An updated meta-analysis of methylenetetrahydrofolate reductase gene 677C/T polymorphism with diabetic nephropathy and diabetic retinopathy.

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OBJECTIVE: Studies investigating the association of methylenetetrahydrofolate reductase (MTHFR) gene 677C/T polymorphism with diabetic nephropathy and diabetic retinopathy have so far reported inconclusive results. We therefore aim to address this inconclusiveness by conducting a meta-analysis.

METHODS: Random-effects model was applied irrespective of between-study heterogeneity. Data and study quality were assessed in duplicate. A total of 7807 and 1599 subjects from 21 and 8 studies were analyzed for diabetic nephropathy and diabetic retinopathy, respectively.

RESULTS: Carriers of 677TT genotype were 1.71 (95% confidence interval [95% CI]: 1.02-2.88; P=0.042) and 2.89 (95% CI: 1.51-5.53; P=0.001) times more likely to develop diabetic nephropathy separately relative to diabetic patients without nephropathy and nondiabetic controls. Likewise, this association was preserved for diabetic patients with retinopathy referring to those without (odds ratio [OR]=1.86; 95% CI: 1.21-2.86; P=0.004). Subgroup analyses showed that ethnicity was a possible confounder, especially in West Asians and Africans, and so were gender and duration of diabetes mellitus in diabetic nephropathy studies. Probability of publication bias was low across all comparisons as reflected by the funnel plot and corresponding test.

CONCLUSION: Taken together, our results demonstrate that MTHFR gene 677TT genotype might confer a moderately augmented risk for diabetic nephropathy and diabetic retinopathy.

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