Changes in Cardiovascular Disease Risk Factors Over 2 Years Among Law Enforcement Officers

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ABSTRACT

Law enforcement officers (LEOs) have heightened cardiovascular disease (CVD) risk due to the nature of their occupations. Data suggests CVD is 1.7 times more prevalent when compared to the general public. Considering the numerous stressors that LEOs face, which exacerbate their CVD risk, it is important to consider annual monitoring of the risk factors (i.e., obesity, hyperlipidemia, hypertension, etc.). **PURPOSE**: To examine cardiovascular health parameters in male and female LEOs over two years. **METHODS**: Twenty-one LEOs (entry demographics: age = 43.5±10.0 yrs; weight = 92.9±15.4 kg; height = 176.8±9.1 cm), from a local police department, were studied from annual clinical assessments separated by two years (2021 [YR1] to 2023 [YR3]). Fasted blood samples were collected to assess biomarkers of CVD risk, including advanced lipids (i.e., cholesterol particle type and size), lipid panels, and blood glucose. Waist and hip measures were taken, and Dual-energy X-ray Absorptiometry was used to assess body composition. Participants completed a maximal cardiopulmonary exercise test (CPXT), where VO_{2max} was estimated from the Foster equation. Shapiro-Wilk Test was used to assess normality. Two-tailed paired t-tests were used to assess changes over time, with an alpha level of $p<0.05$. Cohen's d effect sizes were also calculated (i.e., small [0.2-0.5], medium [0.5-0.8], large [>0.8]) as well as McNemar's tests of differences for the prevalence of obesity, hypercholesteremia, and hypertension. **RESULTS**: Body weight (YR1: 93.5±15.6 kg; YR3: 94.1±15.3 kg) and body mass index (YR1: 29.7±4.1 kg/m²; YR3: 29.9±3.8 kg/m²) were not significantly different. Lean mass (YR1: 68.1±10.8 kg; YR3: 71.6±10.9 kg; p=0.001, d=-2.14), hip circumference (YR1: 40.1±3.6 in; YR3: 42.1±1.9 in; p=0.007, d=-0.78), visceral adipose tissues (YR1: 91.8±27.3 cm²; YR3: 99.1±30.2 cm²; p=0.008, d=-0.73), total cholesterol (YR1: 173.9±35.0 mg/dL; YR3: 189.0±32.0 mg/dL; p=0.005, d=-0.71), and low-density lipoproteins(YR1: 1326.7±367.0 nmol/L; YR3: 1493.5±332.8 nmol/L; p=0.019, d=-0.65) all increased over the two years. Whereas very low-density lipoprotein size (YR1: 48.5±3.8 nm; YR3: 45.6±2.5 nm; p=0.009, d=0.74) and waist-to-hip ratios (YR1: 0.93±0.07; YR3: 0.89±0.07; p=0.037, d=0.57) both decreased. Lastly, there were no significant (p>0.05) changes in the prevalence of obesity, hypercholesteremia, or hypertension. **CONCLUSION**: Limited data exists regarding the annual monitoring of LEOs' CVD risk. These data show the fluctuations of several risk factors LEOs experience over two years, highlighting the importance of annual monitoring for CVD risk with clinical testing in this population.