incidence and prevalence of NAFLD is also increasing in all age groups. It is most common cause of chronic liver disease (CLD) in western population owing to their sedentary lifestyle and high energy food intake [3].

NAFLD is associated with increased morbidity and mortality due to its hepatic as well as other cardio-metabolic consequences. In fact, cardiovascular disease is most common cause of death in these patients [4]. Hence, its diagnosis prevention and treatment are of paramount importance to any health delivery system.

Incidence of NAFLD in kidney donors is not known in our population [5], so this study aimed to know this incidence in this selected population group to help ascertain its magnitude and devise a comprehensive health plan.

MATERIALS AND METHODS

A retrospective observational study was carried out over a period of one month between March-April 2022, using non-probability consecutive sampling technique, at a specialized transplant center, in order to determine the prevalence of non-alcoholic fatty liver disease in kidney donors. NAFLD was diagnosed by non-invasive method of ultrasonography by raised liver echogenicity as invasive diagnostic methods would be un-ethical in otherwise healthy kidney donor.

All kidney donors coming at PKLI&RC, having fatty liver on ultrasound abdomen were included in the study. However, patients having hepatitis B, hepatitis C or HIV were excluded along with participants who had history of alcohol or any drug intake which may cause fatty liver.

Data Collection: Data was collected through retrospective analysis of all the record available at kidney transplant OPD of all potential kidney donors and was noted down by the researchers. Patients fulfilling the inclusion criteria were included in the study. Data was collected after institutional research and ethical review board approval.

Data Analysis: All data was analyzed using SPSS version 22.0. Quantitative variables such as age and body mass index (BMI), triglyceride levels (TG), uric acid and glycosylated hemoglobin (HbA1c) were calculated as mean and standard deviation. Qualitative variable such as gender, family history of diabetes and presence of fatty live on ultrasound are presented as frequency and percentages. Data was stratified for age, gender and BMI. Prevalence was calculated using standard calculators. association of presence of NAFLD with different sociodemographic characteristics was found out using chi square test. p value of <0.05 was taken as significant.

RESULTS

Table 1: Sociodemographic characteristics risk factors of study participants (n=200)

Characteristics	
Age (years)	36.8±10.1
Gender	
Male	111(55.5)
Female	89(44.5)
BMI (kg/m ²)	26.4±4.3
Family history of diabetes	
Positive	59(29.5)
Negative	141(70.5)
HbA1c (%)	5.33±0.34
Uric Acid (mg/dL)	5.1±1.4
Triglyceride levels (mg/dL)	138±80
Fatty liver on Ultrasound	
Present	60(30)
Absent	140(70)

Table 1 shows the distribution of study participants according to various demographic as well as other risk factors that may be associated with presence of fatty liver in kidney donors. Male population was 111(55%) of the total sample size. Average BMI was calculated out to be 26.4±4.3 which was slightly more than the healthy range and mean age was 36.8±10.1. 29.5% of donors had a positive family history of diabetes. Average Uric Acid, HbA1C and triglyceride levels are in normal range. The prevalence of fatty liver is 30% among the 200 kidney donors.

Table 2 shows the association of presence of fatty liver with various factors mentioned in table 1. Here the patients were

divided according to normal or higher range of BMI, HbA1C, Uric Acid and Triglyceride levels. It is evident that presence on fatty liver depended on the BMI, age and triglyceride levels, i.e. higher the number more the chances of having a fatty liver. The p-value were 0.011, 0.001 and 0.002 respectively.

Table 2: Association of presence of fatty liver with different risk factors.

Risk factors	Fatty Liver		p- value
	Present	Absent	
BMI (kg/m ²)			
≤25	14(23)	59(42)	0.011
>25	46(77)	81(58)	
Age (years)			
≤35	19(48)	81(58)	0.001
>35	41(52)	59(42)	
Gender			
Male	34(57)	77(55)	0.828
Female	26(43)	63(45)	
Family History of Diabetes			
Yes	20(33)	39(28)	0.436
No	40(66)	101(72)	
HbA1C (%)			
≤5.5	43(72)	107(76)	0.476
>5.5	17(28)	33(24)	
Triglyceride levels (mg/dL)			
≤150	32(53)	106(76)	0.002
>150	28(47)	34(24)	
Uric Acid Levels (mg/dL)			
≤7	56(93)	128(91)	0.649
>7	4(7)	12(9)	

However, when the same associated was observed with gender, family history of diabetes, HbA1C and uric acid levels, the results were found out to be non-significant as seen in the table, with p values of 0.828, 0.436, 0.476 and 0.649 respectively.

DISCUSSION

As evident in the results, the prevalence of fatty liver in kidneys donors is 30% which is much higher when compared to a similar study conducted by Mekeel et al, which quoted percentage of 10-13% [5]. Another research by Yoon et al. included 8.45% of kidney donor who had metabolic syndrome [6]. These donors had an average age of 48.4±9.2 years, whereas 53% of donor is our study were >35yrs of age. This shows that the incidence is higher in older age groups.

Another study conducted in China, comparing populations of the east and west, i.e. USA and China revealed that NAFLD was more prevalent in the western population, 36.08% in USA and 27.12% in China. Furthermore, these participants were found out to have a raised BMI, blood glucose, blood pressure, cholesterol and triglyceride levels [7]. These findings were also observed in our study which showed a significant associated of presence of fatty liver with raised triglyceride levels and BMI (. (p=0.002 and 0.011).

It has also been found out in a few studies that NAFLD is itself a strong risk factor for the development of chronic kidney disease in patients, but data varies in some research, so it is difficult to establish it as a proven fact [8,9,10,11]. This was not done in this study as establishing CKD requires a persistently deranged renal function for 3 months, keeping in view of the cost and regular follow ups from donors who were mostly residing out of city. The incidental finding of NAFLD has not stopped clinicians to recruit potential donors from such population as there is further

testing done on these patients to find out any evidence of liver fibrosis or deranged liver function [6].

Limitations: This study enrolled 200 participants from a single transplant center. In order to get a better estimate of prevalence, multi-centric research should be conducted with a bigger sample size involving participants from all over the country. Furthermore, the criteria by which NALFD was diagnosed in the patients included only sonographic evidence and not the liver function tests.

CONCLUSION

The prevalence of NAFLD in kidney donor population was 30% and there was a significant association found with older age, raised BMI and triglycerides (p= 0.001,0.011 and 0.002 respectively).

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