KIDNEY TRANSPLANT PATIENTS TREATED FOR HCV: REAL WORLD EVIDENCE (RWE) FROM A LARGE EMR DATABASE

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BACKGROUND & OBJECTIVES

Kidney transplants continue to be the best treatment option for patients with stage 5 chronic kidney disease or end stage renal disease (S5CKD/ESRD).[1] In 2016, 20,161 kidney transplants were performed in the US,[2] and while hepatitis C virus (HCV) treatment has improved in recent years, there continues to be over 2 million prevalent cases of HCV in the US.[3] The following analysis examined whether patients treated with a direct acting antiviral (DAA) and an immunosuppressant (IS) differed from patients treated with an IS alone regarding complications and overall survival (OS).

METHODS

Patients were identified using the TNX Platform, a network of EMR data from healthcare organizations representing over 50 million patients in the US. Patients were required to be on dialysis or have a diagnosis of S5CKD/ESRD prior to their first kidney transplant. These patients were stratified by their HCV status. Patients with HCV were further stratified by treatment: DAA+IS vs IS alone. Outcomes included kidney transplant complications, glomerular diseases, proteinuria, and mean eGFR in the year following the kidney transplant and 5-year OS. Definitions were based on ICD9/10, CPT, LOINC, and RxNorm codes.

Characteristics in Table 1 were included in a propensity score model that matched patients 1:1 using a greedy nearest neighbor algorithm with a caliper of 0.25 times the standard deviation (SD). Among matched patients, relative risk (RR) and 95% confidence intervals (CIs) and Kaplan-Meier curves were calculated for each outcome.

	Before matching		After matching*	
	DAA+IS	IS only	DAA+IS	IS only
N	560	1,529	536	536
Mean age (SD)	59 (8)	57 (10)	59 (8)	58 (9)
Female (%)	23	32	24	24
White (%)	42	48	43	44
Black or African American (%)	49	34	47	48
Hispanic or Latino (%)	9	11	9	8
Hypertensive diseases (%)	98	96	98	98
Cystic kidney disease (%)	17	11	16	16
Diabetes mellitus (%)	71	63	70	68
Glomerular diseases (%)	44	36	42	41
Other forms of heart disease (%)	77	67	76	75
Hospital inpatient services (%)	69	52	68	68
Critical care services (%)	23	20	23	22

*For each characteristic the standardized mean difference between cohorts was less than 10%

Table 1. Cohort characteristics before and after matching treated HCV patients

1. Gordon CE, Balk EM, Francis JM. Summary of the 2018 Kidney Disease Improving Global Outcomes (KDIGO) Guideline on hepatitis C in chronic kidney disease. *Semin Dial.* 2019;32(2):187-195. 2. Saran R, Robinson B, Abbott KC, et al. US Renal Data System 2018 Annual Data Report: Epidemiology of Kidney Disease in the United States. Am J Kidney Dis. 2019;73(3S1):A7-A8. 3. Hofmeister MG, Rosenthal EM, Barker LK, et al. Estimating Prevalence of Hepatitis C Virus Infection in the United States, 2013-2016. Hepatology. 2019;69(3):1020-1031.

RESULTS

Kidney transplant patients with HCV did not differ significantly from patients without HCV.

Among treated HCV patients, DAA+IS treatment reduced the risk of complications and improved OS.

Kaplan-Meier curves showed patients treated with an IS alone experienced kidney complications at faster rate (Figures 1 & 2) and had a lower 5-year OS (72% vs 89%; Figure 3) than patients treated with a DAA+IS ($p<0.01$).

The mean eGFR among patients treated with a DAA+IS was 57.6 (28.6) compared to 45.2 (28.4) among patients treated with an IS alone ($t=6.9$, $p<0.01$).

Compared to patients treated with an IS alone, patients treated with a DAA+IS were:

- 0.75 (0.65-0.86) times as likely to have a kidney transplant complication
- 0.56 (0.42-0.74) times as likely to have glomerular disease
- 1.00 (0.77-1.27) times as likely to have proteinuria, and
- 0.31 (0.21-0.47) times as likely to die within a 5-year period

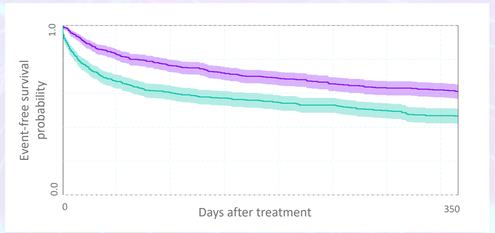

Figure 1. Kidney transplant complications

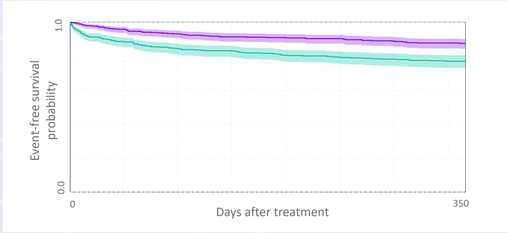

Figure 2. Glomerular disease

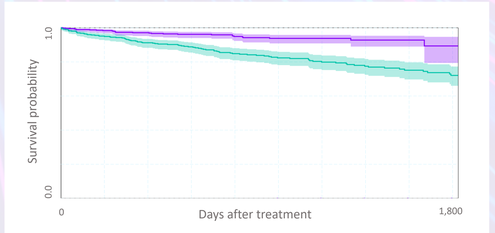

Figure 3. Five-year OS

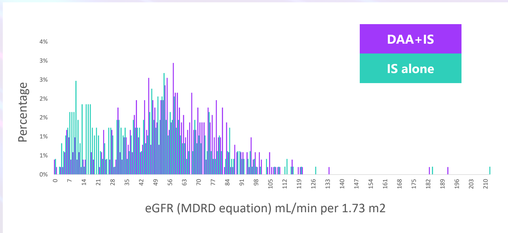

Figure 4. Distribution of eGFR values

CONCLUSION

Although kidney transplant patients with HCV did not differ significantly form patients without HCV regarding complications, glomerular disease, proteinuria, eGFR and OS, patients treated with a DAA+IS fared significantly better than those that did not receive DAAs. Clinical guidelines will need to continue to evolve and incorporate emerging RWE among patients treated for HCV following a kidney transplant.