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Cardiorespiratory fitness lowers the risk of atrial fibrillation (AF) in patients at high risk of AF

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Background/Introduction: Hypertension, type 2 diabetes mellitus (DM2) and obesity expressed as body mass index (BMI =30.0 kg of body weight/m2) all increase the risk for atrial fibrillation (AF). Studies indicate that increased cardiorespiratory fitness (CRF) resulting from moderate intensity aerobic activities attenuates the risk of developing AF. However, it is not known if increased CRF can attenuate AF risk in high-risk patients, defined as having at least two of the three aforementioned risk factors.

Purpose: To evaluate the association between CRF and AF incidence in patients at high risk of developing AF.

Methods: We identified 6,405 patients (mean age 58.0±10.0) with at least two of the following risk factors: HTN, DM2 or BMI =30.0 kg of body weight/m2. All participants completed an exercise treadmill test (ETT) as part of their clinical evaluation at the Washington DC., and Palo Alto Veterans Affairs Medical Centers. None had a diagnosis of AF at baseline. Metabolic equivalents (METs) were estimated based on the peak exercise time and treadmill grade. We established four fitness categories based on age-stratified quartiles of peak METs achieved: Least-Fit (4.6±1.2 METs; n=1,292); Low-Fit (6.6±1.2 METs; n=1,752); Moderately-Fit (8.0±1.3 METs; n=1,250); and Highly-Fit (10.7±2.1 METs; n=1,018). Cox proportional hazard models were applied to assess risk of AF. The models were adjusted for age, BMI, resting blood pressure, smoking, race, sleep apnea, chronic kidney disease, dyslipidemia, and CV/antihypertensive medications. The Least-Fit category served as the referent. P-values <0.05 using two sided tests were considered statistically significant.

Results: During a median follow-up period of 10.6 years, there were 679 incidences of AF (10.6%) or 11.9 events per 1000 person-years of follow-up. The association between exercise capacity and the risk for developing AF was inverse and graded. For every 1-MET increase in exercise capacity the AF-risk was 13% lower (HR=0.87; CI: 0.85-0.90; p<0.001). When compared to the Least-Fit category, the AF risk was 33% lower for the Low-Fit individuals (HR=0.67; CI: 0.55-0.82; p<0.001); 44% lower for the Moderate-Fit (HR=0.56; CI: 0.45-0.69; p<0.001) and 59% lower (HR=0.41; CI: 0.33-0.52; p<0.001) for High-Fit individuals.

Conclusion: Increased cardiorespiratory fitness attenuates the risk for developing AF in individuals at high-risk for developing AF. The association is inverse, independent and graded.