Human Leucocyte Antigen, Infections and Systemic Inflammatory Biomarkers in Early Atherosclerosis in Children and Adolescents with Type 1 Diabetes

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Background: This prospective study focuses on factors associated with arterial damage in children with type 1 diabetes (T1D). Eighty children and adolescents with T1D (mean age 15, range: 8-20 yrs; mean diabetes duration 7, range: 0.5 to 19 years) were investigated twice, approximately 2 years apart, for carotid artery intima-media thickness (cIMT) and compliance (CAC), flow-mediated dilatation (FMD) of the brachial artery, and plasma levels of matrix metalloproteinase (MMP)-8. HLA genotypes were determined in dried spots of peripheral blood by polymerase chain reaction followed by hybridization assay. The number of respiratory tract infections (RTI) during the past year was obtained by a questionnaire in 56 patients.

Results: cIMT progression (% change of cIMT from baseline) correlated inversely with the % changes of both CAC (p=0.04, r=-0.3, n=62) and FMD (p=0.03, r=-0.3, n=67). RTI frequency correlated significantly with cIMT progression irrespective of age, diabetes duration, BMI, and HbA1c (p=0.03, r=0.3, in multivariate analysis). When patients were divided in relation to DQ2/8 genotype and RTI, the association of DQ2/8 with cIMT progression remained significant in patients with over three infections/year (p=0.04, r=0.3). During follow-up, the group of DQ2/8 patients with CRP> 1 mg/l showed significantly higher levels of plasma MMP-8 than the non-DQ2/8 group.

Conclusions: Diabetes-risk genotype DQ2/8 and inflammation contribute to vascular changes in children and adolescents with T1D.