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SHORT REPORT

Association between human leukocyte antigens and cutaneous adverse drug reactions to antiepileptics and antibiotics in the Iranian population

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Abstract

In this case–control study, class I and II human leukocyte antigen (HLA) alleles in Iranian patients with benign and severe cutaneous adverse drug reactions (CADRs) due to aromatic anticonvulsants and antibiotics were evaluated. Patients diagnosed with CADRs (based on clinical and laboratory findings) with a Naranjo score of ≥ 4 underwent blood sampling and HLA-DNA typing. The control group comprised 90 healthy Iranian adults. Alleles with a frequency of more than two were reported. Deviations from Hardy–Weinberg equilibrium were not observed. Eighty patients with CADRs including 54 females and 26 males with a mean age of 41.49 ± 16.08 years were enrolled in this study. The culprit drugs included anticonvulsants (lamotrigine, carbamazepine, and phenytoin) and antibiotics (ciprofloxacin and co-trimoxazole). The comparison of allele frequencies in the Iranian healthy control group and the group with benign CADRs revealed that *HLA-Cw*04*, and *HLA-A*24* were significantly associated with lamotrigine-induced maculopapular CADRs. Furthermore, *HLA-B*51* showed a significant correlation with carbamazepine-induced maculopapular CADRs. Significant associations were also detected between ciprofloxacin-induced urticarial CADRs with *HLA-B*40*, and *HLA-DRB1*14*. In the severe group, *HLA-B*38* and *HLA-DRB1*13* were significantly associated with lamotrigine-induced Stevens-Johnson syndrome/toxic epidermal necrolysis (SJS/TEN). Moreover, *HLA-A*31* and *HLA-Cw*04* were significantly correlated with carbamazepine-induced drug reactions with eosinophilia and systemic

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induced MPE was significantly correlated with *HLA-Cw*04*, and *HLA-A*24*. Similarly, lamotrigine-induced SJS/TEN was significantly associated with *HLA-B*38* and *HLA-DRB1*13*. Additionally, *HLA-A*31* was associated with DRESS caused by carbamazepine. The most frequent CADR-inducing drugs were anticonvulsants.

Open Research

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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