P-170

Matrix Metalloproteinase-8 Activity is Increased in Type 1 Diabetes Children with High-Risk Diabetes HLA and Systemic Inflammation

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Background: Matrix metalloproteinases (MMPs) and myeloperoxidase (MPO) are colocalized to lipid-laden macrophages, and play a central role in initiation and propagation of chronic vascular diseases including atherosclerosis. Prior cross-sectional studies from our centre on children and adolescents with type 1 diabetes suggested possible propensity conferred by diabetes-risk HLA DQ2/8, particularly in an inflammatory milieu, to peripheral vascular dysfunction, an important precursor of atherosclerosis. In the same population, we aimed to assess whether this putative interplay between DQ2/8 and inflammation also reflects into increased activity of MMP and MPO.
Methods: Blood pressure, inflammatory, lipid, HbA1c, cyclic guanilate monophospate (cGMP), along with degree of exposure to secondhand tobacco smoke (STS) were determined in 74 children and adolescents with type 1 diabetes at baseline and 1 year later. MMP-8 and MPO levels were measured only at the 2nd time-point.
Results: In univariate regression, baseline BMI, HbA1c, CRP(log), and TC/HDL were all predictors of 1-year MMP-2 ($p<.05$ for all), while exposure to STS, BMI, cGMP, and TC/HDL predicted levels of MPO ($p<.05$ for all). The rise in serum MMP-8 was most increased in those with both DQ2/8 and CRP >1 mg/l ($p=0.01$), but no such difference was noted with regard to MPO.
Conclusion: In young patients with type 1 diabetes, increased activities of MMP and MPO appear to relate mainly to dyslipidemia, but inflammation, particularly in those with diabetes-risk HLA, and exposure to tobacco smoke could be important stimuli as well.