Steroids block the anti-inflammatory effect of Low Level Laser Therapy

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Interventions with anti-inflammatory actions such as steroids and nonsteroid anti-inflammatory drugs are frequently used in the treatment of rheumatic and musculoskeletal pain. Recent studies from ours and other research groups have shown that low level laser therapy (LLLT) also has an anti-inflammatory effect. Clinical LLLT-studies have produced less homogeneous results, and non-optimal LLLT-dosage has been identified as a key factor for this. However, poor clinical results may also caused by pharmacological co-interventions that block the antiinflammatory effect of LLLT. In the present study, we used the classical experimental mice-model of carrageenan-induced pleurisy, to investigate if the anti-inflammatory effect of low power laser therapy could be blocked by the steroid agent mifepristone. For the intervention group, mifepristone was injected into the pleural cavity an hour prior to the carrageenan injection. Pleurisy was then induced by an intrathoracic injection of carrageenan (0.5mg/cavity), or LPS from E. coli (250 ng/ cavity) in mice. Laser irradiation (650 nm) was then carried out three times with hourly intervals at the skin of the injection site for both groups. LLLT was administered with a previously established optimal accumulated dose of 7.5 J/cm2. While LLLT after 4 hours effectively reduced inflammation almost to pre-injection levels of neutrophil cell counts (1.11_10 (6), [95% CI: 0.41-1.82]), the anti-inflammatory effect was blocked after pre-injection of mifepristone (5.94_10(6), [95% CI: 4.83-7.04]). The implications of these findings are that steroid therapy should be avoided in conjunction with LLLT, and that clinical LLLT-studies violating this precaution, should be excluded from reviews and meta-analyses of LLLT.