

The feasibility and applications of non-invasive cardiac output monitoring, thromboelastography and transit-time flow measurement in living-related renal transplantation surgery: results of a prospective pilot observational study

Publication Summary Document

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Objective

This pilot study was undertaken to assess the potential applicability of perioperative non-invasive cardiac output monitoring, transit-time flow monitoring (TTFM) of the transplant renal artery and pre-/perioperative thromboelastograph (TEG) in the early prediction of Delayed graft function (DGF) and perioperative complications for living-related renal transplantation.

Study

Ten consecutive living-related renal transplantation recipients were prospectively studied. Transit-time flow measurement of the transplant renal artery was performed using a flow probe (VeriQ, Medistim ASA, Oslo, Norway). Measurements were performed by the principal surgeon, during two natural intra-operative hemostatic pauses, immediately following allograft reperfusion and after cystoureteric anastomosis. For the purposes of this pilot study, the development of DGF was defined as the requirement for dialysis within seven days of allograft transplantation.

Results

TTFM Mean transplant arterial blood flow at reperfusion: 411 ml/ min (95% CI: 358 to 465) and following cysto-ureteric anastomosis: 480 ml/min (95% CI: 378 to 581; P = 0.11 – paired t-test). By comparison, a flow rate of only 227 ml/min was noted in one patient and turned out to be a case of partial transplant arterial thrombosis

Conclusion

TTFM data indicated a median transplant-arterial blood flow of 430 ml/min (95% CI: 351 to 472) following allograft reperfusion. One individual experienced intra-operative thrombosis of the transplant renal artery (at the anastomosis) and upon assessment, demonstrated an average flow rate of only 228 ml/min (lying outside the lower 95% CI for normal subjects). This reading was consistent with the intra-operative appearance of the allograft at reperfusion and facilitated the decision to immediately revise the anastomosis, perform thrombectomy and ultimately salvage the transplanted kidney. With a sufficiently powered study, a quantifiable flow rate associated with graft anastomotic complications and thus graft failure may be achieved, as is the case in AV-fistula surgery and CABG .

Medistim Comments

This pilot study assesses the potential applicability of perioperative non-invasive cardiac output monitoring (NICOM), transit-time flow monitoring (TTFM) of the transplant renal artery and pre-/perioperative thromboelastography (TEG) in the early prediction of DGF and perioperative

complications. In our short summary we have focused on the use of TTFM. Please use the link below to read the full study.

Reference

<http://www.transplantationresearch.com/content/3/1/16>