DISTRIBUTION OF HLA CLASS I AND II ALLELES IN KAZAKH PATIENTS WITH CHRONIC MYELOID LEUKEMIA

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Introduction: Associations between HLA (Human Leukocyte Antigens) alleles and the development of chronic myeloid leukemia (CML) have never been studied in Kazakhstan. The aim of the study was to determine the rate of frequency of HLA class I and class II alleles in Kazakh chronic myeloid leukemia (CML) patients.

Methods: The study was conducted on the blood samples of 3,657 Kazakh participants at the Scientific-Production Center of Transfusiology, Astana, Kazakhstan. The participants were consisted of two groups. In the main group, there were 47 patients with CML (23 males and 24 females) with average age 47 years (11-69 yrs). In the control group, there were 3,621 healthy blood donors (2,136 males and 1,485 females) with average age 41 years (18-64 yrs). The HLA typing method consisted of three stages: DNA isolation, amplification, detection. From whole blood, genomic DNA was isolated by a proteinase method. HLA-typing (HLA-A, -B, Cw, -DRB1 and -DQB1) for both groups was conducted by low-resolution Polymerase Chain Reaction (PCR).

Results: The current study shows that HLA-B*41 (OR=5.39; 95% CI= 2.08 - 13.99; $p<0.01$), *47 (OR=8.69; 95% CI= 1.08 - 70.01; $p<0.01$), *73 (OR=6.51; 95% CI= 0.83 - 51.13; $p<0.05$), HLA-DRB1*09 (OR=2.38, 95% CI=1.00-5.68, $p<0.05$) alleles positively associated with CML. On the other hand, HLA-A*01 (OR=0.28; 95% CI= 0.09 - 0.91; $p<0.05$), HLA-C*02 (OR=0.13; 95% CI= 0.02 - 0.95; $p<0.05$), *06 (OR=0.42; 95% CI= 0.18 - 0.98; $p<0.05$), DRB1*12 (OR=0; 95% CI= 0; $p<0.05$) alleles negatively associated with CML development.

Conclusions: Four alleles at the HLA-B and HLA-DRB1* loci appear to be linked with CML development and four alleles at the HLA-A, HLA-C and HLA-DRB1 appear to be associated with CML protection within the Kazakh population. Additionally, this study adds useful information to study a variety of diseases associated with HLA antigens including CML and other oncohematological disorders.