

Letter Regarding “Cardiac Outcomes in Isolated Heart and Simultaneous Kidney and Heart Transplants in the United States”



To the Editor: We read the article by Agarwal *et al.*,¹ in which they used the United Network for Organ Sharing database to reveal that cardiac outcomes in simultaneous kidney-heart transplants (SKHTs) recipients are better when compared with those in heart transplantation-alone recipients. The authors suggest that SKHT offered a significant long-term survival advantage and better cardiac graft outcomes for patients who were on pretransplant dialysis or had an estimated glomerular filtration rate <45 ml/min per 1.73 m². Nevertheless, we urge caution on interpreting these results, especially in patients with estimated glomerular filtration rate <45 ml/min per 1.73 m² (Figure 6/7 of the manuscript), because these comparisons were performed using univariable analysis in which various donor/recipient differences may not have been considered.

Because the smaller SKHT group was a highly selected population when compared with all heart transplantation-alone patients, we suggest that the authors reanalyze their data using propensity score matching to balance the differences between 2 groups and avoid any potentially misleading conclusions.

We analyzed the United Network for Organ Sharing data between 2015 and 2020 (time period when the SKHT increased in volume) using the inverse probability of treatment weighted method to adjust for various pretransplant patient characteristics to provide a potential answer. Our analysis revealed the opposite result: SHKT is a risk factor for cumulative survival during the study period (vs. heart transplantation-alone, adjusted hazard ratio 1.20, 95% CI 1.002–1.440, *P* = 0.047).

Although the frequency of SKHT has been increasing in the United States, consensus is still emerging regarding the best practices. We would like to suggest addressing this potential issue, as it would provide significant insights into their study.

DISCLOSURE

All the authors declared no competing interests.

1. Agarwal KA, Patel H, Agrawal N, Cardarelli F, Goyal N. Cardiac outcomes in isolated heart and simultaneous kidney and heart transplants in the United States. *Kidney Int Rep.* 2021;6:2348–2357. <https://doi.org/10.1016/j.ekir.2021.06.032>.

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Received 4 October 2021; accepted 11 October 2021; published online 22 November 2021

Kidney Int Rep (2022) 7, 125; <https://doi.org/10.1016/j.ekir.2021.10.024>

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In Reply to “Letter Regarding ‘Cardiac Outcomes in Isolated Heart and Simultaneous Kidney and Heart Transplants in the United States’”



The Authors Reply: We thank Dr. Okumura *et al.* for their interest in our study on outcomes in simultaneous kidney and heart transplants in the United States.¹ We appreciate the suggestions on alternate statistical methods and will keep them in mind for future work. On the basis of our current analysis, we found a survival advantage of simultaneous kidney-heart transplants over heart transplant alone in the subgroup of patients who were on dialysis and those not on dialysis with an estimated glomerular filtration rate < 45 ml/min. This effect was found for the entire cohort of recipients from October 1, 1987, to September 30, 2019, as opposed to the authors’ limited cohort (recipients between 2015 and 2020). Our results are

also consistent with previous studies by Karamlou *et al.*² and Habib *et al.*³

Furthermore, when we stratified our cohort according to eras, 1987 to 2007 and 2008 to 2019, we did find a significant improvement in the overall patient and graft survival of heart transplant alone recipients. This is consistent with recently published 30-year trends in heart transplantation.⁴ The simultaneous kidney-heart transplant recipients did not have similar improvement between eras (Supplementary Figures 1 and 2).¹ Therefore, the improved survival of heart transplant alone recipients as noted by the authors could be because of a limited cohort in 2015 to 2020, limited follow-up on patients transplanted during this recent period, and overall national improvement in heart transplant outcomes.

We agree with the authors on the need for further analysis, including further substratification based on the year of transplant and donor/recipient characteristics. This will add to the current literature.

DISCLOSURE

All the authors declared no competing interests.

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2. Karamlou T, Welke KF, McMullan DM, et al. Combined heart-kidney transplant improves post-transplant survival

compared with isolated heart transplant in recipients with reduced glomerular filtration rate: analysis of 593 combined heart-kidney transplants from the United Network Organ Sharing Database. *J Thorac Cardiovasc Surg.* 2014;147:456–461.e1. <https://doi.org/10.1016/j.jtcvs.2013.09.017>.

3. Habib P, Patel P, Hodge D, et al. Pre-orthotopic heart transplant estimated glomerular filtration rate predicts post-transplant mortality and renal outcomes: an analysis of the UNOS database. *J Heart Lung Transplant.* 2016;35:1471–1479. <https://doi.org/10.1016/j.healun.2016.05.028>.
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Received 7 November 2021; accepted 8 November 2021; published online 27 November 2021

Kidney Int Rep (2022) 7, 125–126; <https://doi.org/10.1016/j.ekir.2021.11.014>

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