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Determination of the CCR5Δ32 Frequency in Emiratis and Tunisians and Screening of the CCR5 Gene for Novel Alleles in Emiratis

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Abstract : Background: The chemokine receptor components play crucial roles in the immune system and some of them serve as co-receptors for the HIV virus. Several studies have documented those variants in chemokine receptors are correlated with susceptibility and resistance to infection with HIV virus. For example, mutations in the chemokine receptor 5 gene (CCR5) resulting in loss-of-function (such as the homozygous CCR5Δ32) confer high degree of resistance to HIV infection. Heterozygotes for these variants exhibit slow progression to AIDS. The prevalence of CCR5 polymorphisms varies among ethnic and geographical groups. For example, the CCR5 Δ32 variant is present in 10–15% of north Europeans but is rarely encountered among Africans. This study aims to identify the prevalence of some CCR5 variants in two geographically distant Arab populations (namely Emiratis and Tunisians). Methodology: The prevalence of CCR5 gene variants including CCR5Δ32, FS299, C101X, A29S and C178R has been determined using PCR and direct DNA sequencing. A total of 403 unrelated healthy individuals (253 Emiratis and 150 Tunisians) were genotyped for the CCR5Δ32 variant using PCR amplification and gel electrophoresis. In addition, 200 Emiratis have been screened for other SNPs using Sanger DNA sequencing. Results: Among Emiratis, the allele frequency of the CCR5Δ32 variant has been found to be 0.002. In addition, two variants L55Q and A159 were found at a frequency of 0.002.Moreover, the prevalence of the CCR5Δ32 variant in Tunisians was estimated to be 0.013 which is relatively higher than its frequency in Emiratis but lower than Europeans. Conclusion: We conclude that the allele frequency of the most critical CCR5 polymorphism (Δ32) is extremely low among Emiratis compared to other Arabs and North Europeans. In addition, very low allele frequencies of other CCR5 polymorphisms have been detected among Emiratis.

Keywords : chemokine receptors, CCR5Δ32, CCR5 polymorphisms, Emiratis, Arab populations
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