

EXERCISE AND ADIPOCYTOKINES

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Adipose tissue, particularly that from the intra-abdominal (visceral) area, releases a variety of metabolic factors (i.e., adipocytokines) that can either contribute to or protect against cardiovascular disease and diabetes. Regularly practiced exercise can reduce visceral adiposity and other CVD/diabetes risk factors, but its effects on many adipocytokines are currently unknown. The purpose of the proposed investigation is to test the central hypotheses that (A) exercise training will improve plasma concentrations of three adipocytokines, plasminogen activator inhibitor-1 (PAI-1), tumor necrosis factor-alpha (TNF-alpha) (both contributors to CVD/diabetes), and adiponectin (protective against CVD/diabetes), and (B) exercise-induced changes in these adipocytokines will occur in relation to reduced adiposity, particularly visceral adiposity. These hypotheses are to be tested through use of plasma samples and data previously collected from the NIH-funded HEalth, Risk factors, exercise Training And GENetics (HERITAGE) Family Study, which implemented a standard 20-week vigorous exercise training program in over 700 black and white women and men in the U.S. and Canada. The SPECIFIC AIMS of the proposed project are to: (1) investigate the effect of the HERITAGE exercise training program on plasma concentrations of PAI-1, TNF-alpha, and adiponectin in black and white women and men, and (2) compare exercise training-induced changes in PAI-1, TNF-alpha, and adiponectin to changes in visceral and overall adiposity (assessed via computed tomography), as well as other components of the metabolic syndrome, including insulin sensitivity (estimated via intravenous glucose tolerance testing), plasma triglyceride and HDL-cholesterol concentrations, and blood pressure. It is expected that this exercise training protocol results in favorable alterations of PAI-1, TNF-alpha, and adiponectin and that these alterations are related to the reduced visceral adiposity already documented in HERITAGE. Considering the escalating prevalence of obesity and diabetes, the proposed research is significant because it addresses the effect of a non-pharmaceutical intervention on adipocytokines (PAI-1, TNF-alpha, and adiponectin) that provide physiological linkage among obesity, diabetes, and CVD.