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Acute Effects of Low-Level Laser Therapy on Patients' Functional Capacity in the Postoperative Period of Coronary Artery Bypass Graft Surgery: A Randomized, Crossover, Placebo-Controlled Trial

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Abstract

Objective: The aim of this study was to evaluate the acute effects of low-level laser therapy (LLLT) on the functional capacity to exercise tested by incremental shuttle walking test (ISWT) after coronary artery bypass graft (CABG) surgery. ***Methods:*** Fifteen male patients (60 ± 9 years) were crossed over during the experiment, to compare the outcomes after active LLLT and placebo LLLT treatments. LLLT (850 nm, 200 mW, 30 J to each point, resulting in a total of 240 J per quadriceps muscle), using a multidiode cluster (five spots; 6 J/spot) in eight points per leg was performed 3 min before the ISWT. We analyzed distance walked, Borg scale of perceived exertion, heart rate, and brachial arterial blood pressure. Markers of tissue damage [lactate dehydrogenase (LDH)] and oxidative stress [lipid peroxidation, total thiol levels, and antioxidant enzyme activity of superoxide dismutase (SOD) and catalase (CAT)] were also measured in peripheral blood. ***Results:*** Comparison of the distances walked revealed no significant differences between the LLLT and placebo LLLT groups ($p = 0.779$). Regarding the Borg scale ($p = 0.567$), heart rate ($p = 0.506$) as well as systolic and diastolic blood pressure ($p = 0.164$ and $p = 0.140$, respectively), no differences were observed between LLLT and placebo LLLT groups. Application of LLLT was not able to change levels of LDH ($p = 0.214$), oxidative lipid damage ($p = 0.733$), total thiol levels ($p = 0.925$), SOD ($p = 0.202$), and CAT ($p = 0.825$) enzyme activities. ***Conclusions:*** Acute LLLT improved neither functional capacity to exercise nor the markers of oxidation after CABG. Trial registration: Registered as a clinical trial (NCT02688426).

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