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# Low level laser therapy before eccentric exercise reduces muscle damage markers in humans.

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## Abstract

The purpose of the present study was to determine the effect of low level laser therapy (LLLT) treatment before knee extensor eccentric exercise on indirect markers of muscle damage. Thirty-six healthy men were randomized in LLLT group (n = 18) and placebo group (n = 18). After LLLT or placebo treatment, subjects performed 75 maximal knee extensors eccentric contractions (five sets of 15 repetitions; velocity = 60° seg(-1); range of motion = 60°). Muscle soreness (visual analogue scale--VAS), lactate dehydrogenase (LDH) and creatine kinase (CK) levels were measured prior to exercise, and 24 and 48 h after exercise. Muscle function (maximal voluntary contraction--MVC) was measured before exercise, immediately after, and 24 and 48 h post-exercise. Groups had no difference on kineanthropometric characteristics and on eccentric exercise performance. They also presented similar baseline values of VAS (0.00 mm for LLLT and placebo groups), LDH (LLLT = 186 IU/l; placebo = 183 IU/l), CK (LLLT = 145 IU/l; placebo = 155 IU/l) and MVC (LLLT = 293 Nm; placebo = 284 Nm). VAS data did not show group by time interaction (P = 0.066). In the other outcomes, LLLT group presented (1) smaller increase on LDH values 48 h post-exercise (LLLT = 366 IU/l; placebo = 484 IU/l; P = 0.017); (2) smaller increase on CK values 24 h (LLLT = 272 IU/l; placebo = 498 IU/l; P = 0.020) and 48 h (LLLT = 436 IU/l; placebo = 1328 IU/l; P < 0.001) post-exercise; (3) smaller decrease on MVC immediately after exercise (LLLT = 189 Nm; placebo = 154 Nm; P = 0.011), and 24 h (LLLT = 249 Nm; placebo = 205 Nm; P = 0.004) and 48 h (LLLT = 267 Nm; placebo = 216 Nm; P = 0.001) post-exercise compared with the placebo group. In conclusion, LLLT treatment before eccentric exercise was effective in terms of attenuating the increase of muscle proteins in the blood serum and the decrease in muscle force.

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