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Association of the CD14 C159T and the Toll-like receptor 4 Asp299Gly polymorphisms with various phenotypes of asthma in adults from Crimea

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Abstract

Background: This study assessed gene polymorphisms of the CD14 receptor (C-159T) and Toll-like receptor 4 (Asp299Gly) in a patient population in Crimea, Ukraine, stratified by clinical (early versus late onset; frequent versus occasional relapses; fixed versus reversible obstruction) and immunologic (atopic versus nonatopic; eosinophilic; neutrophilic or paucigranulocytic inflammation) subtype. **Methods:** Two polymorphisms, CD14 C-159T and TLR4 Asp299Gly, were assessed in 331 patients with asthma. The control group included 285 volunteers who were nonatopic. The single nucleotide polymorphisms were studied by using polymerase chain reaction with electrophoretic detection. **Results:** There were increased odds of asthma development in patients with the Asp299Gly TLR4 mutation compared with the general population underdominant odds ratio (OR) 1.52 [95% confidence interval (CI), 1.00-2.32] and overdominant (OR 1.55 [95% CI, 1.01-2.38]) models after adjustment for gender and age. In addition, mutations in this gene decreased the odds of nonatopic asthma in underdominant (OR 0.26 [95% CI, 0.07-0.93]; $p = 0.027$), overdominant (OR 0.27 [95% CI, 0.07-0.96]; $p = 0.033$), and log-additive models (OR 0.26 [95% CI, 0.07-0.93]; $p = 0.026$) compared with the atopic subgroup after adjustment for gender, age, number of exacerbations, and type of airway inflammation. Allele frequencies for CD14 and TLR4 polymorphisms did not show statistical differences between the patients with asthma and the control subjects. **Conclusion:** CD14 C-159T polymorphisms were not associated with asthma in the adult population in Crimea. TLR4 Asp299Gly polymorphisms were associated with asthma and with decreased odds of nonatopic asthma compared with atopic asthma in the adult population in Crimea.

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