

# Impact of pre-existing diabetes mellitus type 2 and post-transplant HbA1c in kidney transplantation

Fabian Halleck<sup>1</sup>, Dmytro Khadzhynov<sup>1</sup>, Anna Kleinsteuber<sup>1</sup>, Eva Schrezenmeier<sup>1</sup>, Lukas Lehner<sup>1</sup>, Michael Dürr<sup>1</sup>, Klemens Budde<sup>1</sup>, Oliver Staeck<sup>1</sup>

<sup>1</sup>Department of Nephrology, Charité Universitätsmedizin Berlin, Germany

**Background:** Limited data have been reported on the outcomes of kidney transplant recipients (KTR) with pre-existing diabetes mellitus type 2 (preDM) at time of transplantation and the influence of HbA1c levels post-transplant.

**Methods:** This retrospective single center study included 1164 KTR transplanted 1996-2014. Pre-transplant diabetes status and HbA1c levels 6-24 months post-transplant were determined. Cox proportional hazards models were fitted to examine the independent association of preDM, HbA1c and time-to-event outcomes with inclusion of recipient age, sex, time on dialysis, prior kidney transplantation, donor age, HLA-mismatches and cold ischemia time.

**Results:** Mean age was 51 years, mean post-transplant follow-up 6.0 years. 16% of the KTR had preDM, 9% preDM with diabetic end-organ damage (retinopathy, neuropathy or nephropathy) at time of transplantation. KTR with preDM were older (63 vs 51 years,  $p < 0.001$ ), had a larger BMI (28 vs 25 kg/m<sup>2</sup>), shorter time on dialysis (4.3 vs 5.8 years,  $p < 0.001$ ), lower rate of previous transplantation (9 vs 18%,  $p = 0.009$ ) and more HLA mismatches (3.2 vs 2.5,  $p < 0.001$ ) compared to KTR without preDM.

KTR with preDM showed significantly poorer patient survival compared to KTR without preDM (Fig 1A). Sub analysis of 262 elderly KTR with preDM showed a median survival time of 9.1 years in the group with preDM vs 6.4 years in the group without preDM (Fig 1B). There was no significant correlation between preDM and graft failures (Fig 1C). KTR with preDM had a significantly lower cGFR over the time (Fig 1D).

Multivariate analysis revealed that preDM was a main driver of mortality (HR 1.78;  $p = 0.001$ ). The relative hazard of death was even considerably higher in KTR with preDM and diabetic end-organ damage (HR 2.87;  $p = 0.001$ ). KTR with an HbA1c level  $> 6.5\%$  within 6-24 months post-transplant showed a significantly higher mortality while graft survival was not significantly affected (Fig 1E-F).

Adjusted multivariate analysis confirmed that HbA1c levels  $> 6.5\%$  6-24 months post-transplant are an independent predictor of death (HR 1.7;  $p = 0.05$ ).

**Conclusions:** preDM is a significant independent risk factor for death in KTR of all age categories. Data supports that HbA1c control after transplantation may be important to lower mortality.

Figure 1

