Allelic Discrimination of Vitamin D Receptor Polymorphisms and Risk of Type 2 Diabetes Mellitus

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Background:

Type 2 diabetes mellitus (T2DM) is one of the rapidly growing healthcare problems, and several vitamin D receptor (VDR) polymorphisms seem to modulate the risk of T2DM. Our research was designed to investigate the allelic discrimination of VDR polymorphisms and T2DM occurrence risk.

Methods:

This case-control research included 156 patients with T2DM and 145 healthy control subjects. Most of the study population were males 56.6% vs. 62.8% in the case and control groups, respectively. Genotyping for VDR single nucleotide polymorphisms (SNPs), rs228570 (Fok1), rs7975232 (Apa1), and rs1544410 (Bsm1) was compared between both groups.

Results:

There was a negative link between vitamin D levels and insulin sensitivity. A significant difference was noted in the allelic discrimination of VDR polymorphism rs228570 and rs1544410 between the study groups ($p < 0.001$). No difference was observed in the allelic discrimination of VDR polymorphism rs7975232 between the groups ($p = 0.063$). Moreover, T2DM patients had significantly higher levels of fasting blood sugar (FBS), glycated hemoglobin HbA1c, 2-h post-prandial blood sugar (PP), serum glutamic oxaloacetic transaminase (SGOT), serum glutamic-pyruvic transaminase (SGPT), total cholesterol, and triglycerides ($p < 0.001$), while High-Density Lipoprotein (HDL) Cholesterol (HDL-C) was significantly decreased ($p = 0.006$).

Conclusions:

VDR polymorphisms had a positive association with T2DM risk among the Egyptian population. Further large-scale research using deep sequencing of samples is strongly urged to investigate different vitamin D gene variants and interactions, as well as the influence of vitamin D on T2DM.

Keywords:
vitamin D receptor, polymorphism, allelic discrimination, T2DM