Meta-analysis of association between TCF7L2 rs7903146 and risk of new-onset diabetes after transplantation

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Background: Single nucleotide polymorphisms may influence the risk of development of new-onset diabetes after transplantation (NODAT), a post-transplant clinical complication that is often implicated in allograft rejection and mortality. We performed a meta-analysis of association between TCF7L2 rs7903146 and risk of post-transplant diabetes mellitus.

Methods: A systematic search was conducted using PubMed and ScienceDirect electronic databases for studies published between January 2001 to January 2021. Case-control or cohort studies reporting association between NODAT (diagnosis based on American Diabetes Association criteria) and TCF7L2 rs7903146 were included. MetaGenyo was used for meta-analysis (random effects model). Pooled odds ratios with 95% confidence intervals were reported to evaluate the strengths of association.

Results: Two reviewers independently screened for articles. A total of six case-control studies were included for full-text review and quantitative analysis after screening for eligibility. Genotypic distributions were in Hardy-Weinberg equilibrium for included studies. All papers reported statistically significant association of TCF7L2 rs7903146 for risk of NODAT, except for one study. There was moderate heterogeneity among studies ($I^2=60.6\%$). Pooled analysis revealed 51% odds of developing NODAT with TCF7L2 rs7903146 T allele (allele contrast model: odds ratio, 1.51; 95% confidence interval, 1.13–2.02; adjusted $P=0.03$).

Conclusions: The present meta-analysis demonstrated association between TCF7L2 variant rs7903146 and risk of developing NODAT. This finding may have clinical implications for individuals undergoing kidney transplantation.

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