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SAFETY AND FEASIBILITY OF 2 HOURS NORMOTHERMIC MACHINE PERFUSION OF DONOR KIDNEYS IN THE EUROTRANSPLANT SENIOR PROGRAM

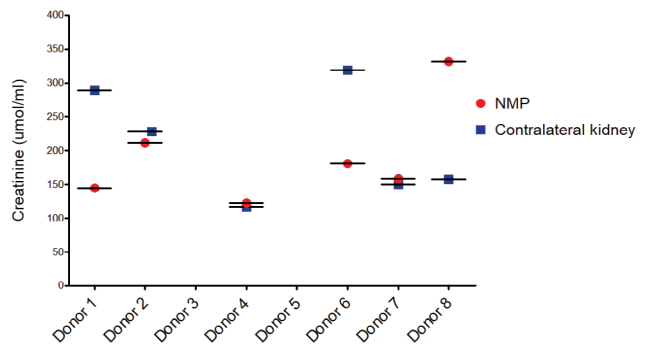
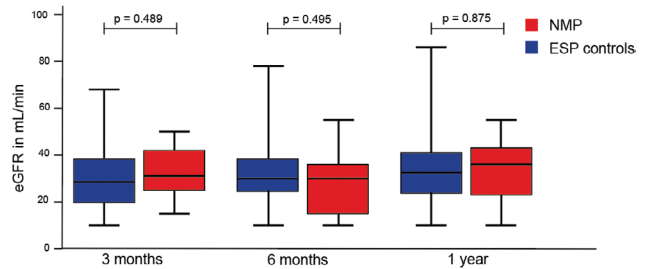
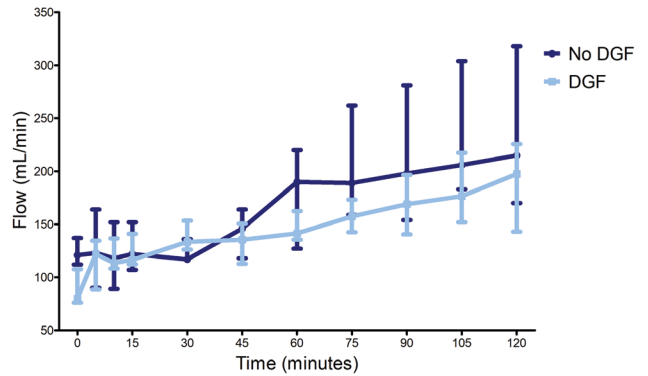
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Introduction: Due to suboptimal quality of elderly donor kidneys transplanted in the Eurotransplant Senior Program (ESP), graft survival has shown to be only 47% after 5 years. Recently, normothermic machine perfusion (NMP) regained interest as a preservation method to optimize marginal donor kidneys to improve outcomes. Because of the lack of experience with this technique, we aimed to investigate the safety and feasibility of implementing NMP in the ESP population.

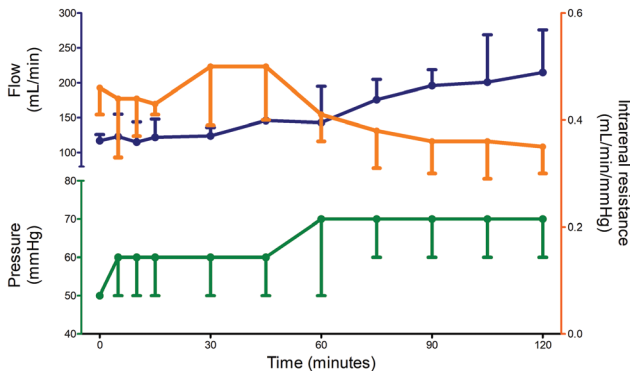
Methods: In 2018, ESP patients awaiting deceased donor kidney transplantation were prospectively asked to participate in a pilot study. Before implantation, the donor kidney was placed on 2 hours NMP at 37°C with an oxygenated, plasma-free red cell-based solution at a mean pressure of 60 mmHg with additional nutrients to maintain homeostasis. Flow, intrarenal resistance and pressure during NMP were continuously measured. Our primary outcome was safety and feasibility. As secondary outcome, we assessed graft outcome such as the incidence of delayed graft function (DGF), primary nonfunction (PNF), eGFR after 1 year, and biopsy proven acute rejection (BPAR) within 3 months. Graft outcome was compared to a historical cohort of consecutive ESP controls (n=54) and to the contralateral kidneys (n=8). Linear regression analysis was used to investigate any differences in flow during NMP among immediate functioning kidneys and kidneys with DGF/PNF.

Results: Eleven patients were included. No adverse events occurred, especially no arterial complications or primary nonfunction. After 120 minutes, median flow increased from 117 ml/min (IQR 80-126) to 215 ml/min (IQR 170-276) (p=0.001). No significant differences were observed between the NMP ESP patients and the ESP historical control group. For graft outcome, the incidence of delayed graft function (DGF)/primary nonfunction (PNF) was 36% in the NMP group and 63% in the historical controls (p=0.103). There were no statistical significant differences in eGFR up to 1 year post-transplantation, graft and patient survival and BPAR. Linear regression analysis revealed a significantly higher increase in flow in immediate functioning kidneys compared to DGF kidneys (no DGF: slope 1.18 ±0.14 vs. DGF: slope 0.70 ±0.09, p=0.014).

Conclusion: NMP is safe and feasible in ESP kidneys and may impact the incidence of DGF. A well-powered study is warranted to investigate the potential advantages of NMP on graft outcome.



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