CCR5 polymorphisms in ocular toxoplasmosis

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Abstract

C-C chemokine receptor type 5 (CCR5) is a chemokine receptor that influences the immune response to infectious and parasitic diseases. This study aimed to determine whether the *CCR5*Δ32 and *CCR5* 59029 A/G polymorphisms are associated with the development of ocular toxoplasmosis in humans. Patients with positive serology for *Toxoplasma gondii* were analyzed and grouped as "with ocular toxoplasmosis" (G1: n = 160) or "without ocular toxoplasmosis" (G2: n = 160). A control group (G3) consisted of 160 individuals with negative serology. The characterization of the *CCR5*Δ32 and *CCR5* 59029 A/G polymorphisms was by PCR and by PCR-RFLP, respectively. The difference between groups in respect to the mean age was statistically significant (G1 vs.G2: p-value <0.0001, t = 7.21; GL = 318; G1 vs.G3: p-value <0.0001, t = 4.32; GL = 318; G2 vs. G3: p-value <0.0001, t = 9.62; GL = 318). In all groups, the distribution of the genotypes of the CCR5Δ32 polymorphism and CCR5 59029 A/G polymorphism were in Hardy-Weinberg equilibrium (p-value ≥ 0.05). No statistical difference was found both for alleles and for genotypes of the *CCR5* gene (homozygotes and heterozygotes) between individuals with ocular toxoplasmosis and the controls. Higher frequencies of the *CCR5*/*CCR5*Δ32 genotype (p-value = 0.007; RR = 4.00; 95% CI: 1.39-11.44) and *CCR5*Δ32 allele (p-value = 0.009; RR = 4.00; 95% CI: 1.36-11.70) and a lower frequency of the *CCR5*/*CCR5* genotype (p-value = 0.007; RR = 0.84; 95% CI: 0.74-0.95) and *CCR5* allele (p-value = 0.009; RR = 0.92; 95% CI: 0.87-0.97) were found in male patients who developed ocular toxoplasmosis. Data from this study show that the *CCR5*Δ32 allele of the *CCR5* gene may be an immunogenetic risk factor for ocular toxoplasmosis in male but not in female subjects.

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