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IMMUNOPHENOTYPING OF CHEMOKINE RECEPTORS ON PERIPHERAL BLOOD MONONUCLEAR CELLS IN CHILDREN WITH TYPE 1 DIABETES

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INTRODUCTION: Type 1 diabetes (T1D) is a chronic autoimmune disease characterized by insulin deficiency, hyperglycemia and metabolic disturbances. Chemokines contribute to low-grade inflammation, which predisposes to the development of vascular complications. Our aim was to determine the chemokine receptor phenotype on peripheral blood mononuclear cells (PBMCs) in children with T1D.

METHODS: Mononuclear cells were isolated from peripheral blood of healthy controls (n=13) and children with T1D (n=22). B-cell (CD19+), T-cell (CD3+) and monocyte (CD14+) phenotype was determined using flow cytometry for the following chemokine receptors: CCR2, CCR4, CXCR3 and CXCR4. Frequencies of PBMC subpopulations expressing chemokine receptors were correlated with clinical parameters indicating disease activity (HbA1c and insulin dose), vascular complications (blood pressure and lipid profile) and inflammation (CRP and fibrinogen).

RESULTS: Major immune population frequencies did not differ between groups, however there was a decrease of CCR2+ monocytes in T1D group ($p=0.019$) as well as expansion, though non-significant, of CCR4+ T-cells. Expression of CXCR3 and CXCR4 on PBMCs was similar among T1D patients and controls. Monocytes expressing CCR2 were negatively associated with HbA1c levels ($\rho=-0.459$) and T-cells expressing CCR4 were negatively associated with systolic blood pressure ($\rho=-0.389$).

CONCLUSION: Because of the migratory role of CCR2, we propose the decrease in CCR2+ monocyte subpopulation is due to the increased peripheral sequestration that contributes to the disease pathogenesis and its vascular complications. In contrast, T-cells expressing CCR4 may have a protective role and are therefore, decreased, in children with vascular complications.

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