BSW 2025 Submission 58

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Submission 58	
Title	Mesenchymal Stromal Cell Therapy during Kidney Preservation under Normothermic Machine Perfusion: a Placebo-controlled Study in a Pig Model
Track	Abstracts BSW 2025
Author keywords	Transplantation Stem cell Normothermic Perfusion
Topics	Abdominal
Abstract	Background: Kidneys from DCD or ECD are increasingly used in transplantation, although of suboptimal quality. Advanced preservation strategies, such as normothermic machine perfusion (NMP), may mitigate ischemic injury. Additionally, mesenchymal stromal cells (MSCs), known for their immunomodulatory and tissue-repair properties, offer a potential therapeutic approach. However, concerns regarding the toxicity of MSC injection directly into the renal artery persist. We assess the safety and efficacy of MSC administration during NMP in a paired placebo-controlled blinded study in pigs. Methods: Pig kidneys (n=10) underwent 30 minutes of warm ischemia and 3 hours of cold ischemia before 6 hours of NMP at 37°C. After 45 minutes of NMP, 10 million human MSCs were injected into the renal artery of one kidney, while the contralateral kidney received a similar volume of placebo. Blinding was secured throughout the experimentation, including stats. Perfusion parameters were continuously monitored. Creatinine and iohexol clearances were assessed. Urine output and perfusate samples were collected hourly in order to quantify cytokine levels (e.g., IFN-γ, IL-2, IL-10, IL-1α, IL-6, TNF-α, IL-1β, IL-8). Results: No significant differences were observed in perfusion parameters (flow, pressure, vascular resistance) between MSC-infused and placebo-treated kidneys, indicating the absence of perfusion disturbances caused by MSCs. Similarly, no significant differences were found in arterial blood gas metrics. NGAL levels in the perfusate showed a progressive increase in both groups and it reached comparable final concentrations. Additional analyses are ongoing to assess the release of cytokines, as well as the clearances of creatinine and iohexol. Conclusions: Our blinded, placebo-controlled, paired NMP pig model demonstrates that MSC administration into the renal artery is safe, without vascular toxicity or perfusion disturbances. The biological and histological assessment of MSC nephroprotection is ongoing.
Submitted	Feb 06, 09:56 GMT
Last update	
Address	Avenue de l'Hopital 1 Liege, 4000 Belgium
Awards	I am younger than 35 years at the start of the conference, 24th of April 2025. Being the first author, I am already a member of RBSS or will become an RBSS member before January 31st 2025. I agree with the prizes-and-awards-regulations as mentioned on the website of RBSS.
Author conflicts	none

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