Ectonucleotide Pyrophosphatase/Phosphodiesterase 1 (K121Q Rs1044498) Polymorphism Is Associated with Diabetic Nephropathy but Not Obesity Among Type-2 Diabetes Mellitus - Egyptian Patients

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Introduction:

Genetics contribute to the development of type-2 diabetes mellitus (T2DM), its complications, and phenotypes such as diabetic nephropathy (DN) and obesity. Although the likely associations among the ectonucleotide pyrophosphatase/phosphodiesterase 1 (ENPP1) gene, DN and obesity have been massively investigated, the results are still controversial. This study aimed to assess whether ENPP1 K121Q (A/C rs1044498) variant is associated with DN and obesity in T2DM Egyptian patients. We genotyped this variant in a total of 183 T2DM Egyptian patients who were classified into cases (91 participants with moderately increased albuminuria or severely increased albuminuria ≥ 30 mg/g) and controls (92 patients with normoalbuminuria <30 mg/g) using TaqMan technology.

Results:

Patients, with the C (minor/risk) allele, had significantly higher moderately increased albuminuria/severely increased albuminuria levels (P < 0.001) and albumin-to-creatinine ratio (P = 0.001) than those with the wild A allele. AC and CC genotypes of ENPP1 K121Q (A/C, rs1044498) variant and its C-allele frequencies are significantly higher in cases than controls (P = 0.043 and 0.013), respectively, and in patients with estimated glomerular-filtration rate (eGFR) less than 60 than those with eGFR more than 60 (P = 0.014 and 0.004), respectively.

AC and CC genotypes are associated with cases with a significant odds ratio in both dominant [odds ratio (OR): 2.003, 95% confidence interval (CI): 1.106–3.628, P = 0.022) and additive (OR: 1.865, 95% CI: 1.134–3.070, P = 0.014) models of inheritance and in patients with eGFR less than 60 in the dominant model of inheritance (OR: 2.398, 95% CI: 1.258–4.571, P = 0.008), but showed no association with obesity (P > 0.05).

Conclusion:

ENPP1 K121Q (A/C, rs1044498) variant is associated with DN but not obesity among Egyptian T2DM patients.