



## Article Appraisal

Article: Topical Tetracaine Used for 24 Hours Is Safe and Rated Highly Effective by Patients for the Treatment of Pain Caused by Corneal Abrasions: A Double-blind, Randomized Clinical Trial.

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Background and Study Objective(s)	Corneal abrasions are a common and painful reason for ED visits; tetracaine is effective analgesia for these injuries but is contraindicated for treatment outside of the ED. Evidence demonstrating harm is based solely on animal studies, and case studies generally of prolonged, unsupervised use of tetracaine. Moreover, there is some evidence to indicate tetracaine is effective and safe and with short-term use after laser-eye surgery. The objective of this study was to evaluate the safety and efficacy of topical tetracaine for uncomplicated corneal abrasions
Study Design	This was a prospective, double-blind, randomized, controlled trial of a convenience sample of patients with simple uncomplicated corneal abrasions. Corneal abrasions at high risk of infection or complication were excluded. Block randomization of participants to either tetracaine or normal saline drops was performed. The primary outcome was safety based on persistent fluorescein uptake of the corneal abrasion at 48 hours and the occurrence rates of any complications. Secondary outcomes included pain reduction on a 100-mm VAS & patient perceived effectiveness.
Results	Baseline characteristics of both groups were similar. 122 patients were recruited; 93 were analyzed. For the primary outcome, healing at 48 hours, there was no difference between the groups ( $p=0.761$ ). No complication was seen in either group at one month. There was no clinically significant difference in pain scores at any given time, however patients did rate tetracaine as significantly more effective than normal saline ( $p < 0.0005$ ).
Validity of Results	<p>The authors used an unconventional method to calculate their sample size calling into question their power to detect complications. Moreover there is much missing data; only 70% of participants attended their 48-hour follow-up and 83% and 89% were contacted at one week and one month respectively. 85 returned pain questionnaires. The authors do not explain how they handled missing data nor did they perform a sensitivity analysis. In terms of blinding, all patients initially received tetracaine in ED and likely either recognized the sting of the eye drops (or lack thereof) on subsequent treatments. Treating MDs could also have easily become unblinded by asking patients on follow-up if their eyedrops stung.</p> <p>No difference in pain scores was seen at any time, which the authors explain by a "stoic" group of patients who may not have wanted to complain about pain. Yet, no data on compliance was collected. Therefore, by the same logic this "stoic" group may not have even taken the medication and the difference in effectiveness can be explained by social desirability bias. Finally, many of the listed complications of tetracaine treatment would not have developed in 48 hours and the MDs completing the follow-up exam were not corneal experts nor did they have sophisticated devices to detect said complications.</p>
Generalizability of Results	<p>This study was performed in a farming community in New Zealand and may not be applicable to an urban, North American population.</p> <p>Topical antibiotics were received by study participants but are not standard treatment everywhere and may have masked delayed healing and secondary infection from tetracaine</p>
The Bottom Line	Based on this study alone, we cannot comment on the safety or efficacy of this drug. However, the rationale behind not giving tetracaine to patients with uncomplicated corneal abrasions is based on case studies alone; we routinely trust patients with likely more dangerous medications.