Anthropometric Predictors of Arterial Stiffness When Adjusting for Fitness in College-Aged Adults

RILEY MORTON, KYLI ALVAREZ, MALIA NOWLEN, ESTEPHANIA CAMPA, ZACHARY ZEIGLER

College of Science, Engineering, and Technology; Grand Canyon University; AZ

ABSTRACT

PURPOSE: Cardiovascular Disease (CVD) is the largest cause of non-communicable disease death worldwide. Arterial stiffness is an independent predictor of CVD. Body mass index (BMI), waist circumference (WC), and waist-to-hip ratio predict arterial stiffness. However, there is inconstancy in the literature as to which is the best predictor of arterial stiffness. Measured cardiovascular fitness is also an independent predictor of arterial stiffness and is rarely controlled for in epidemiological studies. The purpose of this study was to identify the superior anthropometric predictor of arterial stiffness after controlling for measured fitness. **METHODS**: Healthy young adults were recruited from Grand Canyon University. Subjects came to the lab for one visit and had anthropometric measures of height, weight, WC, and hip circumference measured. Additionally, aortic blood pressure (BP), augmentation pressure (AP), augmentation index adjusted at a heartrate of 75 (Aix@75), carotid-femoral pulse wave velocity (cfPWV), and a VO_{2peak} test were completed. **RESULTS**: 210 participants aged 20.8 ± 3.1 yr with a BMI of 25.3 ± 3.8 kg/m^2 and a VO_2peak of 36.2 ± 8.6 $mL.kg.^{-1}min^{-1}$ completed this study. Hierarchical regression analysis was run with age, gender, and VO_2peak entered into the first block, and the anthropometric variables entered into the second block. The addition of BMI significantly explained 4.2% (p = 0.03) more variance in predicting central SBP and 6% (p = 0.001) more variance when explaining cfPWV. The addition of WC significantly explained 2.5% (p = 0.001) more variance in central systolic BP and 5% more variance in cfPWV (p = 0.002). The addition of waist-to-hip ratio explained 4.8% more variance in predicting cfPWV (p = 0.003). **CONCLUSION**: In conclusion, after accounting for measured fitness, it appears that BMI, WC, and waist to hip ratio all predict arterial stiffness. BMI explained the greatest amount of variance in predicting arterial stiffness.