



The UK DCD Risk Score: Still no consensus on futility in DCD liver transplantation

To the Editor:

The UK DCD Risk Score, recently published in March 2018, stratifies controlled donation after circulatory death (cDCD) liver recipients according to 7 variables and aims to predict 1-year graft survival. Donor age >60 years, cold ischemia >6 hours, and recipient lab Model for End-stage Liver Disease score >25 are assigned 2 points each; donor body mass index >25, functional warm ischemia >20–30 minutes, and recipient age >60 years 3 points; functional warm ischemia >30 minutes 6 point and retransplantation 9 points. Scores of 0–5 are “low-risk” (estimated 1-year graft survival >95%), 6–10 “high-risk” (1-year graft survival >85%), and >10 “futile” (1-year graft survival <40%).¹

We have recently reported the Spanish experience with cDCD liver transplantation, including all grafts transplanted between 2012 and 2016 and comparing outcomes between grafts undergoing either post-mortem normothermic regional perfusion (NRP, n = 95) or super rapid recovery (SRR, n = 117).² The median UK Score for cDCD livers transplanted in the study was 5 (interquartile range 3–6) with NRP and 5 (3–7) with SRR. Among cDCD livers transplanted with NRP, 70 were “low-risk” (74%), 22 “high-risk” (23%), and 3 “futile” (3%). When graft survival was stratified according to UK risk class, we observed 100% 1-year graft survival among livers in the “futile” group, 91% 1-year graft survival among livers in the “high-risk” group, and 87% 1-year graft survival among livers in the “low-risk” group (Fig. 1A). Among cDCD livers transplanted with SRR, 64 of the transplanted livers were classified as “low-risk” (55%), 48 “high-risk” (41%), and 5 “futile” (4%). When graft survival was analysed according to UK risk class among cDCD livers with SRR, the survival curves were virtually the same in all 3 groups, with 81%, 85%, and 80% 1-year graft survival rates, respectively (Fig. 1B).

Of note, the only graft that was lost in the “futile” group was secondary to patient death due to early hepatocellular carcinoma recurrence in a “Milan in” recipient.

Aside from the fact that the use of post-mortem NRP led to significant improvements in cDCD liver graft survival in general, the UK Score still failed to accurately predict outcomes of livers undergoing standard preservation with SRR. In order to determine why this might be, one should consider i) the components of the score itself and ii) how cDCD liver transplantation practice patterns may have artificially minimized if not entirely eliminated the effects of certain important risk factors.

The UK Score aims to predict risk and futility in the context of cDCD liver transplantation, taking into account the fact that the initial warm ischemic injury makes these grafts more marginal than similar livers recovered through donation after brain death. However, 3 of the 7 variables considered – recipient lab model for end-stage liver disease and age and retransplantation – have nothing to do with the graft itself. According to the UK Score, a 61-year-old recipient undergoing retransplantation is a futile procedure, regardless of the relative marginality or not of the graft used. It is well known that results of retransplantation are inferior to those of primary liver transplantation, yet no one would consider retransplantation a universally futile venture. Results of transplantation for acute liver failure are also inferior to those of transplantation for other indications, in particular during the first year, yet this indication is not considered in the UK Score, very likely because cDCD livers are rarely – if ever – used for acute liver failure recipients.

This last fact raises another very important point: when there has been previous manipulation of the inputs, some of the most important risk factors may appear less important or

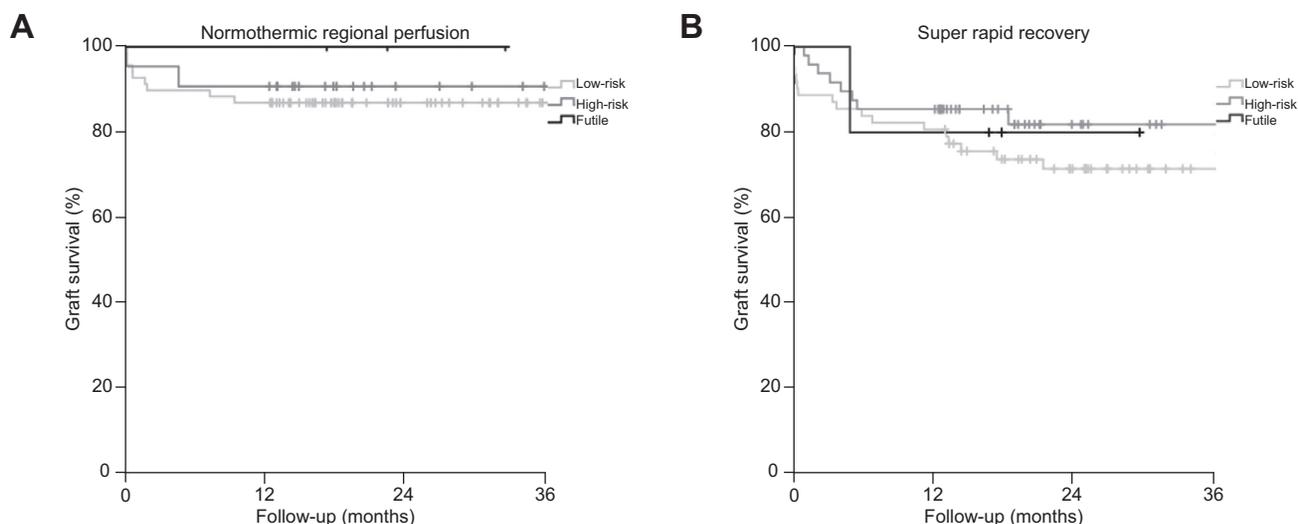


Fig. 1. Kaplan-Meier survival curves for cDCD livers. Livers recovered with post-mortem (A) normothermic regional perfusion or (B) super rapid recovery, stratified according to UK DCD risk score class. cDCD, controlled donation after circulatory death.

not even appear at all in a final risk stratification score. The UK Score considers donor age, repeatedly cited as a risk factor for the development of ischemic-type biliary lesions and, consequentially, graft loss,³⁻⁷ to be less relevant in predicting 1-year graft survival than recipient age, which has never been identified in any prior study as significantly associated with cDCD liver transplant outcomes. Upon examination of the training and test populations used to formulate and validate the UK Score, it becomes clear, based on median ages of 49 and 34 years, respectively, that many livers from older cDCD donors were previously excluded during the donor evaluation/organ recovery stage. Consequentially, when the UK Score was applied to the cDCD liver transplants performed in the aforementioned Spanish series, where the donor age was higher (median 56–57 years), it performed poorly regardless of the recovery method used.

Overall, our results indicate that the UK DCD Risk Score is not very useful for predicting outcomes after cDCD liver transplantation in our setting. While risk scores may be useful to stratify some groups of patients and guide clinical decisions, their utility may decline significantly when they are created using restricted populations and later applied to groups with distinct or broader characteristics.

Conflict of interest

The authors declare no conflicts of interest that pertain to this work.

Please refer to the accompanying [ICMJE disclosure](#) forms for further details.

Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jhep.2019.01.004>.

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