

Dillon Cleary, MD;
Samuel Burton, MD;
Brock Cardon, MD
Nellis Family Medicine
Residency, Nellis Air Force
Base, NV

DEPUTY EDITOR
Shailendra Prasad,
MBBS, MPH
University of Minnesota
North Memorial Family
Medicine Residency
Program, Minneapolis
doi: 10.12788/jfp.0403

Time to consider topical capsaicin for acute trauma pain?

Topical capsaicin is more effective than topical piroxicam at reducing pain in acute upper extremity injuries.

PRACTICE CHANGER

Use topical capsaicin gel 0.05% for pain reduction in patients with isolated blunt injuries of the upper extremity without fracture.

STRENGTH OF RECOMMENDATION

B: Based on a single randomized controlled trial (RCT)¹

Kocak AO, Dogruyol S, Akbas I, et al. Comparison of topical capsaicin and topical piroxicam in the treatment of acute trauma-induced pain: a randomized double-blind trial. *Am J Emerg Med.* 2020;38:1767-1771.

ILLUSTRATIVE CASE

A 23-year-old man with no significant past medical history presents to an urgent care center after a fall on his right arm while playing football. He reports a pain level of 6 using the visual analog scale (VAS). Physical exam reveals minor erythema and edema of his forearm with pain to palpation. Range of motion, strength, and sensation are intact. No lacerations are present. His vital signs are normal. No fracture is found on imaging. The physician decides that treatment with a topical analgesic is reasonable for this uncomplicated contusion of the right forearm. Is there a role for topical capsaicin in the treatment of this patient's pain?

Topical nonsteroidal anti-inflammatory drugs (NSAIDs) are effective for the treatment of acute non-low back pain musculoskeletal injuries.² They are generally well tolerated and just as effective as oral NSAIDs or acetaminophen for localized injuries. Their ubiquitous availability, affordability, and low adverse effect profile make them

an attractive first-line treatment option for acute musculoskeletal pain.

Capsaicin, a topical agent derived from a genus of red peppers, has been used for the treatment of neuropathic and chronic pain via its interactions with substance P, transient receptor potential vanilloid subtype 1 (TRPV1), and nociceptive nerve fibers.^{3,4} It has demonstrated effectiveness in the management of diabetic neuropathy, knee osteoarthritis, and postherpetic neuralgia, as well as various causes of pruritus.^{5,6}

Although many studies have compared oral and topical NSAIDs, opiates, and acetaminophen, few studies have directly compared topical NSAIDs and capsaicin. This study compared the topical NSAID piroxicam with topical capsaicin.

STUDY SUMMARY

Topical capsaicin demonstrated superior pain reduction

This prospective, double-blind RCT compared the efficacy of topical capsaicin vs topical piroxicam for the treatment of acute pain following upper extremity blunt trauma. Patients (ages ≥ 18 years) who presented to a Turkish emergency department within 2 hours of upper extremity injury were randomized to receive either 0.05% capsaicin gel (n = 69) or 0.5% piroxicam gel (n = 67). Patients reported level 5 or higher pain on the VAS. Those with fractures, dislocations, skin disruption, or other trauma were excluded. Age, gender, pain duration, and mechanism of injury did not differ significantly between study groups.¹

Blinding was ensured by placing the gels in opaque containers containing 30 mg of either capsaicin or piroxicam and dyeing the medicine with red and yellow food coloring. A thin layer of medication was applied to an area no larger than 5 × 5 cm on the upper extremity and rubbed for 1 minute. Patients were observed in the emergency department for 2 hours and discharged with instructions to apply the medication 3 times daily for 72 hours.

The investigators measured pain using VAS scores at 1 hour, 2 hours, 24 hours, and 72 hours after treatment. Topical capsaicin was superior to topical piroxicam at achieving both primary outcomes: a VAS score of ≤ 4 (85.5% vs 50.7%; number needed to treat [NNT] = 2.9; $P < .001$) and a > 50% reduction in VAS score (87% vs 62.7%; NNT = 4.1; $P < .01$) at the end of treatment.¹ (These outcomes were based on earlier determinations of the minimal clinically important difference.^{7,8})

Additionally, capsaicin was more effective than piroxicam at each time interval. This difference was most pronounced at 72 hours, with a mean difference of delta VAS scores of 1.53 (95% CI, 0.85-2.221) and a mean percentage of the reduction in VAS scores of 19.7% (95% CI, 12.4%-27.2%) ($P < .001$).¹

Reported adverse effects, such as burning, itching, and rash, were mild and infrequent and showed no significant difference between the treatment groups.

WHAT'S NEW

First study comparing topical capsaicin and a topical NSAID in acute trauma

Although both capsaicin and topical piroxicam have proven efficacy for the treatment of pain, this RCT is the first study to directly compare these agents in the setting of acute upper extremity blunt trauma. Capsaicin is currently more commonly prescribed as a treatment for chronic neuropathic pain.^{4,9} In this study, capsaicin demonstrated superior results in pain

reduction at each assessed time interval and at the primary end point of 72 hours.

CAVEATS

Limited generalizability to lower extremity and truncal trauma

This RCT included a relatively small sample size (136 patients). Researchers evaluated only blunt upper extremity injuries; as such, the generalizability of the effectiveness of topical capsaicin in blunt lower extremity and truncal trauma is limited, especially over larger surface areas.

CHALLENGES TO IMPLEMENTATION

No major challenges found

There are no major challenges to implementing this inexpensive treatment. **JFP**

Copyright © 2022. The Family Physicians Inquiries Network. All rights reserved.

References

1. Kocak AO, Dogruyol S, Akbas I, et al. Comparison of topical capsaicin and topical piroxicam in the treatment of acute trauma-induced pain: a randomized double-blind trial. *Am J Emerg Med.* 2020;38:1767-1771. doi: 10.1016/j.ajem.2020.05.104
2. Busse JW, Sadeghirad B, Oparin Y, et al. Management of acute pain from non-low back, musculoskeletal injuries: a systematic review and network meta-analysis of randomized trials. *Ann Intern Med.* 2020;173:730-738. doi: 10.7326/M19-3601
3. Chrubasik S, Weiser T, Beime B. Effectiveness and safety of topical capsaicin cream in the treatment of chronic soft tissue pain. *Phytother Res.* 2010;24:1877-1885. doi: 10.1002/ptr.3335
4. Derry S, Moore RA. Topical capsaicin (low concentration) for chronic neuropathic pain in adults. *Cochrane Database Syst Rev.* 2012(9):CD010111. doi: 10.1002/14651858.CD010111
5. Simpson DM, Robinson-Papp J, Van J, et al. Capsaicin 8% patch in painful diabetic peripheral neuropathy: a randomized, double-blind, placebo-controlled study. *J Pain.* 2017;18:42-53. doi: 10.1016/j.jpain.2016.09.008
6. Papoiu ADP, Yosipovitch G. Topical capsaicin. The fire of a 'hot' medicine is reignited. *Expert Opin Pharmacother.* 2010;11:1359-1371. doi: 10.1517/14656566.2010.481670
7. Kulkantrakorn K, Lorsuwansiri C, Meesawatson P. 0.025% capsaicin gel for the treatment of painful diabetic neuropathy: a randomized, double-blind, crossover, placebo-controlled trial. *Pain Pract.* 2013;13:497-503. doi: 10.1111/papr.12013
8. Kocak AO, Ahiskalioglu A, Sengun E, et al. Comparison of intravenous NSAIDs and trigger point injection for low back pain in ED: a prospective randomized study. *Am J Emerg Med.* 2019;37:1927-1931. doi: 10.1016/j.ajem.2019.01.015
9. Derry S, Rice ASC, Cole P, et al. Topical capsaicin (high concentration) for chronic neuropathic pain in adults. *Cochrane Database Syst Rev.* 2017;1(1):CD007393. doi: 10.1002/14651858.CD007393.pub4

> Topical capsaicin is an effective alternative to a topical NSAID in reducing pain associated with acute upper extremity injuries.



Visit us @ jfponline.com

THE JOURNAL OF
**FAMILY
PRACTICE**