Paraoxonase 1 (PON1), an antioxidant enzyme closely associated with HDL (high-density lipoproteins), preserves LDL (low density lipoproteins) against oxidation. Less protection may be therefore supposed by decreased PON1 activity. This study was undertaken to investigate the association of PON1 gene polymorphisms with diabetic angiopathy and to evaluate the relationship of these polymorphisms with PON1 activity. Total of 86 Type 1 (T1DM) and 246 Type 2 (T2DM) diabetic patients together with 110 healthy subjects were examined. DNA isolated from leukocytes was amplified with polymerase chain reaction (PCR) followed by restriction enzyme digestion. The products were analyzed for L55M and Q192R polymorphisms in coding region and for −107 C/T and −907 G/C in promoter sequence of PON1. Serum enzyme activity was measured spectrophotometrically. Significant differences were found between T1DM or T2DM and control persons in L55M polymorphism (allele M more frequent in T1DM and T2DM vs. controls, p<0,05) and Q192R polymorphism (R allele less frequent in T1DM and T2DM vs. controls, p<0,01) of the PON1 gene. Serum PON1 activity was significantly decreased in T1DM (110±68 nmol/ml/min) and T2DM patients (118±69 nmol/ml/min) compared to the control persons (203±58 nmol/ml/min), both p<0,01. The presence of MM and QQ genotypes was accompanied by lower PON1 activity than of LL and RR genotypes (p<0,05), respectively. Better diabetes control was found in patients with LL than with MM genotypes and similarly in RR genotype than QQ genotype with p<0,05. Significantly different allele frequencies were found in diabetic patients with macroangiopathy than in those without it (M: 0,59 vs. 0,44, R: 0,12 vs. 0,19, p<0,01).

The association of PON1 polymorphisms, lower PON1 activity and poorer diabetes control found in patients with macroangiopathy further support an idea of genetic factors contributing to development of vascular disorders in diabetes.