Relationship Between Body Composition, Body Fat Distribution, and Blood Lipids Among Law Enforcement Officers: Part 2

MEGAN LEONARD[1], ADRIANA GIL[2], BRODERICK L. DICKERSON[1], RYAN J. SOWINSKI[1], MATTHEW J. MCALLISTER[3], DREW E. GONZALEZ[1], & STEVEN E. MARTIN[1]

[1]Tactical Athlete Research Unit, Department of Kinesiology and Sports Management, Texas A&M University, College Station, TX
[2]College of Medicine, University of Houston, Houston, TX
[3]Metabolic and Applied Physiology Laboratory; Department of Health and Human Performance, Texas State University, San Marcos, TX

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Advisor / Mentor: Martin, Steven (semartin@tamu.edu)

ABSTRACT

Law enforcement officers (LEOs) have a high-stress occupation, which is prone to cardiovascular disease (CVD). Data suggest a 1.7-fold higher CVD prevalence versus the general public, in addition to 40.5% of LEOs being classified as obese. Emerging evidence suggests that lipid-related atherosclerotic risk may be better captured by including advanced blood lipid panels (i.e., cholesterol particle type and size). However, there needs to be more research regarding the relationship between body composition, body fat distribution, and advanced blood lipid panels concerning CVD risk in LEOs. **PURPOSE**: To determine if body composition and fat distribution measures correlate with predictive advanced lipid markers in LEOs. **METHODS**: Forty-three LEOs (male: n=40; Female: n=3; age = 41.7±9.6 yrs; weight = 91.9±15.4 kg; height = 179.8±8.7 cm; VO_{2max}: 37.0±6.1 ml/kg/min) from a local police department were evaluated. Fasting blood samples were collected to assess biomarkers of CVD risk: number of low-density lipoprotein particles (LDL-p), small LDL-p, LDL size (LDL-s), number of high-density lipoprotein particles (HDL-p), large HDL-p, HDL size (HDL-s), number of very low-density lipoprotein particles (VLDL-p), and VLDL size (VLDL-s). Dual-energy x-ray absorptiometry was used to measure body composition. Bivariate Pearson correlation matrix and ordinary least squares (OLS) regression analyses were used to examine the relationship between body composition and fat distribution. **RESULTS**: The Bivariate Pearson correlation matrix revealed higher body weight, lean mass, visceral adipose tissue, and gynoid adiposity correlated with several advanced lipid biomarkers. The OLS regression analysis revealed Body weight to be positively predictive ($p<0.05$) of LDL-p and small LDL-p but inversely predictive ($p<0.05$) of LDL-s, large HDL-p, and HDL-s; Lean mass to be positively predictive of LDL-p, small LDL-p, but inversely predictive of LDL-s, HDL-p, large HDL-p, and HDL-s; Visceral adipose tissue to be positively predictive of small LDL-p and large VLDL-p, but inversely predictive of LDL-s, large HDL-p, and HDL-s; and gynoid fat distribution to be positively predictive of HDL-p, large HDL-p, and HDL-s. **CONCLUSION**: Changes in body composition seen in LEOs with increased weight and fat distribution showed correlations with advanced blood lipid markers, which can be predictive of high CVD risk and other potential medical conditions. These data provide insight into the association of body composition and fat distribution with markers of CVD risk (i.e., advanced blood lipids).