Transcription Factor 7-Like-2 (TCF7L2) rs7903146 (C/T) Polymorphism in Patients with Type 2 Diabetes Mellitus

Ahmed Mohamed Bahaa Eldin[1], Arig Aly Seif[2], Amira Ibrahim Elsayed[2], Walaa Ahmed Yousry Kabeil[2]

ABSTRACT

BACKGROUND:

Type 2 diabetes mellitus (T2DM) is a metabolic disorder characterized by the incapability of pancreas to increase insulin secretion to compensate for insulin resistance in the peripheral tissues. T2DM is a multifactorial disease including several environmental factors with the presence of genetic predisposition. The transcription factor 7-like-2 gene (TCF7L2) rs7903146 (C/T) polymorphism is one of the most susceptible genes to T2DM discovered to date, with contribution to the disease through the Wnt/β-catenin signaling pathway affecting pancreatic islet development, expression of several genes involved in insulin granules exocytosis, and the incretin glucagon-like peptide 1 (GLP-1) gene. Then, TCF7L2 gene seems to affect diabetes susceptibility through B-cell dysfunction that is why we studied its association with T2DM in particular.

OBJECTIVES:

To investigate the potential association of the transcription factor 7-like-2 (TCF7L2) rs7903146 (C/T) gene polymorphism in patients with T2DM. Methods: A case-control study conducted on 70 T2DM patients recruited from the endocrinology clinic at Ain Shams University Hospitals, and 30 non-diabetic healthy controls age- and sex-matched with the patients. All subjects underwent full history taking; thorough clinical examination; routine laboratory investigations including hemoglobin A1c, total cholesterol, triglycerides, high-density lipoprotein-cholesterol, and low-density lipoprotein- cholesterol; and determination of TCF7L2 gene polymorphism by qRT-PCR.

RESULTS:

The minor T allele of the rs7903146(C/T) SNP was associated with high risk of development of T2DM with an OR of 1.35 (95% CI: 0.68–2.6) and the heterozygous genotype (CT) with an OR 1.16 (95% CI: 0.49–2.7); however, they were statistically insignificant (p value >0.05).

CONCLUSION:

Our study did not confirm the presence of significant association between the TCF7L2 rs7903146(C/T) polymorphism and T2DM; however, it pointed out the possibility of presence of high risk of development of T2DM in patients with TT genotype. Further studies with higher sample size are needed to clarify the association

KEYWORDS:

Type 2 diabetes mellitus · Transcription factor 7-like-2 · rs7903146 polymorphism

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1- *Internal Medicine and Endocrinology, Faculty of Medicine, Ain-Shams University, Cairo, Egypt*

2- *Clinical Pathology, Faculty of Medicine, Ain Shams University, Cairo, Egypt.*