Original Article

Prolonged warm ischemia exacerbated acute rejection after lung transplantation from donation after cardiac death in a mouse

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Abstract

Objective: In lung transplantation (LTx) from donation after cardiac death (DCD), the donor lungs are inevitably exposed to warm ischemic time (WIT) between the cardiac arrest and the initiation of cold preservation. We conducted this study to examine the effect of prolonged WIT on lung allograft rejection in a murine model of LTx from DCD.

Methods: Allogeneic BALB/c→ B6 LTx from DCD was performed with a WIT of 15 minutes (WIT15 group, n = 5) or 60 minutes (WIT60 group, n = 5). Recipients were immunosuppressed by perioperative costimulatory blockade. The lung allografts were analyzed by histology and flow cytometry on day 7 after the LTx.

Results: Histologically, the rejection grade in the WIT60 group was significantly higher than that in the WIT15 group (3.4 ± 0.4 vs. 2.2 ± 0.2, P = 0.0278). Moreover, the intragraft CD8+ to CD4+ T cell ratio in the WIT60 group was significantly higher than that in the WIT15 group (2.3 ± 0.12 vs. 1.2 ± 0.11, P < 0.0001).

Conclusions: Prolonged WIT could exacerbate the severity of lung allograft rejection after LTx from DCD. Minimization of the WIT could improve the outcomes after LTx from DCD.