

Correlations Between Blood Type and Human Leukocyte Antigen Production in Kidney and Bone Marrow Transplant Patients

Devon Pino, MS4 · Louise Helander, MBBS · Nicole L. Draper, MD

University of Colorado Anschutz Medical Campus, Aurora, Colorado, USA



Background

Human Leukocyte Antigen (HLA) antibodies are produced by the immune system when exposed to allogeneic tissue, typically through pregnancy, transfusion, or transplant. Relationships have been established between multiple exposures and greater HLA antibody production, but other factors which may predispose an individual to greater HLA antibody production, such as blood type, have yet to be explored.

Materials and Methods

We analyzed the blood types and calculated panel reactive antibody (cPRA) values of patients in bone marrow transplant (BMT) and kidney transplant populations. Blood type frequencies were compared by chi-squared testing, and the cPRA values of the kidney transplant and BMT groups were compared by t-testing.

Results

In the kidney transplant population, a lower percentage of blood type A and a higher percentage of blood type AB was seen in patients who had cPRA values of 30 or more. A decreased percentage of blood type A was also seen in patients who had a positive cPRA. In the BMT population, a lower percentage of blood type O was seen in patients who had a positive cPRA.

Conclusion

Blood type A is less common in kidney transplant patients with higher cPRA values, while blood type AB is more common. Although it is not clear why this relationship was not also seen in the BMT population, this could be due to differences in antigen exposure.

Utilizing Routine Tests of Kidney Transplant Candidates to Improve Patient Safety and Delivery of HLA-Matched Platelets

Devon Pino, MS4 · Louise Helander, MBBS · Nicole L. Draper, MD

University of Colorado Anschutz Medical Campus, Aurora, Colorado, USA



Introduction

Human leukocyte antigen (HLA) antibody testing is routinely performed on patients prior to transplant. At our institution, patients with a Calculated Panel Reactive Antibody (CPRA) of 30% or more are identified as candidates for HLA-matched platelets, usually in the context of hematologic malignancy. However, patients receiving PRA testing for kidney transplants through our partner institution were not being identified as candidates for HLA-matched platelets. Since the clinical identification of platelet refractoriness typically requires several days to complete testing and receive HLA-matched platelets, it is in the patient's best interest to be provided properly matched platelets as quickly as possible.

Materials and Methods

We conducted a database query of all kidney transplant candidates who received PRA testing over 5 years (2015-2020). All patients with a maximum CPRA of 30% or more were relayed to our institution's blood bank and a "special need" for HLA-matched platelets was added to their record in the laboratory computer system.

Results

Out of 5694 patients on the kidney transplant list, we identified 1256 (22%) patients who had a clinically significant CPRA of 30% or more in the last 5 years. Of these, 467 (8%) patients had a CPRA value of 90% or more. All patients with clinically significant HLA antibodies had a need for HLA-matched platelets entered in the blood bank's laboratory computer system. 68 of the 1256 patients had no history of class 1 HLA antibodies and these patients were excluded.

Conclusion

It is useful for blood banks/transfusion services to have access to records of all patients with HLA antibodies to ensure that those patients receive timely, effective treatment with HLA-matched platelets if and when they are needed. We will develop a system to track these prospectively in the future.