Association of preoperative non-HLA antibodies with kidney allograft rejection

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Background: Non-human leukocyte antigen (HLA) antibodies are thought to have an impact on kidney allograft rejection. We analyzed the titers of non-HLA antibodies in kidney transplant recipients at the time of transplantation and screened which antibodies are associated with kidney allograft rejection.

Methods: The study included 400 preoperative sera from kidney transplant recipients with biopsy-proven antibody-mediated rejection (ABMR, n=47), T-cell mediated rejection (TCMR, n=200), and controls without rejection (n=153) at Seoul National University Hospital between 2015 and 2021. A total of 41 types of non-HLA antibodies were analyzed by Luminex method (Labscreen Autoantibody and Labscreen Mixed, One Lambda, USA) and enzyme immunoassay (EIA-AT1RX, One Lambda, USA). In multivariable logistic regression analysis, the effect of DSA and HLA mismatch are adjusted.

Results: In multivariable analysis, occurrence of ABMR was related to the increase of anti-collagen type I (≥ 75 percentile value provided by the manufacturer, odds ratio [OR], 10.6; $P=0.001$) and the increase of anti-collagen type IV antibody (OR, 2.3; $P=0.033$). The occurrence of ABMR was decreased with the increase of anti-ARHGDIB (OR, 0.4; $P=0.007$), anti-collagen II (OR, 0.3; $P=0.001$) and anti-LG3 (OR, 0.3; $P=0.015$). Meanwhile, the occurrence of TCMR was associated with the increase of anti-collagen II antibody (OR, 2.1; $P=0.007$).

Conclusions: The increase of anti-collagen type I and type IV antibody titers at the time of transplantation was related to ABMR of kidney allografts. The increase of anti-ARHGDIB, anti-collagen II, and anti-LG3 antibody titers was related to the decreased occurrence of ABMR. Anti-collagen II antibody was related to the occurrence of TCMR. Further researches are needed on the mechanism by which each antibody acts in the rejection of kidney allografts.

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