



IMAGING AND DIAGNOSTIC TESTING

IMPACT OF PHYSICAL FITNESS ON ECHOCARDIOGRAPHIC LEFT VENTRICULAR MASS IN HEALTHY YOUNG BLACK AND WHITE ADULT MEN AND WOMEN: THE CORONARY ARTERY RISK DEVELOPMENT IN YOUNG ADULTS (CARDIA) STUDY

ACC Poster Contributions

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Background: Epidemiological studies have shown that left ventricular hypertrophy (LVH) by echocardiography predicts cardiovascular (CV) mortality and morbidity. Pathologic LVH is associated with older age, hypertension, higher body mass, and male sex. In contrast, physiologic LVH occurs in response to athletic training and is expected to have a benign prognosis. We hypothesized that CV fitness is associated with increased LV mass in a cohort of healthy young adults.

Methods: We used Coronary Artery Risk Development In Young Adults (CARDIA), a bi-racial cohort balanced by race (black and white) and sex, age 18 to 30 years at enrollment, to study 4,049 adults who completed a graded exercise treadmill test at year 0 and subsequently had an echocardiogram to assess LV mass (in gms/m^{2.7}) 5 years later. We used t-test to analyze the mean LV mass in those above and below the sex-specific median time exercised and used multiple linear regressions to examine the independent association of time exercised as a continuous variable with LV mass. We performed these analyses overall and within race-sex subgroups.

Results: The median treadmill duration times were 719 sec in men and 480 sec in women. Those whose exercise duration was above the median had significantly lower LV mass (black men: 36.9 vs. 38.2 gm/m^{2.7}, $p < 0.001$; white men: 35.1 vs. 36.4 gm/m^{2.7}, $p = 0.01$; black women: 32.8 vs. 37.0 gm/m^{2.7}, $p < 0.001$; white women: 31.6 vs. 33.6 gm/m^{2.7}, $p < 0.001$). The association of longer exercise duration at year 0 and lower LV mass 5 years later was independent of age, race, sex, and blood pressure (beta coefficient = -0.00912; $p < 0.0001$). Adjustment for body mass index removed this association (beta coefficient = 0.00081; $p = 0.41$).

Conclusions: In conclusion, "fit" young black and white men and women have lower LV mass compared to those who perform below the median for their sex group, contrary to the expectation of higher LV mass in the "fit group" of healthy young adults. This finding suggests that the increase in LV mass seen in the "unfit" group is likely not physiological, reinforcing the benefits of physical fitness early in adulthood and suggests the need for further study of CV fitness and its relation to CV risk factors in young adults.