SYSTEMIC INFLAMMATION AND ARTERIAL ENDOTHELIAL DYSFUNCTION AS POSSIBLE MECHANISMS OF RENAL INJURY IN YOUNG PATIENTS WITH TYPE 1 DIABETES

ACC Oral Contributions
Georgia World Congress Center, Room B403
Monday, March 15, 2010, 5:30 p.m.-5:45 p.m.

Session Title: Modulators of Endothelial Dysfunction
Abstract Category: Vascular—Pathophysiology—Clinical
Presentation Number: 0915-07

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Background: Diabetic nephropathy is a serious complication in patients with insulin-dependent (type 1) diabetes mellitus accounting for end-stage renal disease in about one third of such patients, but the mechanisms remain elusive. We sought to investigate in young patients with type 1 diabetes whether alpha glutathione S transferase (GST):creatinine ratio, a marker of tubular renal dysfunction, is related to systemic inflammation and arterial dysfunction.

Methods: Ninety-six children and adolescents (52 male and 44 female; median age and diabetes duration 15 and 7 years, respectively) with type 1 diabetes were assessed for blood levels of alphaGST:creatinine ratio, and for markers of inflammatory (plasma C-reactive protein, fibrinogen and tumor necrosis factor-alpha) activity and arterial endothelial function. The latter was assessed by external ultrasound of the brachial artery (flow-mediated dilatation, FMD).

Results: Brachial artery FMD showed a weak, yet significant inverse correlation with alphaGST:creatinine ratio (p=0.04, r=-0.3). When patients were divided based on their exposure to secondhand smoke (SHS), this association between FMD and alphaGST:creatinine ratio remained borderline significant (p=0.07) in patients regularly exposed to SHS but not in the SHS-nonexposed patients (p>0.3). alphaGST:creatinine ratio was also decreased in patients with CRP > 1 mg/L (p=0.049), and showed a slight inverse correlation (p=0.06, r=-0.3) with the number of respiratory infections during the past year.

Conclusion: The findings support the hypothesis that renal injury in type 1 diabetes might be in part related to inflammatory and vascular endothelial mechanisms.