Parallel Session 2: Implementing Research Findings in Clinical Practice

T2d - Enhancing the Clinical Management in Kidney Transplant Patients with Unknown Donor HLA Typing by a Modified Urine Typing Technology

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Introduction and Project Objectives: Kidney transplantation is the most cost-effective treatment modality for end stage kidney diseases. However, around 9% of the transplanted patients suffer from transplant failure and require re-transplantation. Antibody-mediated rejection (AMR) is one of the main causes of graft failure after kidney transplantation, therefore prevention and management of AMR is crucial in prolonging allograft survival. Donor-specific antibodies (DSA) play a pivotal part in AMR, however, the diagnosis of the presence of DSA requires donor's HLA information, which is lacking in the majority of kidney transplant patients who have received transplantations outside of Hong Kong. We employed a simple and non-invasive approach for determining donor HLA typing from recipients' urine samples to facilitate the correlation of DSA.

Methods: 700 urine samples were collected from patients who received kidney transplantations outside Hong Kong with unknown donor HLA information. PCR-sequence-specific primers (PCR-SSP) were used to deduce the donor mismatched HLA antigens. Due to the low resolution of the conventional PCR-SSP, the application of Next Generation Sequencing (NGS) to deduce donor mismatched HLA typing in high resolution was also investigated.

Results: Using PCR-SSP and NGS, the deduction success rate of donor mismatched HLA antigens was nearly 80.0%. Other than in the HLA-A, -B, and -DR loci, mismatched HLA typing was also deduced in the DQ loci. Anti-HLA IgG antibodies against HLA Class I and Class II antigens were detected in 27.9% of the patients. DSA was found in 11.1% of the patients, which was comparable to patients who received their transplantations in Hong Kong with known donor typing. With the results of DSA, 88.5% of AMR could be managed in patients with surviving allografts transplanted between 2013 and 2018. Allograft failure with histologic proven AMR was found in 11.5% of patients before the commencement of this study. This highlighted that the availability of donor HLA typing information is crucial for the early diagnosis of AMR, allowing prompt medical intervention to salvage graft failure.

Conclusion and/or Discussion: Recipients' urine samples have proven to be a valuable non-invasive source for deducing donor HLA typing with PCR-SSP and NGS. Deduction of donor mismatched HLA typing could enhance clinical management of post-transplant patients with unknown donor information.

Project Number: 13142121