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Impact of Persistent and Resolved de novo Donor-Specific Antibodies on Kidney Transplant Outcomes

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De novo donor-specific antibodies (dnDSA) are recognized as a critical risk factor for graft failure in kidney transplantation. However, the prognostic implications of the persistence or resolution of dnDSA after its initial occurrence remain poorly understood. This study aimed to investigate the transplant outcomes based on the presence of persistent or resolved dnDSA in kidney transplant recipients. We conducted a retrospective analysis on adult patients who underwent kidney transplantation at Severance Hospital between 2006 and 2020. During a median follow-up of 105 months, dnDSA was occurred in 444 recipients (33.6%, 444/1322). Death-censored graft survival was significantly inferior in patients with dnDSA compared to those without dnDSA. Among the 444 patients with dnDSA, 139 patients experienced resolution of dnDSA, while 305 patients maintained persistent dnDSA throughout the follow-up. The persistent dnDSA group exhibited a higher proportion of multiple dnDSA (34.8% vs. 18.0%, $P<0.001$) and class I + II combined presence (15.4% vs. 3.6%, $P=0.001$) compared to the resolved dnDSA group. The median total mean fluorescence intensity (MFI) value (4316 vs. 1449) and the median MFI value of immunodominant dnDSA (3887 vs. 1436) were both significantly higher in the persistent dnDSA group. The median follow-up duration after dnDSA occurrence was 49 months (IQR, 19.3-65.0), and no significant difference in death-censored graft survival was observed between the two dnDSA groups ($P=0.857$). Once dnDSA occurs, even if it resolves, it exerts a lasting detrimental effect on kidney transplant outcomes. Efforts to prevent the development of dnDSA are crucial in improving long-term kidney transplant outcomes.