Vitamin D receptor gene polymorphisms and its association with this vitamin level in susceptibility to tuberculosis

Abstract

Background: It is estimated that one third of the world population were infected by *M. tuberculosis* but due to differences in their immune system activity against the invasive microorganisms, only in10% of them the disease is developed. Vitamin D metabolism and proper activities of its receptor (VDR) are important factors in host innate immune system against the tuberculosis. In the present study polymorphisms of *Taq*I, *Bsm*I, *Fok*I and *Apa*I in VDR gene and their relationship with vitamin D levels in susceptibility to tuberculosis have been investigated.

Material and methods: This study was performed on 84 patients with tuberculosis (50 male and 34 female) and 90 healthy controls (49 male and 41 female). Vitamin D levels were measured from the plasma of all groups by ELISA method. Also DNA was isolated from the blood leukocytes of them and amplified by PCR technique. Then RFLP was performed on each PCR products to study the *Taq*I, *Bsm*I, *Fok*I and *Apa*I polymorphisms. Finally, the statistical analysis conducted by Chi-Square and T Tests.

Results: In the present study, analysis showed no statistically significant association between *Taq*I, *Bsm*I, *Fok*I and *Apa*I polymorphisms and active form of disease. However we found close correlation between vitamin D deficiency and active tuberculosis (P = 0.059). Significant association was found between the *Fok*I-ff gene polymorphism and vitamin D levels in both groups (P = 0.045).

Conclusions: In this study, there was no relationship between genotype frequencies and susceptibility to tuberculosis. But whenever this assessment conjugated with measurement of circulating vitamin D, significantly association was found, as *Fok*I-ff genotype individuals (with normal levels of vitamin D) maybe are protected against active tuberculosis.

Key Words: Tuberculosis, Receptors, Polymorphism, vitamin D.