

Possible role of microsomal epoxide hydrolase gene polymorphism as a risk factor for developing insulin resistance and type 2 diabetes mellitus.

Ghattas MH, Amer MA.

Source

Department of Medical Biochemistry, Faculty of Medicine, Suez Canal University, Ismailia, Egypt, m_gattas@hotmail.com.

Abstract

The purpose of this study was to investigate the effects of mEPHX1 polymorphisms on risk of type 2 diabetes mellitus (T2DM) and insulin resistance (IR). One hundred and twelve patients with the diagnosis of T2DM and 150 control subjects were enrolled in the study. We investigated the two polymorphisms of the mEPHX1 gene (exon 3 Tyr113His and exon 4 His139Arg) using PCR-RFLP. Among diabetics, the frequencies obtained for the exon 3 mEPHX1 Tyr113 and His113 alleles were 46.9 and 53.1 %, respectively. In the control group, the frequencies were 70.7 and 29.3 %, respectively ($P = 0.0001$, $OR = 2.73$, $95 \% CI = 1.9-3.91$). The prevalence of mEPHX1 exon 3 Tyr/His and His/His was statistically significant ($P = 0.004$; 0.0001 , respectively) when compared with the mEPHX1 exon 3 Tyr/Tyr homozygous carriers in both T2DM patients and in controls. We found that the His113 allele carriers had higher fasting insulin level, HOMA-IR, β cell activity, and lower insulin sensitivity compared to the wild type ($P = 0.0001$, 0.029 , 0.0001 , and 0.001 , respectively). In contrast, there was no significant difference in exon 4 polymorphisms between patients and controls. However, our data revealed that the His139/His139 genotype carriers had higher fasting insulin level, and lower insulin sensitivity compared to Arg139 allele carriers ($P = 0.02$, and 0.001 , respectively). Our study has shown for the first time that minor Tyr113 allele of mEPHX1 polymorphism had a higher risk of T2DM and IR occurrence with lower insulin sensitivity, while mEPHX1 exon 4 polymorphism had no significant association with T2DM and IR.