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LETTER TO THE EDITOR

Reply to: Asystole to cross-clamp period predicts development of biliary complications in liver transplantation using donation after cardiac death donors

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Dear Sirs,

The recent article by Taner *et al.* [1.] shows that asystole to cross-clamp (ACC) time is a significant predictor for the development of intrahepatic bile duct strictures and overall biliary complications after liver transplantation. This study was performed with a dataset containing 215 donation after cardiac death (DCD) liver transplantations performed at the Mayo Clinic, Florida, US. After investigation of various time points during the DCD procedure, the authors concluded that the ACC period is the most important risk factor predicting biliary complications after liver transplantation.

A worldwide consensus on the definition of the 1st/donor warm ischemia time (WIT) does not exist. Within the Eurotransplant region, the WIT is defined as time from cardiac arrest (asystole) up to the start of cold perfusion (cross-clamp) [2], whereas in most American literature, the WIT is defined as time from withdrawal of ventilatory support up to the start of cold perfusion. This problem was already addressed previously by Detry *et al.*in an article about DCD liver transplantation in Belgium [3].

In 2004, a definition of the WIT was proposed at an American national conference on DCD. WIT was defined as having two phases: the withdrawal phase (time from withdrawal of ventilatory support to cardiopulmonary cessation) and the acirculatory phase (time from cessation of circulation to the initiation of cold perfusion) [4]. However, this definition still does not account for decrease in O_2-saturation or blood pressure during the withdrawal phase.

In 2009, a recommendation by the American Society of Transplant Surgeons (ASTS) on DCD procurement and transplantation described WIT as follows: true WIT (interval between significant ischemic insult, such as a drop in MAP <60 mmHg, and initiation of perfusion) and total WIT (interval between discontinuation of mechanical ventilation and initiation of perfusion) [5]. As this study was performed at an American (UNOS) liver transplant center, we are curious to know why the authors used the measure points O2-sat <30% and SBP <50 mmHg instead of the measure points as proposed by the ASTS. It may be interesting to see whether the "true WIT" would have a stronger correlation with outcome as the ACC time.

Altogether, an important issue is addressed in the article by Taner *et al.*; WIT and the different time points of that WIT (true and total) correlate with outcome after DCD liver transplantation (and more specifically biliary complications). Interestingly, the only significant period in the multivariate analysis, the ACC period is actually the WIT as currently used by Eurotransplant. A clear definition and consensus of the definition of WIT is warranted; hence, this important risk factor can be used properly in the decision-making process of a DCD liver allograft offer. We congratulate the authors with this very interesting article, which will hopefully (re)initiate a worldwide discussion on how to properly define WIT.

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Conflicts of interest

The author of this manuscript have no conflict of interest.

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