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LETTER TO THE EDITORS

The long-term outcomes in liver transplantation using donation after circulatory death grafts

Yuki Bekki & Dagny Von Ahrens

Icahn School of Medicine at Mount Sinai, Recanati-Miller Transplantation Institute, New York, NY, USA
E-mail: yuki.bekki@mountsinai.org

Dear Editors,

We read with great interest the manuscript by Sasaki *et al.* [1] Because conditional survival in donation after circulatory death liver transplantation (DCD LT) was inferior in the long-term using national registry data from 2002 to 2017, the authors ascribed the protracted higher risks inherent to DCD liver grafts. We independently analyzed the Scientific Registry of Transplant Recipients database of the same study population over the same study period. Although the authors should be congratulated on a substantial effort and nuanced

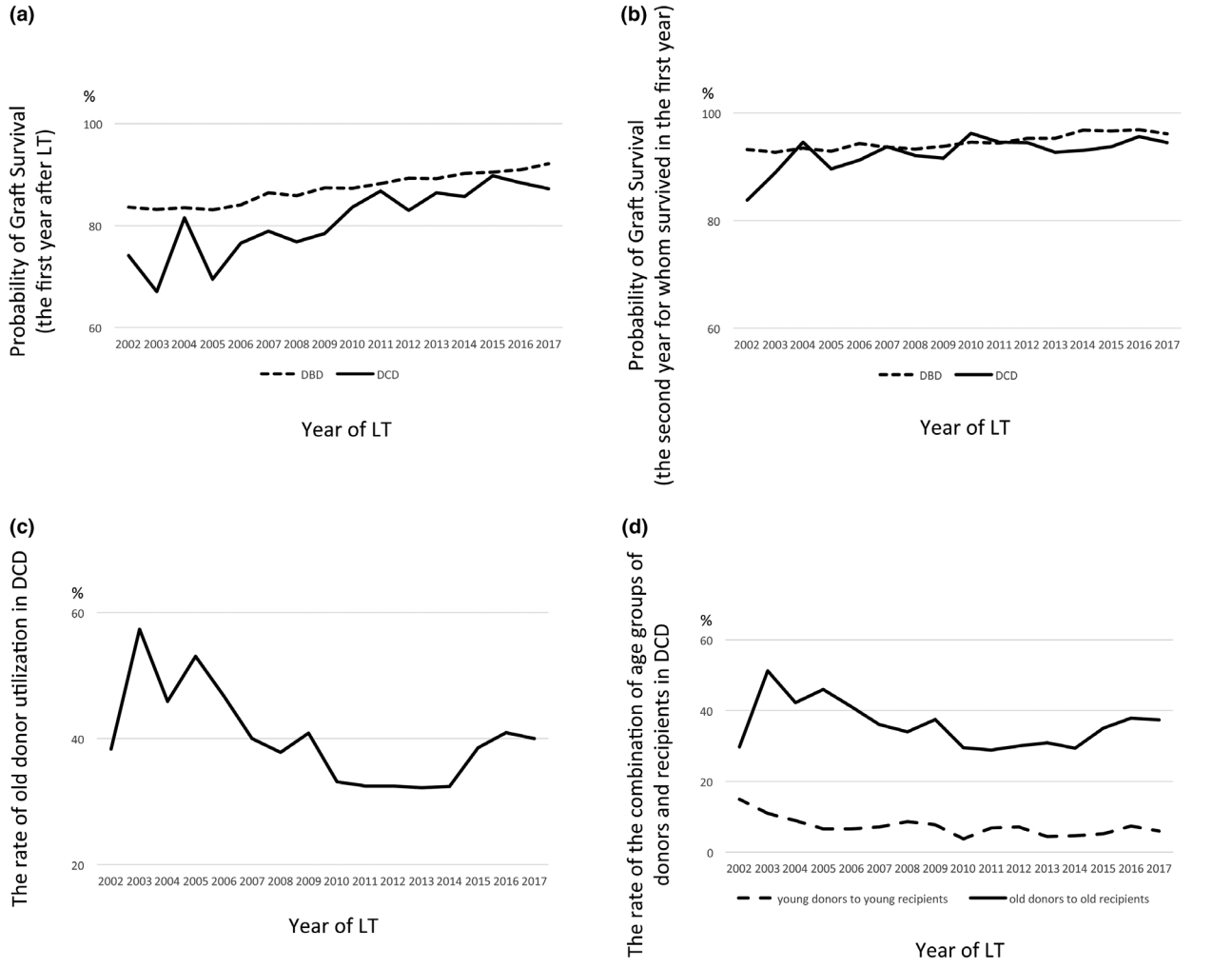

Figure 1 Trends in LT between 2002 and 2017. (a) DBD and DCD graft survival in the first year after LT. (b) DBD and DCD graft survival in the second year for whom survived the first year after LT. (c) The percentage of old donors in DCD LT. (d) The percentage of the combinations of age groups in donors and recipients.

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approach, our analysis suggests several points warrant emphasis to interpret the authors' work in the proper context.

First, "the protracted higher risks" in the authors' analysis may have derived from the improvement in DCD LT over the last decade. The graft survival rate in the first year and the second year for who survived in the first year was shown in the Fig. 1a and b, respectively. There has been the less gap between DBD and DCD LT over the study period not only in the first year but also in the following year. This result suggests that there have been factors (such as the refined donor and recipient selection for DCD LT) [2] other than DCD graft type and transplant year affecting the long-term outcomes. Since the gap in graft survival between DBD and DCD has improved after 2011 [2], further study evaluating 2011 or later may prove the long-term impact of DCD grafts.

Second, the authors state that "young donor age organs should be applied for young recipients" in DCD LT. Given median recipient age was 57, defining young recipients as 45 years old or younger in this study seems overly selective. In addition, there has been a dynamic change in age groups of donors and recipients. The utilization of old donors was defined as more than 40 years old (Fig. 1c), and the combination with old recipients (Fig. 1d) have been high in the early years, with subsequent decrease until the last 3 years. The survival analysis in Fig 5 in the authors' study shows interesting trends: graft survival in young recipients from old donors reaches a plateau after 72 months, while that from young donors decreases after 72 months of LT. The long-term survival difference can be derived from the variations of age groups between transplant years, rather than the matching of donors to recipient age groups.

Finally, it is unclear whether conditional survival estimates or unadjusted Kaplan-Meier estimates is more reliable to compare DBD and DCD LT. DCD is recognized as extended criteria donors in LT, which can achieve comparable outcomes to standard criteria donors only when appropriately donors and recipients are matched [3]. In the authors' study, Cox regression analysis adjusted with donor age, CIT, and MELD scores showed that the DCD graft was a significant poor predictor. This result underscores the importance of careful risk adjustment in DCD LT [4], but does not necessarily mean DCD LT has equal inferior outcomes to all LT candidates. Long-term prognostic influence of DCD LT is focusing the interest, and the evaluation should be performed in the appropriately selected DCD LT.

Despite these critiques, the study makes a strong argument for the long-term influence of DCD LT. Given the increasing number in DCD LT, the impact on long-term outcomes must be evaluated.

Conflicts of interest

The authors declare no conflicts of interest.

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