Renal Resistance during Machine Perfusion Is a Risk Factor for Delayed Graft Function and Poorer Graft Survival

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Introduction: Renal Resistances (RR) during Machine Perfusion (MP) are used to discard kidneys likely to fail postTx but threshold RR (above which kidneys are discarded) have been determined empirically. We studied the prognostic value of RR on Delayed-Graft-Function (DGF), Primary-Non-Function (PNF), graft survival.

Methods: An international/prospective trial including kidney pairs of 336 consecutive Heart-Beating (HB) & Non-Heart-Beating (NHB) donors shows that MP leads to less DGF & prolonged graft survival *vs* Cold Storage (CS). In this trial, recipient centres were blinded to preservation method (MP/CS) and to MP parameters. Surgeon decision to accept/discard kidneys was solely based on traditional donor data. In MP arm, the RR (mmHg/mL/min-Real Time) on LifePortKidney-Transporter was recorded (30'/1h/2h/4h/MP end). Univariate/multivariate analyses were done to determine impact of RR on DGF/PNF/graft survival.

Results: Higher RR at different time-points resulted in higher % DGF (17.3%*vs*37.9% for RR:0.28 at MP end). RR was associated with increased Odds Ratio for DGF(OR 2.69;p=0.03 for RR:0.28 at MP end) independent of donor-type (HB*vs*NHB), -age, cold-ischemia-time, reTx *vs* firstTx. Highest RR groups showed highest serum creatinine up to 3 months postTx. RR was linked to risk of 1year graft loss; in case of DGF, RR threshold of 0.28 at MP end resulted in a 17% poorer graft survival *vs* immediately functioning grafts. Only 7 MP kidneys developed PNF; no discriminative RR to discard PNF kidneys was found.

Conclusion: This study demonstrates (for the first time) the exact prognostic value of RR during MP. RR correlates with DGF & graft survival, not PNF. Many kidneys with elevated RR were probably erroneously discarded in the past. PreTx knowledge of a given risk of DGF may help clinicians to select recipients and/or adjust immunosuppression (nephron-sparing protocol in high risk DGF grafts).

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