

TRANSCRIPTION FACTOR 7-LIKE 2 GENETIC POLYMORPHISM IN YOUNG BANGLADESHI PEOPLE WITH PREDIABETES

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Background: Prediabetes is increasing globally, including in Bangladesh. Polymorphisms in the TCF7L2 gene are associated with dysglycemia, but their role in young individuals remains unclear. **Methods:** This case-control study included 436 participants aged 10–34 years (218 prediabetes and 218 normal glucose tolerance) recruited from the Young-diabetes clinic, Department of Endocrinology, Bangladesh Medical University (BMU) (2022–2024). Participants were screened by OGTT, and baseline data were recorded. DNA was extracted from blood samples, and SNP genotyping was performed using Sanger sequencing. Genotype and allele frequencies, Hardy–Weinberg equilibrium, linkage disequilibrium, and genetic models were analyzed. **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 was not significant. Significant associations were observed in the over-dominant model for rs12255372, rs7903146, and rs7901695. Logistic regression confirmed these as independent predictors. Allele and haplotype analyses were not significant, despite strong linkage disequilibrium. Hardy–Weinberg equilibrium was maintained for rs12255372 and rs11196205 in both groups, whereas rs7903146 and rs7901695 deviated from equilibrium in the prediabetes group only ($p=0.03$ and $p=0.011$, respectively). Impaired fasting glucose was the most common subtype of prediabetes (58.3%). The prediabetes group was younger and had a higher proportion of adolescents. Central obesity ($p<0.05$) and low physical activity ($p<0.001$) were more frequent in the NGT group, while triglyceride levels were higher in prediabetes ($p=0.013$). **Conclusion:** TCF7L2 polymorphisms (particularly rs7903146 and rs7901695) show modest association with prediabetes in young individuals of Bangladesh.

Keywords: prediabetes, TCF7L2, polymorphism, young population, Bangladesh

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