Dokumenttyp: Zeitschriftenaufsatz


Titel des Beitrags: Does exercise training impact clock genes in patients with coronary artery disease and type 2 diabetes mellitus?

Abstract: BACKGROUND: Recent findings revealed negative effects of deregulated molecular circadian rhythm in coronary artery disease (CAD) and type 2 diabetes mellitus (T2DM). Physical exercise training (ET) has been shown to promote anti-diabetic and anti-atherogenic responses in skeletal muscle of these patients, but the role of the circadian clock-machinery remains unknown. This study investigated whether mRNA expression of clock genes in skeletal muscle of CAD and T2DM patients is influenced by physical ET intervention.

METHODS: Nineteen patients with CAD and T2DM (age 64 ± 5 years) were randomised to either six months of ET (four weeks of in-hospital ET followed by a five-month ambulatory programme) or usual care. At the beginning of the study, after four weeks and after six months parameters of metabolic and cardiovascular risk factors, and physical exercise capacity were assessed. Gene expression was measured in skeletal muscle biopsies by quantitative real-time polymerase chain reaction (PCR). RESULTS: A selection of clock genes and associated components (circadian locomoter output...
cycle kaput protein (CLOCK), period (PER) 1, cryptochrome (CRY) 2 and aminolevulinate-de
ltA-synthase-1 (ALAS1)) was reliably measured and used for further analysis. A
time-dependent effect in gene expression was observed in CLOCK (p = 0.013) and a significant
interaction between time and intervention was observed for ALAS1 (p = 0.032; p = 0.014) as a
result of ET. CONCLUSION: This is the first study to analyse clock gene expression in skeletal
muscles of patients with CAD and T2DM participating in a long-lasting exercise intervention.
ET, as one of the cornerstones in prevention and rehabilitation of CAD and T2DM, exerts no
effects on CLOCK genes but meaningful effects on the clock-associated gene ALAS1.