

## **Vascular Health and Fitness Levels in Metabolically Healthy and Unhealthy Obesity**

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Obesity is related to cardiovascular disease (CVD), impaired vascular health, and other chronic disease. Within the obese population, those that are metabolically healthy (MHO) are hypothesized to have lower CVD risk as compared to the metabolically unhealthy (MUHO), because of their lower levels of vascular inflammation. However, research is limited examining whether vascular health differs between MHO and MUHO. **PURPOSE:** We compared vascular measures and fitness levels between adults with MHO or MUHO. **METHODS:** On separate days, 64 (36 MHO  $31.3 \pm 13.8$  yrs old, 28 MUHO  $32.6 \pm 13.6$  yrs old) adults recruited from the Philadelphia suburban area came to the lab for testing. After an overnight 12-hour fast, participants underwent carotid artery intima thickness (IMT) ultrasound, brachial artery flow mediated dilation (FMD), fasted glucose/cholesterol testing, body composition (bioelectrical impedance), and blood pressure (BP) measurement. During another visit, participants completed  $VO_{2peak}$  treadmill testing and had subsequent BP measurements taken. In accordance with previous literature metabolic risk factors were defined as: BP  $\geq 130/85$  mmHg or on antihypertensives; fasting glucose  $\geq 100$  mg/dL or on antidiabetic medications; BMI  $\geq 30$  Kg/m<sup>2</sup> or BF  $\geq 25\%$ ; triglycerides  $\geq 150$  mg/dL; and HDL  $\leq 40$  mg/dL. Participants with less than two risk factors were considered MHO and those with two or more risk factors were considered MUHO. **RESULTS:** We found that in the adults classified as MUHO weight was higher ( $235.4 \pm 41.0$  vs  $189.4 \pm 36.7$  lbs.), fat mass was higher ( $85.5 \pm 26.3$  vs  $60.8 \pm 19.6$  lbs.), and BP was higher (SBP:  $134.8 \pm 8.3$  vs  $123.2 \pm 8.8$  mmHg; DBP:  $80.4 \pm 5.9$  vs  $75.6 \pm 6.7$  mmHg). In addition, fasted plasma glucose levels were higher ( $96.4 \pm 9.8$  vs  $86.8 \pm 6.9$  mg/dL) and triglyceride levels were higher ( $160.8 \pm 69.6$  vs  $84.9 \pm 28.3$  mg/dL) in MUHO compared to MHO. We found no differences between groups for vascular health measures or fitness levels. **CONCLUSION:** Although adults with MUHO have impaired cardiovascular health compared to MHO, the population studied may be too young to discern vascular health differences. Further studies should investigate inflammation and other vascular measures, in addition to FMD and IMT, to discern possible differences in CVD risk between MUHO and MHO in adults.