

Abstract

We chose to study polymorphisms of vitamin D receptor gene (*VDR*), parathyroid hormone gene (*PTH*) and *CASR* gene whose protein products significantly affect calcium phosphate metabolism and are implicated in the pathogenesis of diabetes, which may also involve kidney damage.

The aim of this study was to find out whether the *VDR*, *PTH* and *CASR* polymorphisms are associated with the risk of developing diabetes mellitus and its renal complications. The frequencies of alleles and genotypes were studied in the groups of diabetic patients with and without kidney complications using either TaqMan probes or PCR-RFLP.

Comparison of patients with diabetic nephropathy (DN) and healthy subjects identified statistically significant difference for the *FokI* polymorphism in *VDR* gene ($P < 10^{-4}$) and also for the *BstBI* polymorphism in *PTH* gene ($P = 0,023$). *DraIII* polymorphism in *PTH* gene is associated with the risk of developing diabetes and its renal complications. In DN patients, the BBFFAATt haplotype of *VDR* gene was more frequent than in healthy subjects ($P = 0,046$), and the BbFFAaTt variant was more frequent than in DM2 patients ($P = 0,018$). The BBDD haplotype of *PTH* gene seems to be a predisposing factor for diabetes itself ($P = 0,019$).

The allele frequencies and genotype distribution for rs3804594 and rs1042636 polymorphisms *CASR* gene in the patient groups were compared with the control group of healthy subjects and the control group of non-diabetic renal failure (NWD) patients. We have found that rs3804594 polymorphism is a risk factor for the development of diabetes (DM2 $P = 0,002$; NDRD = 10^{-3}) itself and for non-diabetic renal failure ($P = 0,0005$).

Polymorphisms rs1501898, rs1801725 and rs7652589 *CASR* gene were studied only in type 1 and type 2 diabetes patients without complications and compared with the control group of healthy blood donors. We have found that rs7652589 polymorphism is associated with type 1 diabetes ($P = 0,0098$).