

Transplantation after Hypothermic Machine Perfusion Versus Static Cold Storage of Deceased Donor Kidneys: A Prospective Randomized Controlled Trial.

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Background: Static cold storage (CS) is the most widely used organ preservation method for deceased donor kidney grafts. Retrospective analyses have indicated that preservation by hypothermic machine perfusion (MP) may lead to improved outcome after renal transplantation. However, there is a lack of sufficiently powered prospective studies to test the presumed superiority of MP.

Method: In an international prospective randomized controlled trial we enrolled kidney paired of 336 consecutive deceased donors and randomly assigned one organ to MP and the contralateral kidney to CS preservation. Follow up was directed at all 672 recipients of these grafts. The primary endpoint was delayed graft function (DGF).

Results: MP significantly reduced the risk of DGF (OR 0.63; P=0.02) and more than halved the incidence of primary non-function after transplantation, when compared to CS (2.1 vs. 4.8%; P=0.04). Furthermore, MP significantly reduced the risk of graft failure in the first 6 months post-transplant (HR 0.46; P=0.05). In recipients who developed DGF, 6-month graft survival was better if their transplanted kidney was machine perfused (87 vs. 76%; P=0.05).

Conclusions: Hypothermic machine perfusion reduces the risk of delayed graft function, primary non-function, and graft failure in deceased donor kidney transplantation when compared to static cold storage. Furthermore, MP alleviates the deleterious effect of DGF on graft survival.