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IgE to the Mammalian Oligosaccharide Galactose- α -1,3-Galactose Is Associated with Increased Atheroma Volume and Plaques with Unstable Characteristics

Jeffrey M. Wilson¹, Anh T. Nguyen², Alexander J. Schuyler¹, Scott P. Commins³, Angela M. Taylor², Thomas A.E. Platts-Mills¹, Coleen A. McNamara²

¹From the Division of Allergy and Immunology (J.M.W., A.J.S., T.A.E.P.-M.)

²Division of Cardiology, Robert M. Berne Cardiovascular Center (A.T.N., A.M.T., C.A.M.), University of Virginia, Charlottesville

³Division of Rheumatology, Allergy, and Immunology, University of North Carolina, Chapel Hill (S.P.C.).

Abstract

Objective—Emerging evidence suggests a link between coronary artery disease and type 2 immunity. We sought to test the hypothesis that IgE sensitization to the mammalian oligosaccharide galactose- α -1,3-galactose (α -Gal)—the target allergen of delayed anaphylaxis to red meat—is associated with coronary artery disease.

Approach and Results—Total IgE and specific IgE to α -Gal were assayed on sera from 118 subjects who presented for cardiac catheterization and underwent intravascular ultrasound. IgE to α -Gal was detected in 26%, and atheroma burden was higher in sensitized subjects ($P=0.02$). Because α -Gal sensitization relates to an environmental exposure that could be a risk factor for early-onset coronary artery disease (ie, tick bites), we age stratified the cohort. In subjects ≤ 65 years of age, the strength of the association with atheroma burden was stronger ($P<0.001$), and plaques in the sensitized group had less stable features based on intravascular ultrasound. To address the specificity of the association with IgE to α -Gal, IgE to inhalants and peanut were assayed and were not associated with coronary artery disease. Total IgE and α -Gal-specific IgE were strongly associated with each other, but the strength of the relationship with atheroma burden was stronger for α -Gal-specific IgE. This association was significant when adjusted for sex, diabetes mellitus, hypertension, statin use, and total IgE (regression coefficient, 12.2; SE, 5.2; $P=0.02$).

Conclusions—Increased atheroma burden and plaques with more unstable features were associated with IgE to α -Gal—an effect most pronounced in subjects ≤ 65 years of age. IgE sensitization to α -Gal may represent a novel, and potentially modifiable, risk factor for coronary atherosclerosis.

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9110 East Nichols Avenue • Centennial, CO 80112 • 303.694.0305



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