

Transcription Factor 7-Like 2 genetic polymorphisms are associated with prediabetes in young Bangladeshi people

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Abstract

Background: Prediabetes is an increasing global health concern, including in Bangladesh. Although TCF7L2 polymorphisms are well recognized in relation to dysglycaemia and type 2 diabetes, their role in prediabetes among young individuals remains unclear.

Objective: To evaluate the association of TCF7L2 polymorphisms rs12255372, rs7901695, rs7903146 and rs11196205 with prediabetes in young Bangladeshi individuals.

Methods: This case-control study included individuals aged 10 to <35 years attending the Study of Diabetes in Young (SODY) clinic, Department of Endocrinology, Bangladesh Medical University, from 2022 to 2024. A total of 436 participants were enrolled, including 218 with prediabetes and 218 with normal glucose tolerance (NGT). Glycaemic status was determined by oral glucose tolerance testing, while TCF7L2 polymorphisms were identified using Sanger sequencing. Genotype and allele frequencies, Hardy-Weinberg equilibrium (HWE), linkage disequilibrium (LD), haplotypes and genetic models were assessed.

Results: Heterozygous genotypes of rs7903146 ($p=0.024$) and rs7901695 ($p=0.03$) were significantly associated with prediabetes, while rs12255372 showed borderline significance and rs11196205 showed no significant association. Significant associations were also observed under the over-dominant model for rs12255372, rs7903146 and rs7901695, and logistic regression adjusted for LDL in four separate models identified these variants as independent predictors, with adjusted ORs of 1.62 (95% CI: 1.06-2.47; $p=0.025$), 1.78 (95% CI: 1.18-2.68; $p=0.006$), and 1.70 (95% CI: 1.12-2.57; $p=0.012$), respectively. Allele frequencies and haplotype analyses were not significant despite strong LD among the four SNPs. HWE was maintained for rs12255372 and rs11196205 in both groups, whereas rs7903146 and rs7901695 were deviated from equilibrium in the prediabetes group only ($p=0.03$ and $p=0.011$, respectively).

Conclusion: TCF7L2 polymorphisms, particularly rs7903146 and rs7901695, were observed to be significantly associated with prediabetes in young Bangladeshi individuals. [*J Assoc Clin Endocrinol Diabetol Bangladesh, 2026;5(Suppl 1): S45*]

Keywords: Prediabetes, TCF7L2, Polymorphism, Young population, Bangladesh

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