Abstract: P1513

Exercise-induced cardiac troponin I release and incident cardiovascular morbidity and mortality

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Topic(s):
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Background: Blood concentrations of cardiac troponin I (cTnI) above the 99th percentile (upper reference limit, URL) are a key criterion for the diagnosis of acute myocardial injury and infarction. cTnI concentrations, even below the URL, also predict adverse outcomes in general and patient populations. cTnI increases after exercise, but the clinical significance of this exercise-induced cTnI increase is unknown. We examined the association between exercise-induced cTnI elevations and clinical outcomes in long-distance walkers.

Methods: cTnI was measured in 726 participants (median 61 [54-69] yrs) before and immediately after 30-55 km of walking. The primary endpoint was a composite of all-cause mortality and major adverse cardiovascular events (MACE, i.e. myocardial infarction, stroke, heart failure, revascularization or sudden cardiac arrest). Results: Participants walked 498 [440-555] min at 68±10% of their maximum heart rate. Baseline cTnI concentrations were 2 [0-8] ng/L, with 9 participants (1%) demonstrating a baseline cTnI value above the URL (>40 ng/L). cTnI increased after walking (8 [1-18] ng/L, p<.001) and 63 participants (9%) had a post-exercise cTnI value >URL. During 43 [23-77] months of follow-up, 62 participants (9%) experienced a primary endpoint; 29 died and 33 had MACE. 27% of participants with post-exercise cTnI >URL experienced a primary endpoint compared to only 7% with cTnI below the URL (log-rank p<.001). The hazard ratio was 2.35 (95%CI:1.21–4.53) after adjusting for age, sex, cardiovascular risk factors (hypertension, hypercholesterolemia or diabetes mellitus), cardiovascular diseases (myocardial infarction, stroke or heart failure) and baseline cTnI.

Conclusion: Post-exercise cTnI concentrations >URL were associated with higher all-cause mortality and MACE, independent of age, sex, presence of cardiovascular risk factors or cardiovascular diseases and baseline cTnI concentrations in a large cohort of older long-distance walkers. Exercise-induced increases in cTnI may not be a benign physiological response to exercise in all, but an early marker of future mortality and cardiovascular events.
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