Abstract

Background: The effectiveness of low-level laser therapy in muscle regeneration is still not well known. Objective: To investigate the effects of laser irradiation during muscle healing. Method: For this purpose, 63 rats were distributed to 3 groups: non-irradiated control group (CG); group irradiated at 10 J/cm² (G10); and group irradiated at 50 J/cm² (G50). Each group was divided into 3 different subgroups (n=7), and on days 7, 14 and 21 post-injury the rats were sacrificed. Results: Seven days post-surgery, the CG showed destroyed zones and extensive myofibrillar degeneration. For both treated groups, the necrosis area was smaller compared to the CG. On day 14 post-injury, treated groups demonstrated better tissue organization, with newly formed muscle fibers compared to the CG. On the 21st day, the irradiated groups showed similar patterns of tissue repair, with improved muscle structure at the site of the injury, resembling uninjured muscle tissue organization. Regarding collagen deposition, the G10 showed an increase in collagen synthesis. In the last period evaluated, both treated groups showed statistically higher values in comparison with the CG. Furthermore, laser irradiation at 10 J/cm² produced a down-regulation of cyclooxygenase 2 (Cox-2) immunoexpression on day 7 post-injury. Moreover, Cox-2 immunoexpression was decreased in both treated groups on day 14. Conclusions: Laser therapy at both fluencies stimulated muscle repair through the formation of new muscle fiber, increase in collagen synthesis, and down-regulation of Cox-2 expression.

Keywords

Collagen, cryolesion, cyclooxygenase 2, inflammation process, low-level laser therapy, physical therapy.