



CODEN [USA]: IAJ PBB

ISSN: 2349-7750

## INDO AMERICAN JOURNAL OF PHARMACEUTICAL SCIENCES

<http://doi.org/10.5281/zenodo.3401782>

Available online at: <http://www.iajps.com>

Research Article

### A RESEARCH STUDY TO ASSESS THE GRAFT OUTCOMES AMONG PATIENTS EXPERIENCING TRANSPLANTATION OF KIDNEY

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**Article Received:** July 2019

**Accepted:** August 2019

**Published:** September 2019

**Abstract:**

**Background:** The effect of cirrhosis on post-transplantation kidney graft survival is not well established. Previous studies demonstrate a reduced rate of survival (31%) in comparison with the overall rate of survival in five years (31%) among cirrhotic patients who underwent transplantation of kidney. Data is scarcely available on the topic of graft survival among patients experiencing kidney transplantation alone with concomitant cirrhosis.

**Objective:** The objective of this research was to analyze the experience about the cirrhotic patients presenting End-Stage Renal Disease experiencing KTA along with the determination of graft survival.

**Patients & Methods:** We carried out this research at Mayo Hospital, Lahore from April 2018 to February 2019 on a total of 131 patients who received transplantation of kidney. These patients also presented HBV, HCV or cryptogenic cirrhosis; whereas, 12 patients presented concomitant cirrhosis in the course of transplantation. We also compared the three years of survival rate with the national average rate. Patients were included in the research after informed consent. We also secured ethical review board permission before the commencement of research. Patients were also briefed about the research protocols. KTA patients were divided into cirrhotic and non-cirrhotic groups. The cirrhotic group included aged-matched patients who presented CLD history with cirrhosis evidence through biopsy. The non-cirrhotic group also consisted of age-matched groups who presented chronic liver disease without any evidence of cirrhosis or fibrosis through radiographic or histopathological approach among those who experienced KTA in the same timeframe. We also assessed the demographics, parameters of kidney disease and parameters of hepatic disease of the patients. Patient survival, 3-years rate of graft survival and 5-years rate of graft survival were posted KTA associated outcomes.

**Results:** Among twelve patients there were 2 patients who presented cirrhosis etiologies HBV, 7 patients of HCV and 3 patients with cryptogenic. These patients were histologically confirmed before transplantation of the kidney at six months or within six months. Mean graft survival was reported as 8.1 years, graft survival at three years was 75% and at five years was 58%.

**Conclusion:** Initial information proposes that the patients of cirrhosis may be considered for kidney transplantation and liver transplantation. The graft survival rate at three years was much below the average value of the national survey (82%). This research also exhibits the advantages of liver biopsy in the presence or absence of measurement of portal pressure before the act of transplantation with hepatic diseases and hepatitis to an accurate stage of fibrosis.

**Keywords:** Transplantation, Liver, Kidney, HCV, HBV, Kidney Graft and Cirrhosis.

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Please cite this article in press Ahmad Talal Asif et al., *A Research Study to Assess the Graft Outcomes among Patients Experiencing Transplantation of Kidney.*, *Indo Am. J. P. Sci.*, 2019; 06(09).

**INTRODUCTION:**

CKD occurrence particularly related to the onset of ESRD is at a rise with an alarming figure. Estimates conform that one out of ten adults and more than twenty million present CKD with a certain level [1]. ESRD occurrence is reported in approximate 350/million with 400,000 cases experiencing hemodialysis (HD) as a primary mode of disease management [2]. Transplantation of kidney is a suitable and effective ESRD solution with the three-years rate of national grafting among liver donors and combined diseased patients (82%) [3]. No established literature is available about the kidney grafting impact and advanced liver disease impact.

CLD prevalence is chronic in nature and the general population has been increased in the last decade which is estimated to incline to 15% in the population of the USA [4]. Most dominant etiological factors include HCV, NAFLD and alcoholic liver disease; it is a disease which is increasing in both ways in terms of prevalence and occurrence [4]. Among ESRD and CLD patients, cirrhosis was estimated at about 22% [5]. Long-term survival of graft and liver disease decompensation are related concerns of transplantation of kidney.

Cirrhosis independently predicts mortality among the patients of renal transplant and present kidney disease recommendations: the improvement of the worldwide outcome's; cirrhosis secondary to hepatitis C virus which is a contradiction to KTA [6]. Combined transplantation of kidney-liver may have posed better outcomes; however, its use is controversial as well due to associated implications and depletion of the available quantity of livers. The objective of this research was to analyze the experience about the cirrhotic patients presenting End-Stage Renal Disease experiencing KTA along with the determination of graft survival.

**MATERIALS AND METHODS:**

We carried out this research at Mayo Hospital, Lahore from April 2018 to February 2019 on a total of 131

patients who received transplantation of kidney. These patients also presented HBV, HCV or cryptogenic cirrhosis; whereas, 12 patients presented concomitant cirrhosis in the course of transplantation. We also compared the three years of survival rate with the national average rate. Patients were included in the research after informed consent. We also secured ethical review board permission before the commencement of research. Patients were also briefed about the research protocols. KTA patients were divided into cirrhotic and non-cirrhotic groups. The cirrhotic group included aged-matched patients who presented CLD history with cirrhosis evidence through biopsy. The non-cirrhotic group also consisted of age-matched groups who presented chronic liver disease without any evidence of cirrhosis or fibrosis through radiographic or histopathological approach among those who experienced KTA in the same timeframe. We also assessed the demographics, parameters of kidney disease and parameters of hepatic disease of the patients. Patient survival, 3-years rate of graft survival and 5-years rate of graft survival were posted KTA associated outcomes.

We analyzed continuous variables through sample T-test. Analysis of Kaplan-Meier was used for graft survival and patients. The calculation of graft survival was made from transplantation time to resumption of hemodialysis, last follow-up or death. Statistical analysis was made on SPSS software.

**RESULTS:**

Among twelve patients there were 2 patients who presented cirrhosis etiologies HBV, 7 patients of HCV and 3 patients with cryptogenic. These patients were histologically confirmed before transplantation of the kidney at six months or within six months. Mean graft survival was reported as 8.1 years, graft survival at three years was 75% and at five years was 58%. The study reviewed charts of 131 patients and shortlisted only twelve patients who presented cirrhosis during transplantation of kidney. These patients experienced KTA. Mean age of the cirrhotic group patients was (60.3 ± 1.79) years and mean age for the non-cirrhotic

group patients was ( $57.4 \pm 1.97$ ) years. Detailed outcomes about patient's demographics during KTA are presented in Table – I. Detailed laboratory parameters of the patients during KTA are presented in Table – II. Table – I presents the comparison of cirrhotic versus non-cirrhotic group in terms of ethnicity, cause of liver disease, cause of ESRD and Child-Pugh. Table – II presents the comparison

between cirrhotic versus non-cirrhotic group in terms of laboratory parameters including WBC ( $\times 10^3$ ), Hemoglobin (g/dL), Hematocrit (%), Platelets ( $\times 10^3$ ), Sodium (mEq/L), BUN (mg/dL), Creatinine (mg/dL), Albumin (g/dL), Protein (g/dL), Alkaline Phosphatase (U/L), Total Bilirubin (mg/dL), AST (U/L), ALT (U/L), PT (sec) and INR.

**Table – I:** Patient's Demographics during KTA

Demographics		Cirrhotic Group (12)		Non-Cirrhotic Group (10)	
		Number	Percentage	Number	Percentage
Ethnicity	Hispanic	7	58	4	40
	Caucasian	3	25	3	30
	African-American	2	17	3	30
Cause of Liver Disease	Hepatitis C	7	58	5	50
	Hepatitis B	2	17	0	0
	NAFLD/NASH	2	17	0	0
	Other	1	8	0	0
	No Disease	0	0	5	50
Cause of ESRD	Hypertension	0	0	4	40
	Diabetes	2	17	3	30
	PCKD	1	8	1	10
	IgA nephropathy	1	8	0	0
	Unknown	8	67	2	20
	Ascites Present	3	25	0	0
	Hepatic Encephalopathy	1	8	0	0
Child-Pugh	A	10	83	0	0
	B	2	17	0	0

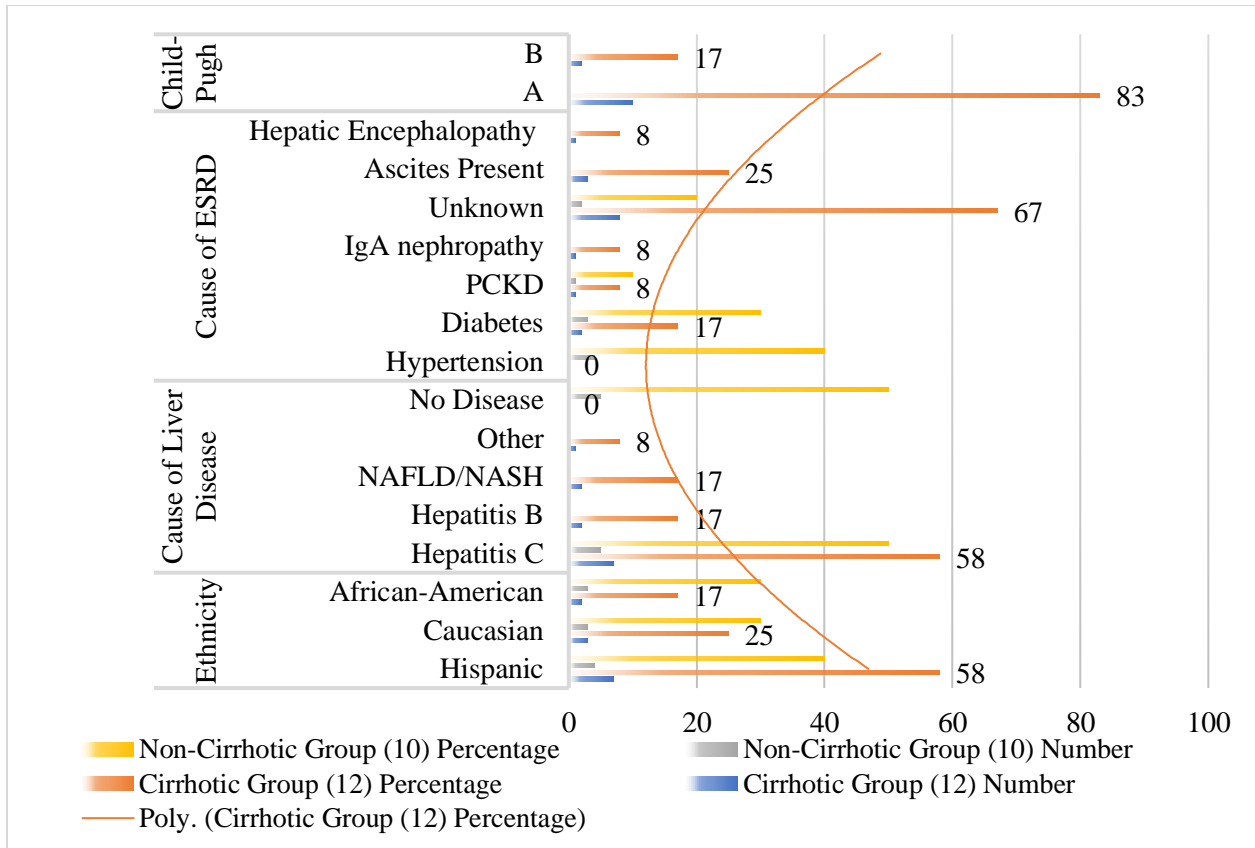
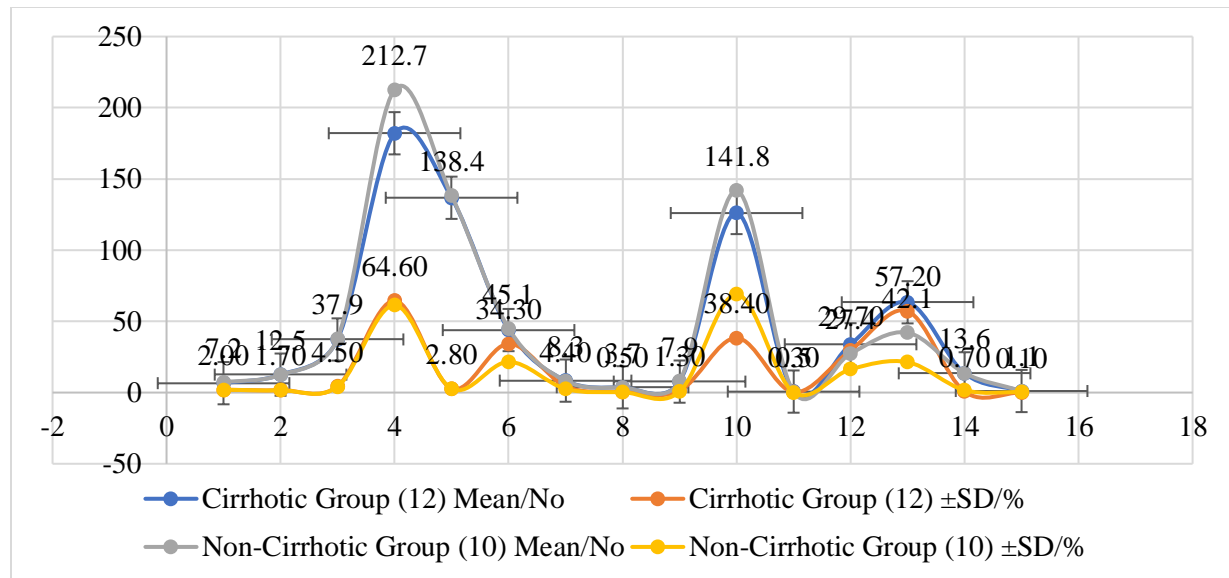


Table – II: Patient’s Laboratory Parameters during KTA

Laboratory Parameters	Cirrhotic Group (12)		Non-Cirrhotic Group (10)	
	Mean/No	±SD/%	Mean/No	±SD/%
WBC (× 10 <sup>3</sup> )	6.6	2.00	7.2	2.00
Hemoglobin (g/dL)	12.6	1.70	12.5	1.60
Hematocrit (%)	37.3	4.50	37.9	4.20
Platelets (× 10 <sup>3</sup> )	182.1	64.60	212.7	61.40
Sodium (mEq/L)	136.8	2.80	138.4	2.70
BUN (mg/dL)	43.9	34.30	45.1	21.60
Creatinine (mg/dL)	8.4	4.40	8.3	2.60
Albumin (g/dL)	3.7	0.50	3.7	0.30
Protein (g/dL)	7.7	1.30	7.9	0.70
Alkaline Phosphatase (U/L)	126.1	38.40	141.8	69.00
Total Bilirubin (mg/dL)	0.7	0.30	0.5	0.10
AST (U/L)	33.9	29.70	27.4	16.40
ALT (U/L)	63.4	57.20	42.1	21.40
PT (sec)	13.5	0.70	13.6	1.70
INR	1.1	0.10	1.1	0.30



### DISCUSSION:

Cirrhotic patients having End-Stage Renal Disease pose a great challenge in the consideration for CLKT versus KTA. Liver disease is also important with organ allocation in terms of kidney graft survival. Suitable disease management has always been controversial among patients. Previous studies do not suggest KTA for cirrhotic patients without accounting the condition of the patients rather compensated or decompensated [7, 8]. Newer global recommendations suggest KTA for compensated cirrhosis; whereas, CLKT is suggested for decompensated cirrhosis [9 – 10]. We demonstrated graft survival and patient survival with improvement among non-cirrhotic patients than cirrhotic patients. With comparison to the previous efforts, out five years cirrhotic patient's survival was 58% associated with past survival rates of the lower graft [11]. Non-cirrhotic age-matched patients demonstrated significantly beneficial aspects in terms of survival rate.

The primary issues associated with KTA are graft survival and patient survival which were reported among cirrhotic patients. According to Mouquet, graft survival and patient survival among cirrhotic patients was significantly less than non-cirrhotic patients at five years (31% versus 92%) [11]. Our research was limited to cirrhotic patients which developed after experiencing KTA. Recent research presented an improved trend in the rate of survival for three-years (79%) and graft survival for three-years (86%) [12]. This research also demonstrates the significant benefit of patient survival and survival of longer graft among non-cirrhotic kidney transplantation alone patients. HBV and HCV patients need to be considered for the biopsy of the liver before KTA in order to evaluate

fibrosis which poses vital implications in the postoperative treatment. Various authors suggest liver biopsy for the purpose of staging in order to consider patients for CLKT versus KTA [7, 13].

The assessment of the portal hypertension extent has slowly become a repeated practice to classify cirrhotic patients for KTA. Clinical assessment is difficult among ESRD due to complications including ascites. Trans Jugular approach is more accurate for the measurement of portal pressure with HVP (Hepatic Portal Venous Gradient above 10 mmHg) that also indicates decompensation [13]. This research also had several limitations as it was retrospective research with inherited deficiencies. The size of the population was also limited in number. There is no such routine to perform portal pressure measurements through Trans Jugular method. We have addressed a difficult issue in this research which is gradually progressing among populations. KTA may be replaced with CLKT because of the reduced rate of graft survival and patient survival.

### CONCLUSION:

Initial information proposes that the patients of cirrhosis may be considered for kidney transplantation and liver transplantation. The graft survival rate at three years was much below the average value of the national survey (82%). This research also exhibits the advantages of liver biopsy in the presence or absence of measurement of portal pressure before the act of transplantation with hepatic diseases and hepatitis to an accurate stage of fibrosis.

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