Exercise performance and the risk of incident atrial fibrillation

C.T. Lu¹, S.H. Sung¹
¹Taipei Veterans General Hospital, Taipei, Taiwan

Funding Acknowledgements: None.

Background: Atrial fibrillation (AF) is a global health problem that correlates with the increased risks of cardiovascular diseases, quality of life, mortality and global health expenditures. While many of cardiovascular risk factors have been related to the development of AF, a satisfied lifestyle behavior, including regular exercise and a good cardiorespiratory fitness, could be the upstream intervention to modify the risk factors and reduce the AF incidence.

Purpose: We examined the relationship of the exercise performance with risk of incident atrial fibrillation and its subsequent comorbidities.

Methods: From 2003 to 2012, we retrospectively included 19,680 consecutive patients without previous diagnosis of AF, who were referred to exercise treadmill testing for clinical reasons. The baseline characteristics and the exercise parameters during exercise testing were accessed in all enrolled subjects. Multivariable Cox proportional hazard models identified the independent association between exercise performance and risk of new-onset atrial fibrillation, risk of ischemic stroke and major adverse cardiovascular events (MACE). Cubic spline regression model assessed the risk of new-onset AF across fitness level.

Results: Among a total of 15,450 subjects (mean age, 54.9 ± 11 years; 59% male) with a median follow-up duration of 137 months, 515 (3.33%) new-onset AF cases were found. There was an 8% lower risk of AF incidence (hazard ratio, 0.92; 95% confidence interval, 0.88-0.97), a 12% lower risk of ischemic stroke incidence (hazard ratio, 0.88; 95% confidence interval, 0.83-0.94), and a 14% lower risk of MACE (hazard ratio, 0.86; 95% confidence interval, 0.84-0.88) for every 1 peak achieved metabolic equivalents (METs) increase in the exercise treadmill testing after adjusting confounding factors. In the subgroup analysis, the peak achieved METs during exercise treadmill testing was significantly associated with the risk of new-onset AF across various subgroups, including age, gender, body mass index (BMI) and underlying diseases. There were significant interactions in age subgroup (P for interaction 0.0047) and subgroup stratified by the presence of chronotropic incompetence (P for interaction 0.0212).

Conclusions: Exercise capacity is inversely correlated with AF incidence across fitness level. A better exercise performance indicates a lower AF incidence, ischemic stroke incidence and MACE. Regular physical activity may help to reduce inflammation and improve the function of the heart, which may help to prevent the development of AF. Further research is needed to fully understand the underlying mechanisms.
Subgroup analysis