Are Topical Nonsteroidal Anti-Inflammatory Drugs Useful for Analgesia in Patients With Traumatic Corneal Abrasions?

TAKE-HOME MESSAGE

There is no strong evidence to suggest that topical nonsteroidal anti-inflammatory drugs provide adequate analgesia for patients with traumatic corneal abrasions, yet there is low-quality evidence to suggest that the drugs decreased the need for oral analgesia 24 hours later.

METHODS

DATA SOURCES

The authors searched the Cochrane Central Register of Controlled Trials, EMBASE, and the Latin American and Caribbean Health Sciences Literature Database from database inception until March 2017. They also searched for gray literature and current trials through OpenGrey, ZETOC (Z39.50-compliant access to the British Library's electronic table of contents), the International Standard Randomised Controlled Trial Number registry, ClinicalTrials.gov, and the World Health Organization International Clinical Trials Registry Platform in March 2017.

STUDY SELECTION

Studies were included if they were randomized controlled trials comparing topical nonsteroidal anti-inflammatory drugs with placebo or any alternative analgesic in adults with corneal abrasions. The primary outcomes were patient-reported pain reduction greater than 30% or more and 50% or more after 24 hours. The secondary outcomes of the review

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Editor's Note: This is a clinical synopsis, a regular feature of the *Annals'* Systematic Review Snapshot (SRS) series. The source for this systematic review snapshot is: **Wakai A, Lawrenson JG, Lawrenson AL, et al. Topical non-steroidal anti-inflammatory drugs for analgesia in traumatic corneal abrasions. *Cochrane Database Syst Rev.* 2017;5:CD009781.**

Results

Study	No. of Studies (Patients)	Risk Ratio (95% CI)	I^2, %
Need for rescue analgesia at 24 h	4 (481)	0.46 (0.34–0.61)	0
Complications	6 (609)	0.44 (0.07–2.96)	0

CI, Confidence interval.

Topical nonsteroidal anti-inflammatory drugs versus placebo or standard of care to reduce the use of rescue oral analgesics at 24 hours or complications.

The initial search identified 331 unique articles, and 9 met the inclusion criteria and underwent a full review for analysis in the review. None of the included studies reported the primary outcome. Four studies reported the use of rescue analgesia at 24 hours and showed a reduction in the use of rescue oral analgesics (Table). Of these, 3 studies had a low to unclear risk of bias, and 1 study had a high to unclear risk of bias. All 4 of the included studies for this outcome were classified as low-quality evidence with Grading of Recommendations Assessment, Development and Evaluation methodology. One study reported the

included the use of rescue analgesia after 24 hours, the frequency of healing at 24 and 48 hours after injury, whether the use of concurrent topical antibiotics (drops or ointments) with additional lubricating effects reduced pain, and the complications of corneal abrasions through the use of topical nonsteroidal anti-inflammatory drugs versus the control groups.

DATA EXTRACTION AND SYNTHESIS

Two reviewers independently assessed the articles for eligibility, performed data extraction, assessed risk of bias by the Cochrane Risk of Bias Tool,[1] and determined the quality of the studies with Grading of Recommendations Assessment, Development and Evaluation methodology.[2] Any disagreement was resolved by an additional reviewer. Data were pooled with a random-effects model unless there were 3 or fewer trials for the outcome. Heterogeneity for the appropriateness of pooling data was assessed with the I^2 statistic.

frequency of healed corneal abrasions at 24 and 48 hours after injury. None of the included studies reported the use of rescue analgesia at 48 or 72 hours after corneal injury.

Six studies reported complications of corneal abrasion as an outcome, with 4 reporting no complications in either the topical nonsteroidal anti-inflammatory drug or control study arms. The pooled risk ratio for topical nonsteroidal anti-inflammatory drugs to prevent complications of corneal abrasion was 0.44 (95% confidence interval 0.07 to 2.96). Five of these studies had a low to unclear risk of bias, and one had a high to unclear risk of bias. The quality of evidence was rated as very low.

Commentary

Corneal abrasions are among the most common ophthalmologic presentations in the outpatient[3] and emergency department (ED)[4] setting. Most corneal abrasions heal within 48 hours, but patients can experience significant pain and other uncomfortable sensations during the healing period.[5] There is no consensus on how analgesia for corneal abrasions should be managed in the ED, and there appears to be no universally accepted approach on the use of topical or oral nonsteroidal anti-inflammatory drugs.[6]

This review attempted to study whether there was evidence among the available randomized controlled trials that topical nonsteroidal anti-inflammatory drugs could provide at least a 30% reduction in pain within 24 hours and at least a 50% reduction in pain after 24 hours. This outcome was based on a previous article that determined that the minimum clinically important difference in patient-reported pain intensity was 30% according to a visual analog scale.[7] Unfortunately, no studies were found to address this outcome. An important limitation of this study is the absence of a measure of the time to healing of corneal abrasion. Consideration of this clinically important outcome would affect the use of rescue analgesia and pain reduction among the included studies.

However, this review provides some evidence that the use of topical nonsteroidal anti-inflammatory drugs may reduce rescue analgesia at 24 hours. This evidence should be applied with caution because of the low quality and unclear risk of bias among the studies reporting this outcome. Furthermore, these studies used unique comparators. The studies used a topical nonsteroidal anti-inflammatory drug and topical antibiotic versus a topical antibiotic alone,[8] a topical nonsteroidal anti-inflammatory drug and ophthalmic antibiotic ointment versus topical polyvinyl alcohol and an ophthalmic antibiotic ointment,[9] a topical nonsteroidal anti-inflammatory drug versus topical polyvinyl alcohol,[10] and a topical nonsteroidal anti-inflammatory drug versus topical polyvinyl alcohol, with topical antibiotics being used at the discretion of the clinician in both trial arms.[11] Topical nonsteroidal anti-inflammatory drug use for corneal abrasion is not Food and Drug Administration approved, and its use for this condition is off label. Therefore, only short courses of topical nonsteroidal anti-inflammatory drugs should be prescribed to patients with corneal abrasion who are able to obtain early follow-up evaluation after ED discharge. Finally, there is currently very limited evidence to suggest the best treatment approach for corneal abrasions other than topical antibiotics initiated the ED. Eye patching[12] and ocular topical anesthetics[13] have been studied as supplemental treatments, and neither has been shown to improve healing or reduce pain, according to nonhigh-quality studies.

This review suggests there is no strong evidence to support the use of topical nonsteroidal anti-inflammatory drugs for traumatic corneal abrasions. Further trials

with low risk of bias that use clinically significant and evidence-based outcomes are needed before topical nonsteroidal anti-inflammatory drugs can be recommended as first-line agents for pain caused by traumatic corneal abrasions.

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