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Adverse Lipid and Inflammatory Changes in Young Nondiabetic First-Degree Relatives of Type 1-Diabetic Patients

Englund E., Maxedius A., Odermarsky M., Liuba P.
Pediatric Cardiology, Pediatric Heart Center, Skåne University Hospital, Lund, Sweden

Background: Previous studies from our and other centers on young patients with type 1 diabetes (T1D) have indicated pro-atherosclerotic changes in the carotid arteries and in the lipid and systemic inflammatory profiles without a clear relationship between these changes and the hyperglycemic control. We have also earlier found in these patients a certain HLA-related genetic susceptibility to adverse vascular changes.

Objective: To assess whether pro-atherosclerotic changes are present in apparently healthy first-degree relatives of patients with T1D.

Methods: Plasma lipids, C-peptide (index of insulin secretion), C-reactive protein (CRP), and the carotid artery intima-media thickness (CA-IMT), compliance (CAC) and stiffness index (SI) were assessed in up to 116 non-diabetic first-degree relatives (FDR; mean age: 12.6 years; 56 female) of patients with T1D and in up to 43 age-matched control individuals (mean age: 13.3 years; 23 female) without heredity for cardiovascular risk factors. The number and type of clinically manifest acute infections during the past year were obtained via a questionnaire validated in our previous studies.

Results: There was no difference in age, gender, body mass index, arterial blood pressure and C-peptide levels between the FDR and control groups ($p>0.2$). Also, there was no significant difference in SI ($p=0.2$), CAC ($p=0.1$) and CA-IMT ($p=0.9$) between the groups. In the FDR group, plasma CRP and LDL- cholesterol (LDL-C) were increased ($p<0.05$ for both) and HDL-C was decreased ($p<0.0001$) as compared to the control group. The changes in LDL-C and HDL-C were most marked in FDR individuals with ≥ 4 acute respiratory infections during the past year (Figure).

Conclusion: Adverse lipidemic and inflammatory changes are present in healthy non-diabetic first-degree relatives of T1D patients, probably related to their genetic susceptibility to this disease. Further analyses of additional indices of peripheral arterial function in these groups are under way.