Fakultät für Medizin

Dokumenttyp: journal article

Autor(en) des Beitrags:
Hanssen, H; Keithahn, A; Hertel, G; Drexel, V; Stern, H; Schuster, T; Lorang, D; Beer, AJ; Schmidt-Trucksäss, A; Nickel, T; Weis, M; Botnar, R; Schwaiger, M; Halle, M

Titel des Beitrags: Magnetic resonance imaging of myocardial injury and ventricular torsion after marathon running.

Abstract: Recent reports provide indirect evidence of myocardial injury and ventricular dysfunction after prolonged exercise. However, existing data is conflicting and lacks direct verification of functional myocardial alterations by CMR [cardiac MR (magnetic resonance)]. The present study sought to examine structural myocardial damage and modification of LV (left ventricular) wall motion by CMR imaging directly after a marathon. Analysis of cTnT (cardiac troponin T) and NT-proBNP (N-terminal pro-brain natriuretic peptide) serum levels, echocardiography [pulsed-wave and TD (tissue Doppler)] and CMR were performed before and after amateur marathon races in 28 healthy males aged 41 ± 5 years. CMR included LGE (late gadolinium enhancement) and myocardial tagging to assess myocardial injury and ventricular motion patterns. Echocardiography indicated alterations of diastolic filling [decrease in E/A (early transmitral diastolic filling velocity/late transmitral diastolic filling velocity) ratio and E' (tissue Doppler early transmitral diastolic filling velocity)] postmarathon. All participants had a significant increase in NT-proBNP and/or cTnT levels. However, we found no evidence of LV LGE. MR tagging demonstrated unaltered radial shortening, circumferential and longitudinal strain. Myocardial rotation...
analysis, however, revealed an increase of maximal torsion by 18.3% (13.1 ± 3.8 to 15.5 ± 3.6 °; P=0.002) and maximal torsion velocity by 35% (6.8 ± 1.6 to 9.2 ± 2.5 °·s⁻¹; P<0.001). Apical rotation velocity during diastolic filling was increased by 1.23 ± 0.33 °·s⁻¹ after marathon (P<0.001) in a multivariate analysis adjusted for heart rate, whereas peak untwist rate showed no relevant changes. Although marathon running leads to a transient increase of cardiac biomarkers, no detectable myocardial necrosis was observed as evidenced by LGE MRI (MR imaging). Endurance exercise induces an augmented systolic wringing motion of the myocardium and increased diastolic filling velocities. The stress of marathon running seems to be better described as a burden of myocardial overstimulation rather than cardiac injury.

Zeitschriftentitel / Abkürzung:
Clin Sci (Lond)

Jahr:
2011

Band:
120

Heft / Issue:
4

Seiten:
143-52

Sprache:
eng

Pubmed:

Print-ISSN:
0143-5221

TUM Einrichtung:
ventive und rehabilitative Sportmedizin; Nuklearmedizinische Klinik und Poliklinik; r Medizinische Statistik und Epidemiologie

Occurences:
· Einrichtungen > Fakultäten > Fakultät für Medizin > Kliniken und Institute > Klinik und Poliklinik für Nuklearmedizin > 2011
· Einrichtungen > Fakultäten > Fakultät für Medizin > Kliniken und Institute > Institut für Medizinische Statistik und Epidemiologie > 2011
· Einrichtungen > Fakultäten > Fakultät für Medizin > Kliniken und Institute > Poliklinik für Präventive und Rehabilitative Sportmedizin > 2011

entries: