The Impact of Vitamin D Receptor Gene Polymorphisms and Haplotypes on the susceptibility to Toxoplasmosis

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Abstract

Background: Toxoplasmosis is a cosmopolitan infectious disease caused by *Toxoplasma gondii*. Vitamin D is an immune modulator exerting its effect through a nuclear receptor called vitamin D receptor. Genetic polymorphisms in the vitamin D receptor gene could affect the activity of vitamin D and hence the individual's susceptibility to toxoplasmosis.

Objective: To evaluate the impact of four single nucleotide polymorphisms (FokI, BsmI, TaqI and ApaI) and different haplotypes of vitamin D receptor gene on the susceptibility of Iraqi women to toxoplasmosis.

Patients and Methods: This case-control study involved 72 women with confirmed toxoplasmosis and 50 women as controls, DNA was extracted from blood samples and allele specific polymerase chain reaction technique was used for genotyping of the four polymorphisms using specific primers. Haplotypes and linkage disequilibrium were calculated using single nucleotide polymorphism analyzer 2.0 software.

Results: Only the FokIpolymorphism had significant reverse association with toxoplasmosis in homozygote form (OR=0.140, 95%CI= 0.027-0.717, P=0.018). At allelic level, FokI F allele had significantly higher frequency in patients than controls (OR= 0.552, 95%CI=0.314-0.972, P=0.043).The frequency of two haplotypes differed significantly between patients and controls where FBAT haplotype was more frequent in patients while fta B was more frequent in controls. Moderate linkage disequilibrium correlations were found between FokI and TaqI in patients and controls.

Conclusion: Allele f of FokI polymorphism and fBat haplotype in vitamin receptor gene is associated with a protective role against toxoplasmosis.

Key words: Toxoplasmosis, Vitamin D receptor gene polymorphisms, Haplotypes, Linkage disequilibrium

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