## A topical menthol analgesic is more effective than ice for decreasing DOMS-induced pain and increasing titanic force

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Pain can adversely affect muscle rehabilitation by inhibiting muscle contractions. Delayed onset muscle soreness (DOMS) was used to ascertain whether a topical menthol-based analgesic or ice was more effective at reducing pain and permitting greater voluntary and evoked force. Contralateral grip strength was evaluated for possible radiating effects of ipsilateral muscle pain. Using a counterbalanced randomized design, two groups of eight subjects were assigned to menthol-based analgesic and ice groups. DOMS was induced in the non-dominant biceps brachii. Two days later, DOMS discomfort was treated with a menthol based analgesic or ice. Isometric evoked tetanic (non-dominant arm) and maximum voluntary contractions (MVC) of the dominant and non-dominant arms were evaluated before and after DOMS, and 5 and 20 minutes following the treatment. Pain perception was evaluated with a visual analogue scale. DOMS decreased ($p = 0.04$) MVC force 17.1% post-DOMS with no treatment effect. Tetanic force was 116.9% higher ($p<0.05$) with the topical analgesic than ice. Pain perception post-DOMS was significantly ($p=0.02$) less with the topical analgesic versus ice. Contralateral grip strength declined 6.1% from pre- to post-DOMS ($p = 0.006$), and 7.8% five min post intervention compared to pre-DOMS. Compared to ice, the topical menthol-based analgesic decreased perceived discomfort to a greater extent and permitted greater tetanic forces to be produced post-DOMS. The discomfort associated with unilateral DOMS adversely affected contralateral force output indicating a supraspinal crossover effect of pain perception.