Administration of Third-Party Mesenchymal Stromal Cells at the Time of Kidney Transplantation: Interim Safety Analysis at One-Year Follow-Up

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Objective. Mesenchymal stromal cells (MSC) therapy has been suggested in kidney transplantation (KTx). We report on the 1-year follow-up of an open-label phase I trial using MSC at the time of KTx.

Methods. On postoperative day 3 (D3), third-party MSC (~$2.0x10^6$/kg) were administered to 7 non-immunized first-transplant recipients from deceased donors, under standard immunosuppression (Basiliximab, Tacrolimus, MMF and steroids). No HLA matching was required for MSC donors. In parallel, 7 comparable KTx recipients were included as controls. Written informed consent was obtained from all participants.

Results. No hemodynamic or immune-allergic side-effect was noted at the time of MSC injection. Still, 1 patient with a history of ischemic heart disease had a NSTEMI ~3h after MSC infusion. Four MSC patients presented with CMV reactivation within 165 ± 96 days *post* KTx, whereas 3 controls had positive polyoma-BK viremia within 92 ± 4d *post* KTx. Three MSC patients were affected by pneumonia within 269 ± 98d *post* KTx, whereas 3 controls had urinary infection within 48 ± 43d *post* KTx. No MSC engraftment syndrome was observed. At D14, eGFR in MSC and control groups was 47.1 ± 6.8 and 39.7 ± 5.9 ml/min, respectively (*p, 0.05*). At 1 year, eGFR in MSC and control groups was 43.1 ± 17.8 and 53.9 ± 13.4 ml/min, respectively (*p, 0.25*). At 3-month protocol biopsy, no rejection was evidenced in MSC or control patients. Later on, 1 acute rejection was diagnosed at D330 in 1 MSC patient. No biopsy-proven AR was noted in controls. Three patients developed anti-HLA antibodies against MSC (n=1) or shared kidney/MSC (n=2) mismatches.

Conclusions. MSC infusion was safe in all patients except one. Incidence of opportunist and non-opportunist infections was similar in both MSC and control groups. No MSC engraftment syndrome was documented. No difference in eGFR was found at 1 year *post* KTx. Putative immunization against MSC was observed in 3 patients.