Machine Perfusion *Versus* Cold Storage Preservation in Non-Heart-Beating Kidney Donation and Transplantation: Results of a Multicentre Trial in Eurotransplant.

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Rationale: Delayed Graft Function (DGF) > Kidney Transplantation (KTx) causes morbidity/cost, and negatively affects graft function/survival. Kidney grafts from Non-Heart-Beating Donors (NHBD) exposed to cold+warm ischemia are highly vulnerable to DGF. Compared to Cold Storage (CS), hypothermic Machine Perfusion (MP) may provide better preservation for NHBD kidneys, but evidence to support this view is limited.

Aim Compare efficacy of MP *vs* CS for preserving NHBD kidneys.

Methods: In an international prospective randomized controlled trial we enrolled kidney pairs of 82 consecutive NHBD (Maastricht category 3/awaiting cardiac arrest). 1 kidney was randomly assigned to MP; the other to CS. Kidneys were allocated using standard algorithm. At time of offer, preservation type (MP *vs* CS) and perfusion parameters were not revealed. All 164 recipients were followed-up and 3-mth data were analyzed.

Results: Donor age (y): 43 (17-67). Demographics were comparable between MP *vs* CS: Recipient age (y) 49 (24-73) *vs* 52 (24-77), p=0.81; preTx dialysis duration (days) 1542 (366-6402) *vs* 1448 (132-3904), p=0.48; first/reTx 34/48 *vs* 34/48, p=0.56; % current PRA (0-5/6-84/85+) 71/11/0 *vs* 71/10/1, p=0.73; % of 0 HLA A,B and DR mismatches was 2.4 *vs* 3.7, p=0.5. Cold Ischemia Time (CIT) (h) was 15 (4.3-28.9) for MP *vs* 15.9 (8.6-46.6) for CS (p=0.7). Incidence of DGF was 53.7% in MP *vs* 69.5% in CS, p=0.027. Duration of DGF (days) was 9 (1-48) in MP *vs* 13 (2-43) in CS, p=0.04. DGF <7days occurred in 12/32 (27%) in MP *vs* 6/51 (10.5%) in CS, p= 0.028. Creatinine clearance (ml/min) at d7, d14, 1mth, and 3mth in MP *vs* CS was: 13 *vs* 9, p=0.009; 23 *vs* 13, p=0.001; 46 *vs* 38, p=0.078; and 57 *vs* 49, p=0.19, resp. PNF rate was identical after MP and CS (2.4%). Acute rejection rate: 7.3% in MP *vs* 12.2 % in CS; p=0.22. Graft loss (<3m) was identical after MP and CS (3.6%). Patient survival was 98.7% in MP *vs* 100% in CS. Logistic regression analysis showed that MP (p=0.035; Odds ratio 0.476) and CIT (p=0.009; Odds ratio 1.118) independently impacted on DGF.

Conclusion: This study demonstrates for the first time in a large controlled trial that MP of NHBD kidneys reduces *incidence*, *duration* and *severity* of DGF and ameliorates graft function after KTx. 1-yr results will be presented.