Title: Relationship between Arterial Stiffness, Physical Activity & Sedentary Time in Young Middle-Eastern Population

Category: Prevention

Abstract

Background: Arterial stiffness (AS) and physical activity are independent cardiovascular(CV) risk factors and predict outcome. We and others have shown that PA is associated with AS; however, the data is largely derived from older, Caucasian populations assessing PA with questionaires. The aim of this study was to explore the relationship between AS and PA using actigraphy in a young Middle-Eastern(ME) population, hitherto not studied.

Methods : 320 apparently healthy subjects (mean age 20.7±3 years, 52% females) were enrolled in this cross-sectional study. After recording sociodemographic and clinical data, anthropometric measurements performed included weight, height, waist and hip, total body fat , visceral fat and muscle mass. Blood pressure(BP) and AS were measured using the SphygmoCor and Mibilograph as pulse wave velocity (PWV), central BP and augmentation index(AIx) after supine rest. Participants received an accelerometer (ActiGraph) to wear on the wrist for 7 consecutive days. The average minutes/day spent at different PA intensities (min/day) was determined according to established cut-points as well as metabolic equivalents(METS).

Results: PWV was associated with age (r=0.25, p<0.001), brachial systolic BP(r=0.57, p<0.0001), aortic systolic BP(r=0.65, p<0.0001), cardiac output(r=0.39, p<0.0001), METS achieved(r=-0.42, p<0.0001), light activity (r=-0.25, p<0.001), moderate-to-vigorous (r=-0.29, p<0.001), sedantary time (r=0.45, P<0.0001), waist(r=0.47, p<0.0001), visceral fat(r=0.39, p<0.001) and muscle mass(r=-0.31, p<0.01). In a stepwise regression model with PWV as the dependent variable, age, MAP, gender, METS achieved and sedentary time emerged as independent determinants of PWV(R^2=0.39, p<0.0001).

Conclusions: Our results highlight the deleterious effects of sedentary time on vascular function, independent of physical activity and energy consumption in a young, healthy ME population.