

Association of HLA-G Allele Distribution with Rejection in Heart Transplant Patients

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Abstract

Objective: HLA-G is a non-classical human leukocyte antigen (HLA) class-I molecule that regulates immune tolerance and plays a key role in transplantation immunology. Solid organ transplantation is a life-saving option for patients with end-stage organ failure. Despite advances in immunosuppressive therapy, allograft rejection remains a major complication. Identifying immunogenetic factors associated with rejection may improve post-transplant monitoring and long-term graft survival. The aim of the study was to investigate the relationship between HLA-G alleles and rejection in heart transplantation.

Materials and Methods: This study included 31 patients who underwent heart transplantation between 2007 and 2024 at Başkent University Ankara Hospital. Patients were tested Luminex Single Antigen (LSA) assay, and an MFI value ≥ 1000 for donor-specific antibodies (DSAs) was considered positive. Endomyocardial biopsies were evaluated for antibody-mediated rejection (AMR). Rejection was detected in 13 patients.

HLA-G typing was performed using Sanger-based sequencing by using SBTexcellerator HLA-G Core Kit (GenDx, Netherlands) at Baskent University Adana Dr.Turgut Noyan Medical Center. Genomic DNA was extracted from peripheral blood using the EZ1 DNA Blood Kit (QIAGEN, Germany).

This study was approved by Baskent University Institutional Review Board and Ethics Committee (Project no: KA25/36) and supported by Baskent University Research Fund.

Results: Results are given in Figure 1. According to study, HLA-G*01:01:01 is the most common allele and the highest genotype frequency in both the rejection and non-rejection groups belonged to G*01:01:01/*01:01:01, observed at rates of 30.77% versus 22.22%, respectively. HLA-G*01:01/*01:01 homozygosity was exclusively detected in the non-rejection group, with a frequency of 16.66%.

Conclusion: Although the number of patients in the study was limited, the HLA-G allele is thought to play a role in the rejection mechanism. The presence of homozygous HLA-G*01:01 was detected only in the non-rejection group and is thought to be effective in protecting against rejection.

Keywords: HLA-G, heart transplantation, rejection

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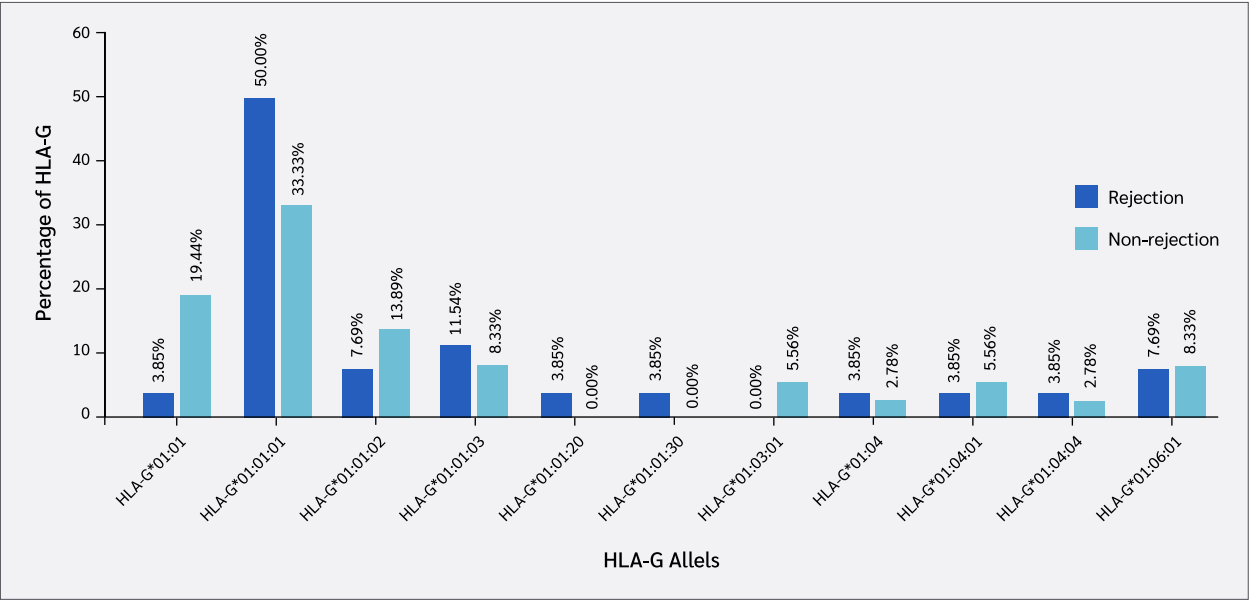


Figure 1. HLA-G allelic profile of heart transplant patients.