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File: ■ Arnica (*Arnica montana*)
■ Pain Relief
■ Post-eccentric Exercise

HC 101312-490

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RE: Topical Application of Arnica Gel May Provide Pain Relief Three Days Post-eccentric Exercise in Men

Pumpa KL, Fallon KE, Bensoussan A, Papalia S. The effects of topical arnica on performance, pain and muscle damage after intense eccentric exercise. *Eur J Sport Sci*. 2013; [epub ahead of print]. doi: 10.1080/17461391.2013.829126.

Arnica (*Arnica montana*) flowers and roots are used as an anti-inflammatory agent to treat a variety of conditions including muscle and cartilage pain. Arnica is used as an ointment for the skin or as a homeopathic remedy that is consumed orally. Studies on the use of arnica for sore and aching muscles are limited and inconsistent. Therefore, the aim of this randomized, double-blind, placebo-controlled trial was to determine if topical arnica effectively reduced pain, indicators of inflammation and muscle damage, as well as improved performance of well-trained males experiencing delayed onset muscle soreness (DOMS).

The study took place at the Australian Institute of Sport in Canberra, Australia. A total of 20 males from a variety of sports participated (mean age: 25.3 ± 6.6 years; mean weight: 76.4 ± 9.8 kg; mean height: 177.3 ± 7.8 cm; maximal aerobic activity [VO_2 Max]: 50.8 ± 6.2 ml/kg min). All subjects were free from injuries, conditions related to inflammation, and did not consume anti-inflammatory medications a month prior to the study.

The subjects were matched based on their VO_2 Max before they completed a downhill treadmill running protocol that induced DOMS and muscle damage. This protocol consisted of 5 bouts of 8 minutes of running at a -10% gradient with 2 minutes of walking comfortably on a flat surface between bouts. Each matched pair was randomly assigned to the placebo or to the treatment group. The treatment involved topically applying arnica gel (Brauer Natural Medicine; Tanunda, Australia) that was 2 cm in diameter and weighed 2.5 g (equivalent to 25 mg dried flowering herb). The gel for the placebo group was identical in color, smell, and texture. The gels were applied to the skin of the quadriceps and gastrocnemius immediately after finishing the protocol to induce DOMS and then every 4 hours while the subject was awake for the duration of the study (up to 96 hours).

Subjects recorded the date and time of each application. The outcomes measured at the end of this study were pain by the visual analogue scale (VAS); muscle tenderness (tested with algometer); performance assessed by the maximum power output of the quadriceps, countermovement jumps (CMJ), and squat jumps (SJ); and markers of inflammation and

muscle damage: interleukin-1beta (IL-1β), interleukin-6 (IL-6), tumor necrosis factor-alpha (TNF-α), high-sensitivity C-reactive protein (CRP), myoglobin (MYO), and creatine kinase (CK).

At baseline, TNF-α was significantly higher in the placebo group (P=0.048) and muscle tenderness (gastrocnemius) was significantly higher in the treatment group. Average compliance for the study was 88.3% (range: 61% to 116%). The only significant change found for performance was a significant decrease in the left leg of placebo subjects at 24 hours after the downhill run (P=0.013). There was also a non-significant decrease in CMJ, SJ, and maximal power output in both groups after the downhill run.

The treatment showed a significant increase in pain based on the VAS after 4, 24, and 48 hours in comparison to baseline (P<0.05) and in the placebo group after 4, 24, 48, and 72 hours (P<0.05). There were no differences found between groups at any of these time points. However, the treatment group had significantly lower mean muscle tenderness in the quadriceps at 72 hours compared to the placebo group (P=0.045) and at 72 and 96 hours compared to baseline (P<0.05). Moreover, significant differences were identified in pain in the gastrocnemius at baseline, post (immediately after), 24, and 72 hours when comparisons were made between the groups (P<0.05), and at 72 and 96 hours for the treatment group in comparison to the baseline values (P<0.05).

CK was significantly increased compared to baseline at 4 and 24 hours in the placebo group (P<0.01) and the treatment group (P<0.001) for both times points. MYO was significantly increased compared to baseline at 4 hours in both the treatment group (P<0.001) and the placebo group (P<0.001). A significant increase in CRP was found in the placebo group at 24 hrs in comparison to baseline (P=0.001). It was also found that there was a significant increase in IL-6 for both groups compared to baseline immediately after the downhill run and after 4 hours (P<0.001). No significant changes were found for IL-1β. Moreover, no significant changes were identified between groups at all time points for CK, MYO, CRP, or IL-6. A significant increase in TNF-α was identified in the treatment group (P=0.002) and in the placebo group (P=0.02) from baseline to post. However, no significant differences were found between the groups when assessing changes from baseline.

The authors conclude that topical arnica may provide pain relief after 72 hours of eccentric exercise, but did not improve performance, markers of muscle damage, or inflammation. This study indicated that the pain perception period was shorter for the subjects treated with arnica. In contrast, a similar study indicated that there were no significant differences in muscle pain after exercise for those treated with arnica or a placebo.[1] The authors suggest it might be worth investigating the benefits of arnica gel when it is used prior to induction of DOMS. Overall, larger trials are warranted that explore the benefits of topical arnica for pain, performance, muscle damage, or inflammation associated with DOMS.

—Laura M. Bystrom, PhD

Reference

[1]Adkison JD, Bauer DW, Chang T. The effect of topical arnica on muscle pain. *Ann Pharmacother*. 2010;44(10):1579-1584.

The American Botanical Council has chosen not to include the original article.