Abstracts
23rd European Conference on General Thoracic Surgery
31 May–3 June 2015, Lisbon, Portugal

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WARM VERSUS COLD DONOR LUNG ISCHAEMIC PRESERVATIONS ACTIVATE DISTINCT MECHANISMS DURING DEVELOPMENT OF POST-TRANSPLANT PULMONARY DYSFUNCTION
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Objectives: Ischaemia-reperfusion injury related to lung transplantation (LTx) is a major contributor to early postoperative morbidity and mortality. Severe lung injury is seen when using donor lungs after prolonged hypothermic preservation or donation after cardiac death. We hypothesized that different injury mechanisms will be associated with increased cold and warm ischaemic times (CIT and WIT).

Methods: Donor lung injury was induced with (i) 18 h CIT after harvest, and (ii) 3 h WIT before retrieval. Twelve hour CIT was used as a low-injury control. Left single LTx was performed using a separate ventilation technique. After 2 h of reperfusion, pulmonary vein blood gases were analysed, and the grafts and plasma were harvested for multi-cytokine and M65 assays.

Results: Pulmonary oxygenation was significantly worse in both 18 h CIT and WIT groups, with higher peak airway pressures during the reperfusion, compared to the control. Interleukin (IL)-1α, IL-1β, IL-6, VEGF, and chemokines CCL2, CCL3, CXCL1, and CXCL2 were up-regulated in all groups when comparing end-reperfusion time points to pre-transplant. Notably, graft tissue levels of these analytes were significantly lower in the WIT group compared to the CIT groups. Conversely, systemic plasma levels of all analytes were elevated in the WIT group. Levels of plasma M65 were not detectable in the 12 h CIT group, but were significantly elevated in both 18 h CIT and WIT groups.

Conclusions: Compared to 12 h CIT, pulmonary physiology deteriorated to a similar degree in both the 18 h CIT and 3 h WIT groups. However, the inflammatory response was more severe locally in grafts after 18 h CIT, whereas the systemic response and cell death signal (M65) were more severe in the WIT group. The distinct inflammatory responses indicate that the type of donor lung injury should be carefully considered when developing specific therapeutic strategies to reduce lung injury.

Disclosure: No significant relationships.