Case Report

Dilute Proparacaine

Urgent message: The use of dilute proparacaine appears to be a safe and cost-effective way to treat the pain associated with many acute corneal injuries.

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Editor's Note: This article deviates from our typical case report format to underscore one of the key points for management of eye conditions discussed in this month's cover story.

Introduction

Ocular injuries are often painful and can cause significant suffering. Many medical practitioners provide immediate, but temporary relief with the use of proparacaine ophthalmic drops. Given the potential toxicity of this medication, practitioners rarely dispense these medications for home use but rather, opt to provide systemic analgesia, often with narcotic pain medication. There are numerous disadvantages to systemic narcotic analgesia as well as questionable efficacy in these conditions. Therefore, the age-old concerns for home use of proparacine are being challenged and alternatives explored.

The use of dilute proparacaine appears to be an effective, affordable and safe short-term treatment option for patients with acutely painful ocular conditions, including, but not limited to corneal abrasions and post foreign body removal.

Proparacaine ophthalmic solution at 0.5% concentration is available as a generic medication. The retail cost is approximately $15 (and often less than $7 through medical supply companies) for a 15-mL bottle. This topical anesthetic solution instilled in the eye provides short-term analgesia by inhibiting the sodium ion channels and therefore inhibiting the nerve impulse initiation and conduction. The onset of pain relief is rapid, within 30 seconds, and the duration of analgesia varies from 15 to 45 minutes or more. The most common adverse reaction is mild and temporary stinging immediately after instillation. Serious adverse reactions include hypersensitivity reaction, corneal ulceration and/or opacification (prolonged use), potential for delayed ocular wound healing, and epithelial keratopathy. The only listed contraindication known is hypersensitivity to any component of the solution.[1]

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Literature review

One of the earlier studies published in *Ophthalmology* in 1997 (L. Shahinian, Jr et al), found that proparacaine in dilute concentration to 0.05% was effective and nontoxic for use up to 1 week post-photorefractive keratectomy.[2] The authors noted no affect on healing nor any significant adverse reactions.

A more recent study published in 2010 in *The Canadian Journal of Emergency Medicine* (I. Ball, MD et al) involved 33 patients, which of whom received the dilute proparacaine (at the concentration of 0.05%), had pain

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relief.[3] The authors reported no incidence of associated ocular injury nor adverse outcome from the medication.

Case Presentation

Given the potential to reduce the often significant pain associated with acute ocular injury, we conducted a similar informal study.

Our selection criteria were patients with acute corneal injuries who had no contraindication to use of dilute proparacaine solution. After detailed discussion about the risks and benefits with each patient, they were entered into our study log for follow up. Following the dilution guideline already studied, we used proparacaine 0.5% and diluted it with normal saline to 0.05% concentration, placing it into a sterile glass vial with a dropper top for each patient. We dispensed enough medication, calculated by volume and directions for use, for a 48-hour supply with the following directions*: 1 – 2 drops in affected eye every one hour as needed for pain*. Before dispensing the medication, the patients were required to an sign informed consent and waiver form and agree to a 2-day follow up recheck.

Observation and findings

- A total of 24 patients received the dilute proparacaine.
- A total of 13 patients returned within 48 hours for a recheck.
- The total number of telephone follow-ups was 3.
- The total number of patients who failed to return to the clinic or return telephone follow-up was 8.

Overall, 67% of patients followed up and 100% of them were asymptomatic at the time of follow up. All reported a reduction in pain and tolerated the dilute proparacaine well without adverse sequela.

Discussion

Our small, informal study demonstrates encouraging patient data, adding to the argument that dilute proparacaine is a safe, effective, and inexpensive option to treat the pain associated with many acute corneal injuries and should be considered as an alternative to systemic narcotic medication. ■

REFERENCES

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