

Complement C3 and the Development of Type 2 Diabetes Mellitus – The ARIC Study

Year: 2005

Abstract Number: 364-OR

Authors:

BRUCE B. DUNCAN, MARIA I. SCHMIDT, DAVID COUPER, CHRISTIE M. BALLANTYNE, HEEJUNG BANG, RON C. HOOGEVEEN, JAMES S. PANKOW

Institutions:

Porto Alegre, RS, Brazil; Chapel Hill, NC; Houston, TX; Minneapolis, MN

Results:

Adipocyte-derived proteins have been increasingly linked to diabetes and atherosclerosis, both in epidemiologic and in basic science research. Complement C3 is produced by adipocytes, as well as by other cell types. Besides its important immune actions, C3 has metabolic functions, being a precursor to acylation stimulating protein, a potent stimulator of triglyceride synthesis in adipocytes. Epidemiologic studies have shown important associations of C3 with insulin resistance. To gain insight into the role of C3 in the development of diabetes, we conducted a case-cohort study representing the approximately 9-year experience of 10,275 middle-aged, African-American and white, initially non-diabetic participants of the Atherosclerosis Risk in Communities Study. C3 was measured on stored plasma of 581 incident diabetes cases and 572 non-cases. Adjusted levels of C3 were higher in African-Americans (158 mg/dL; 95%CI 154 - 162 mg/dL) than in whites (145 mg/dL; 141 - 148 mg/dL) and in the obese (164 mg/dL; 157 - 172 mg/dL) than in those with normal weight (136 mg/dL; 131 - 140 mg/dL) ($P < 0.001$). Overall hazard ratios for developing diabetes, for those in the 2nd, 3rd and 4th (vs. 1st) quartile of C3 were 1.9 (1.2 - 3.0), 3.0 (2.0 - 4.6) and 4.8 (3.1 - 7.4) after adjustment for age, gender, ethnicity, study center, parental history of diabetes, and hypertension; and 1.8 (1.1 - 3.1), 1.6 (0.95 - 2.8) and 2.0 (1.1 - 3.5) after additional adjustment for body mass index, waist-hip ratio, fasting glucose, and insulin at baseline. The association was of similar magnitude in whites and African-Americans, smokers and non-smokers, and risk was no greater in obese than in normal weight participants. In conclusion, in this community-based sample of U.S. adults, high levels of complement C3 were associated with a greater incidence of diabetes.

Category:

Epidemiology