Musculoskeletal Bulletin

Research informing practice

PURE PHYSIO CPD

Associations between physical fitness in male adolescents and atherosclerosis in middle age

The study has brought out the importance of assessing cardiorespiratory and muscular fitness in young males for cardiovascular risk.

Lifestyle advice, education and intervention at an early stage in young males may help to prevent further health risk in later life.

Clinicians should consider promoting long-term interventions to improve cardiorespiratory fitness and muscular strength in adolescents to prevent risk of atherosclerosis in adulthood.

Context

To examine the associations between physical fitness in male adolescents and coronary and carotid atherosclerosis in middle age.

Methods

- A population-based cohort study linking physical fitness during adolescence to atherosclerosis in middle age. The analysis included 8986 male adolescents (mean age 18.3 years).
- Cardiorespiratory fitness was assessed using a maximal cycle-ergometer test, and knee extension muscular strength was evaluated through an isometric dynamometer.
- Coronary atherosclerosis was evaluated via Coronary Computed Tomography Angiography (CCTA) and Coronary Artery Calcium (CAC) scores, while carotid plaques were evaluated by ultrasound scanner. This was done after a mean follow up of 38.2 years.

Results

- Physical fitness showed a reversed J-shaped association with CCTA stenosis and CAC, but no consistent association was observed for carotid plaques.
- After adjustments, compared with adolescents with the lowest physical fitness group (low cardiorespiratory fitness and muscular strength) had 22% and 26% lower ORs for severe coronary stenosis, respectively.
- The highest physical fitness group (high cardiorespiratory fitness and muscular strength) had 33% lower OR for severe coronary stenosis compared with those with the lowest physical fitness.

Reference

Herraiz-Adillo, Á., Ahlqvist, V. H., Higueras-Fresnillo, S., Hedman, K., Hagström, E., Fortuin-de Smidt, M., ... & Henriksson, P. (2024). Physical fitness in male adolescents and atherosclerosis in middle age: a population-based cohort study. British journal of sports medicine, 58(8), 411-420.