

Congress Abstract

Monitoring of HLA Antibodies in Kidney Transplant Waitlist Patients Using Luminex Technology

Aida Askarovna Turganbekova¹, Saniya Alishevna Abdrakhmanova¹, Zhulduz Zhetpispayevna Zhanzakova¹

¹The Scientific and Production Center for Transfusiology, Astana, Kazakhstan

Proceedings of Central Asian Congress of Nephrologists with International Participation, October 9-10, Aktau, Kazakhstan

Corresponding author's email:
sharbanukanatkali@gmail.com

Copyright: by the author(s).

License: A non-exclusive license by the publisher. Published by Australasia Publishing Group LLP (Astana, Kazakhstan) on behalf Kazakh Kidney Foundation.

Open Access: This article is an open access article distributed under the terms and conditions of the CC-BY Creative Commons Attribution license
<https://creativecommons.org/licenses/by/4.0>



ABSTRACT

Background: Long-term graft survival in solid organ transplantation directly depends on the degree of human leukocyte antigen (HLA) compatibility between the donor and the recipient. Along with the cellular immune response, the humoral component—specifically, the presence of pre-existing circulating HLA antibodies—plays a critical role in the pathogenesis of both acute and chronic rejection. Monitoring the level of allosensitization in patients on the transplant waiting list is essential to mitigate the risk of post-transplant immunological complications.

Objective: To evaluate the structure and level of sensitization to HLA Class I and Class II antigens in potential kidney transplant recipients using high-sensitivity Luminex multiplex bead array technology.

Materials and Methods: A retrospective analysis of 1043 serum samples from patients on the kidney transplant waiting list for one year was performed. The mean age of the cohort was 53 years. HLA antibody screening was conducted via solid-phase bead-based immunoassay (Luminex technology) using commercial LabScreen Mixed (LSM12) detection kits (One Lambda, USA). The level of sensitization and antibody specificity were evaluated based on Mean Fluorescence Intensity (MFI).

Results: Screening revealed that 69.3% of the samples (n = 723) were negative for HLA antibodies. Reactive HLA antibodies (positive results) were verified in 30.7% of the patients (n = 320). Among the positive samples, isolated sensitization to HLA Class I antigens was detected in 143 recipients (44.7%), isolated sensitization to HLA Class II antigens in 36 recipients (11.2%), and combined sensitization to both classes (I and II) was identified in 113 cases (35.3%). The panel-reactive antibody (PRA) levels within the cohort ranged from 11% to 97%, with MFI values varying from 399.06 to 175,982.52.

Conclusion: Screening on the Luminex platform serves as a highly sensitive tool for pre-transplant monitoring. Assessing HLA status allows for the timely stratification of waitlist patients into specific immunological risk groups. Detecting high levels of allosensitization (MFI) justifies the need for tailored, selective donor matching, as well as the preemptive implementation of desensitization protocols including extracorporeal hemocorrection and targeted immunosuppressive therapy.

Keywords: Kidney; Transplantation; Waiting List; HLA Antibodies; Luminex Technology