MACHINE PERFUSION VERSUS COLD STORAGE IN TRANSPLANTATION OF KIDNEYS FROM OLDER DECEASED DONORS: RESULTS OF A PROSPECTIVE RANDOMIZED MULTICENTER TRIAL

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Rationale: Delayed graft function after renal transplantation especially from older donors negatively correlates with long and short term graft function and graft survival. Retrospective studies suggest a beneficial effect of hypothermic machine perfusion (MP) on post- transplant outcome when compared to standard cold storage (CS) preservation.

Aim: Comparison of post- transplant outcome after machine perfusion vs cold storage in recipients of kidneys derived from deceased donors ≥ 55 years

Methods: As part of an international prospective randomized controlled trial n=118 consecutive donation after brain death donors aged 55 years and older were included between November 2005 and November 2006. In each donor one kidney was randomly assigned to MP and the contralateral kidney to conventional CS. Eurotransplant standard allocation algorithms were not affected by the trial. The accepting recipient center was blinded regarding preservation mode and perfusion parameters. Primary endpoint of the study was delayed graft function defined as necessity of dialysis in the first seven days after transplantation. Furthermore standard donor and recipient data were collected, as well as graft and patient survival, primary non function (PNF) and acute rejection episodes. All 236 recipients were prospectively followed up until six months after transplantation.

Results: Donor age was 63 yr (55-81). Baseline demographics were comparable between the MP vs the CS arm: recipient age (year) 63 (11-79) vs 61 (7-79). p=0.8; preTx dialysis duration (days) 1728 (417-5154) vs 1773 (149-3866). p=0.5;% current PRA (0-5/6-84/85+) 105/12/1 vs 109/8/1, p=0.3;% of 0 HLA A,B and DR mismatches was 8.5 vs 11, p=0.3. Cold ischemia time (CIT) (hr) was 14 (3.5-53.75) in MP vs 13 (2.5-25) in CS (p=0.6). Incidence of DGF was 22.0% in MP vs 31.4% in CS recipients, p=0.07. DGF < 7days occurred in 10/26 in the MP vs 5/37 in the CS arm, p= 0.02. PNF rate was 2.5% in MP vs 10.2% in CS kidney recipients (p=0.015) Creatinine clearance showed no differences at day 7 and 14. The rate of acute rejections was not different between the groups. When DGF occurred six month graft survival was significantly better in kidneys preserved with MP than by CS: 84% vs. 60%, p=0.026. Logistic regression analysis showed that MP (p=0.015; Odds ratio 0.432 vs CS) and CIT (p< 0.0001; Odds ratio 1.145) independently impacted on DGF.

Conclusion: Hypothermic machine perfusion of kidney grafts from older deceased donors lowers the incidence and duration of delayed graft function, strongly reduces primary non-function and improves graft survival at six months post- transplant.