Evidence for HLA-DQA1 Locus Being Associated With Abdominal Aortic Aneurysms in the Belgian Population

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Background: Chronic inflammation and autoimmunity have been proposed to contribute to the pathogenesis of abdominal aortic aneurysms (AAAs). AAAs are considered a complex disease with both genetic and environmental risk factors. Previous studies suggested that some HLA alleles are associated with AAA, however, the sample sizes of these studies were relatively small and the results of these studies were not unified. The aim of this study was to establish a possible role for autoimmunity in the etiology of AAA by investigating whether HLA-DQA1, -DQB1, -DRB1 or -DRB3–5 are associated with AAA. **Design and Subjects**: HLA-DQA1, -DQB1, -DRB1 and -DRB3–5 alleles were determined in 387 AAA cases (180 Belgian and 207 Canadian) and 426 control subjects (269 Belgian and 157 Canadian) by PCR and single-strand oligonucleotide probe hybridization using 14 probes for HLA-DQA1 alleles, 25 probes for -DQB1 alleles and 40 probes for -DRB1 and -DRB3–5 alleles. Asymptotic p-values were obtained using the chi-square test for association between marker alleles and disease status. Because of the large number of alleles at each locus, we also obtained empirical p-values for the test of association using a permutation test as implemented in the computer program CLUMP. Such variables as gender, ethnicity, family history of AAA, and status of the AAA (ruptured, operated prior to rupture or diagnosed by ultrasonography but not operated) were taken into account in the analysis. **Result**: Overall, we observed an association with the HLA-DQA1 locus among the Belgian population. In particular, there was a significant difference in the frequency of the HLA-DQA1*0102 allele between patients with AAA (75/360, 20.8%) and controls (71/538, 13.2%) in the Belgians (*Empirical P*_0.039, *Asymptotic P*_0.049). No significant associations, however, were found in the Canadian population. **Conclusions**: This study showed evidence that the HLA-DQA1 locus harbors a genetic risk factor for the development of AAAs in the Belgian population. These findings suggest the contribution of autoimmunity in the pathogenesis of AAAs. This study also showed ethnic variation of HLA genetic polymorphisms.