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Association between the rs4753426 polymorphism in *MTNR1B* with fasting plasma glucose level and pancreatic β-cell function in gestational diabetes mellitus

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ABSTRACT. We investigated the association between rs4753426 single nucleotide polymorphisms in the melatonin receptor 1B (*MTNR1B*) gene and the risk of developing gestational diabetes mellitus (GDM). A total of 516 gravidas (186 with GDM and 330 non-diabetic controls) were enrolled in the study. Genotype and allele frequencies of rs4753426 in the *MTNR1B* gene were detected by DNA sequencing. Fasting plasma glucose and fasting insulin levels were measured to calculate the homeostasis model assessment for insulin resistance (HOMA-IR) and for β-cell function. Three genotypes (CC, CT, and TT) were found in both groups. The frequencies of CC, CT, and TT genotypes for the GDM group were 70.97, 22.58, and 6.45% *vs* 53.03, 39.70, and 7.27% in the control group, respectively. Significant differences were observed in genotype frequencies between groups ($P < 0.05$). T and C allele frequencies in the GDM group were 17.74 and 82.26%, respectively, and in the control group were 27.12 and 72.88%, respectively. Significant differences in T and C allele frequencies

were found between groups ($P < 0.05$). In the GDM group, the C allele was associated with increased fasting plasma glucose level and reduced pancreatic β-cell function ($P < 0.05$). There were no significant differences in total cholesterol, triglyceride, low-density lipoprotein, high-density lipoprotein concentration, or HOMA-IR between groups ($P > 0.05$). The single nucleotide polymorphism rs4753426 in *MTNR1B* may be a susceptibility gene locus for GDM, and the C allele may contribute to the increased fasting plasma glucose level and reduced pancreatic β-cell function.

Key words: Diabetes mellitus; Genetic susceptibility; Pregnancy; Melatonin receptor; MT2; Single nucleotide polymorphisms

