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Abstract: BACKGROUND: Matrix metalloproteinases (MMP) are expressed after ischemic stroke. These proteases are responsible for a higher incidence of hemorrhages, are correlated to size of infarction and influence the effects of recombinant tissue plasminogen activator treatment. We therefore evaluated single nucleotide polymorphisms (SNP) of MMP-2 in different subtypes of stroke patients in an association study using a case-control design. METHODS: 197 stroke patients were divided according to modified TOAST criteria (small vessel disease, large vessel disease, hemorrhagic stroke and asymptomatic carotid artery stenosis) and compared to 143 controls. Clinical data like age, sex, risk factors and diagnostic results including MRI or cranial CT scans and ultrasound evaluations of intra- and extracranial arteries were obtained. Genotypes of MMP-2 (12 SNP) were compared to controls and DNA samples were analyzed by matrix-assisted laser desorption/ionization time-of-flight (MALDI-TOF) analysis. Logistic regression analysis was performed for small vessel disease to test for interactions between markers and defined clinical risk factors. Additionally, MMP-2 serum levels obtained in the first 24 h after stroke were measured. RESULTS: From the MMP-2 gene, 5 markers (rs1030868, rs2241145, rs2287074, rs2287076, ...
rs7201) showed a significant association with small vessel infarcts (p< 0.05) and rs7201:g.C was identified as an independent risk factor by multivariable logistic regression analysis. MMP-2 protein levels were significantly lower in this group (174 +/- 48 ng/dl) versus controls (214 +/- 56 ng/dl). For other stroke subtypes, no significant association with MMP-2 SNP could be found. CONCLUSION: Our study demonstrates an association of the MMP-2 gene with the development of lacunar stroke, and no association of MMP-2 with other stroke subtypes.

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