PP_112 LEUKOCYTE REMOVAL REDUCES INFLAMMATORY GENE EXPRESSION IN LIVERS UNDERGOING NORMOTHERMIC PERFUSIONS

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Background: Ex situ normothermic perfusion (ESNP) is a method to evaluate and potentially recondition organs before transplantation. However, increased expression of inflammatory molecules, including by tissue-resident immune cells, may occur during the perfusion process, potentially negating the beneficial effects of perfusion.

Methods: We used RNA sequencing to assess gene expression in 31 livers undergoing ESNP, including 23 donated after circulatory death (DCD) and 8 donated after brain death. In 7 DCD livers, a leucocyte filter was added to the circuit during perfusion. Biopsies were available for transcriptomic assessment in all cases at the start of perfusion and at varying time points postperfusion.

Results: During ESNP in DCD livers, we observed an increase in proinflammatory, profibrinolytic, and prorepair pathway genes. *SERPINE1*, encoding plasminogen activator inhibitor-1, was among the genes most significantly upregulated during perfusion in DCD livers, potentially promoting fibrin clot persistence in vasculature. We also found increased expression of monocyte and neutrophil recruiting chemokine and proinflammatory cytokine transcripts during ESNP, but several prorepair molecules, including thymic stromal lymphopoietin, were also upregulated. In both DCD and donation after brain death livers, interferon-gamma response genes were enriched, whereas oxidative phosphorylation genes decreased in organs with high perfusate alanine transaminase, a biomarker associated with adverse clinical outcomes. The inclusion of a leukocyte filter in the perfusion circuit mitigated the induction of inflammation/immune pathway genes during perfusion and was associated with enrichment in oxidative phosphorylation genes.

Conclusions: Leukocyte removal during ESNP abrogates transcriptional changes that are associated with unfavorable clinical outcomes, potentially benefiting human livers undergoing ESNP.

PP_113 NATIONAL IMPLEMENTATION OF HMP INCREASES LOCAL KIDNEY UTILISATION RATE AND IS HIGHLY COST-EFFECTIVENESS

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Background: Given the improved outcomes for higher-risk kidneys that are preserved by hypothermic machine perfusion (HMP), Belgium introduced reimbursement for this technique for expanded criteria donors (ECD) and kidneys donated after circulatory death (DCD) since 10/2022. The underlying hypothesis for reimbursement was to increase the national utilization rate of higher-risk kidneys from Belgian donors. This study presents the observed trends in national kidney transplantation rates of these kidneys before and after the reimbursement of HMP. We also present a cost-effectiveness analysis.

Methods: Data were retrospectively collected from Belgian donors transplanted between 10/2017 and 03/2024. Before 10/2022, the vast majority of these kidneys was preserved by cold storage.

Results: The national implementation of HMP resulted in 1) an increase of the total number of KT Belgian DCD and ECD donors regardless of donor age (Figure 1a), 2) an important increase in national transplantation rate (Figure 1b). The observed increase was more pronounced in the donor age groups between 50 and 65 years old and above 65 years, but not for DCD kidneys with donor age below the age of 50. 3) The cost-effectiveness was 4.365.651€ saved 1 year after its implementation (based on costs of HMP (3500€/procedure) and dialysis (44.932€/year/patient) but excluding hospitalization and immunosuppressive treatment costs during the first year).

Conclusions: The reimbursement and nationwide implementation of HMP for kidneys procured in Belgium resulted in an important increase of the national transplantation rate of ECD and DCD kidneys and was highly cost-effectiveness.