

Abstract

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Intercellular adhesion molecule-1 concentration is genetically correlated with insulin resistance, obesity, and HDL concentration in Mexican Americans.

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BACKGROUND: The metabolic syndrome and type 2 diabetes are associated with endothelial activation (and thus with inflammatory processes leading to atherosclerosis), but the mechanisms that underlie these associations are not fully understood. Endothelial intercellular adhesion molecule (ICAM)-1 plays an important role in the recruitment of immune cells during the development of atherosclerotic plaque and is a marker of inflammatory disease.

METHODS: We performed bivariate quantitative genetic analyses to estimate genetic and environmental correlations between circulating ICAM-1 concentration and 17 phenotypes associated with the metabolic syndrome. Our study population comprised 428 adults in 20 extended Mexican-American families from the San Antonio Family Heart Study (SAFHS).

RESULTS: Circulating ICAM-1 concentration is heritable ($h^2 = 0.56$). ICAM-1 concentration showed significant positive genetic correlations (range 0.32-0.52, $P < 0.05$) with fasting insulin, insulin 2 h after oral glucose challenge, homeostasis model assessment of insulin resistance, BMI, waist circumference, and leptin concentration; negative genetic correlation with HDL3 cholesterol concentration; and negative environmental correlation with adiponectin concentration. Significant genetic correlations were not found between ICAM-1 and fasting or 2-h serum glucose or systolic or diastolic blood pressure.

CONCLUSION: Thus, ICAM-1 expression may share common genetic modulation with traits related to obesity, insulin resistance, and HDL3 cholesterol, but not with hyperglycemia or hypertension per se.

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