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The Clinical Utility of Preformed C1q-binding donor-specific HLA antibodies in Kidney Transplantation

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Objectives:

Anti-human leukocyte antigen (HLA) antibodies are known for risk factor of allograft dysfunction in kidney transplantation (KT). De novo complement component 1q-binding donor-specific anti-HLA antibodies (C1q-binding DSAs) are reported to be associated with an increased risk of acute allograft rejection in KT. This study investigated the clinical utility of preformed C1q-binding DSAs for predicting graft outcomes in KT.

Methods:

From December 2016 to December 2018, 323 recipients underwent KT at Seoul St. Mary's Hospital. If panel reactive antibodies (PRA) were positive in the pre-transplant, DSAs and C1q-binding DSAs were performed using Luminex Single Antigen Bead Assay (SAB). Acute rejection and graft survival were compared between recipients with preformed C1q-binding DSAs and recipients without preformed C1q-binding DSAs.

Results:

Eighty-two of 323 recipients (25.4%) were evaluated DSAs and C1q-binding DSAs before KT. Among them, 40 recipients (48.8%) had preformed DSAs and 8 recipients (9.9%) had preformed C1q-binding DSAs. There were no significant difference in basic demographics except for administration of bortezomib for desensitization between C1q-binding DSAs(-) group and C1q-binding DSAs(+) group. The higher MFI values of DSAs had higher prevalence of C1q-binding DSAs (9263.9 ± 3670.3 vs. 5955.3 ± 5245.5; p = 0.050). There was a strong correlation between the presence of DSAs against Class II and C1q-binding DSAs (p = 0.007; CI 95%, OR 9.333). There was a correlation between positivity of crossmatch and preformed C1q-binding DSAs (p = 0.024;CI 95%, OR 6.042). Four of 8 recipients (50%) in C1q-binding DSAs(+) group were confirmed acute antibody-mediated rejection by allograft biopsy. This result showed that C1q-binding DSAs(+) group had significantly higher incidence of acute antibody mediated rejection than that of C1q-binding DSAs(-) group (p=0.044; CI 95%, OR 4.286).

Conclusions: The surveillance such as protocol allograft biopsy is required for early detection of acute antibody-mediated rejection after transplantation for patients with preformed C1q-binding DSAs.