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Simultaneous Liver-Kidney Transplant following Standardized Medical Eligibility criteria
and Creation of the Safety Net: Less appears to be more

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Abbreviations:

estimated Glomerular Filtration Rate	eGFR
Kidney after Liver Transplantation	KALT
Organ Procurement and Transplantation Network	OPTN
Simultaneous Liver-Kidney Transplantation	SLKT
United Network of Organ Sharing	UNOS

Renal dysfunction is common among liver transplant candidates and can present in various phenotypes. Approximately 10% of liver transplant candidates undergo simultaneous liver-kidney transplant (SLKT) though the majority of SLKT recipients that underwent transplant prior to August 2017 have been found to develop recurrent renal dysfunction. According to a recent multicenter observational study, after a median follow-up of 5 years after transplant, at least two-thirds of SLKT recipients developed

stage 3 chronic kidney disease and one-fifth had advanced chronic kidney disease.¹ These outcomes demonstrate the challenges in appropriate selection of SLKT candidates as well as complexities in preserving renal function post-transplant.

Prior to 2017, SLKT utilization was highly variable among transplant centers because of lack of consensus medical eligibility criteria.² This led to increased utilization of SLKT even among candidates for whom potential recovery of renal function after liver transplant alone was plausible.³ Due to the lack of specific policy addressing SLKT medical eligibility and inconsistencies in allocation such as regional sharing of deceased donor renal grafts to SLKT candidates, the Organ Procurement and Transplantation Network (OPTN) and the United Network for Organ Sharing (UNOS) organized a consensus committee to address the allocation of organs to individuals with end stage liver disease and renal dysfunction. This group developed a revised SLKT policy, which was based on data review, discussion, and deliberation, and was implemented on August 10, 2017.⁴ The current SLKT allocation policy includes standardized medical eligibility criteria. Additionally, given the difficulty to predict renal recovery among patients undergoing liver transplant alone, the policy created the option of a “safety net,” which promotes liver transplant alone by conferring priority for kidney-after-liver transplantation (KALT) in patients without renal recovery within 1 year of liver transplant.⁵ Data demonstrating the impact of this 2017 OPTN/UNOS policy change on SLKT utilization and outcomes are now emerging.

In this issue of Liver Transplantation, Samoylova and colleagues investigated the impact of this 2017 policy change on utilization of SLKT and KALT.⁶ Using data from UNOS Standard Transplant Analysis and Research files, the authors examined the outcomes of 6,332 adult SLKT recipients from 2007 to 2019. They divided the SLKT recipients into three temporal cohorts based on timing of transplant before and after the 2017 policy change (2007-2012, 2012-2017, 2017-2019). An additional cohort of 198 KALT recipients was evaluated separately to examine the utilization of KALT pre and post-policy change.

This authors' findings suggest that the 2017 policy change has succeeded in establishing more directed utilization of renal grafts for SLKT as intended. Although there was no significant change in overall rate of SLKT over time, a reduction in SLKT

utilization in patients with estimated glomerular filtration rate (eGFR) > 30 ml/min was seen. The median eGFR for those who were not on dialysis was significantly lower compared to pre-policy cohorts. Moreover, there was greater uniformity in medical eligibility criteria and decreased variability of eGFR at the time of SLKT following the 2017 policy change. The utilization of the safety net among liver transplant alone recipients with end stage renal disease led to KALT rates more than 2-folds higher than in the pre-policy cohorts.

Given the ever-growing utilization of LT for patients with non-alcoholic steatohepatitis and associated metabolic comorbidities contributing to renal dysfunction, there has been growing anticipation among the transplant community of the need for greater utilization for SLKT due to the nonalcoholic fatty liver disease epidemic. Samoylova and colleagues confirmed highest increased proportion of SLKT among patients with nonalcoholic steatohepatitis over time while the proportion of patients with a primary diagnosis of viral hepatitis decreased. Recent examination of granular data from the United States Simultaneous Liver-Kidney Transplantation Consortium showed similar trends in changing demographics and etiology of liver disease.⁷

There had been concern that the 2017 policy change could result in a post-transplant survival decrement, however Samoylova and colleagues showed similar survival after SLKT between the pre- and post-policy cohorts, refuting such concerns.⁸ The coupling of increased KALT utilization with non-inferior post-transplant survival demonstrated in this study further supports the efficacy of the safety net for patients with post-LT renal dysfunction.^{9,10}

While the findings of this study are reassuring, it is important to note that several questions remained unanswered. To begin with, the authors used conservative criteria to define renal dysfunction among actively listed or transplanted patients. While this method was performed in order to reflect patients that “may reasonably receive” SLKT or KALT and simulate the 2017 SLKT allocation policy criteria, it may have inadvertently captured some patients either not intended for SLKT or missed some patients deferred for KALT. Secondly, the data was extracted from UNOS database, which lacks granularity to determine nuances of renal dysfunction especially among the pre-policy revision cohort. Delays in UNOS data reporting may also have contributed to limited

data among the post-policy revision cohort, which was already limited by small size and short follow-up time. Lastly, this study did not address incidence of delayed renal graft function, immunosuppression usage pre- and post-policy change nor the phenotypes of KALT recipients that required the safety net.

All in all, the authors should be commended on their investigation on the early impact of the 2017 UNOS/OPTN policy change on SLKT utilization and outcomes especially given the limited data available in this area to date. Their findings suggest that SLKT allocation policy change has led to more streamlined utilization of renal grafts as well as an effective safety net. Ultimately regular evaluation of data is needed to better determine short- as well as long-term outcomes between SLKT and KALT recipients. Additionally, studies examining predictors of post-LT renal recovery and non-recovery are needed to help build clinical understanding and more informed indications for dual organ transplant among liver transplant candidates with renal dysfunction.

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