TAKE-HOME MESSAGE

There is inadequate evidence to support or discourage the combination of epinephrine with lidocaine for digital nerve blocks.

METHODS

DATA SOURCES

The authors searched the Cochrane Central Register of Controlled Trials (Issue 11, 2014), MEDLINE (1966 to November 18, 2014), and EMBASE (1980 to November 18, 2014). In addition, they searched Web sites, including http://www.indmed.nic.in, http://www.cochrane-sadcct.org, and http://www.clinicaltrials.gov.

STUDY SELECTION

All randomized controlled trials on adult patients comparing the use of lidocaine with epinephrine (ie, adrenaline) to plain lidocaine in emergency and elective surgeries on fingers and toes (ie, digits) were reviewed. Studies that used other adjuvant agents with lidocaine or the use of other anesthetic techniques or procedures were excluded. In addition, studies with quasi randomization, those with cluster randomization, and crossover trials were excluded. The primary outcomes included anesthesia duration, adverse events, and cost analysis. Secondary outcomes were time to postoperative pain relief and reduction of bleeding during surgery.

DATA EXTRACTION AND SYNTHESIS

Two authors independently screened studies for inclusion, extracted data, and assessed risk of bias. Disagreements were resolved by discussion and consensus. Study bias was assessed with the

Should I Use Lidocaine With Epinephrine in Digital Nerve Blocks?

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Results

Results of studies comparing lidocaine with epinephrine to lidocaine without epinephrine for digital nerve blocks.

Outcomes	Number of Studies (Number of Patients)	Summary Results	Quality of Evidence (GRADE)*
Anesthesia duration	1 (20)	MD 3.2 h longer in epi group (95% CI 2.5–3.9 h)	Low[†]
Reduction of bleeding during procedure[‡]	2 (103)	RR of bleeding in the epi group=0.35 (95% CI 0.2–0.7)	Low[§‖]

GRADE, Grades of Recommendation, Assessment, Development and Evaluation; *MD*, mean difference; *epi*, epinephrine; *CI*, confidence interval, *RR*, risk ratio.
*GRADE scale=high, moderate, low, and very low.
[†]Method of randomization and blinding not mentioned.
[‡]Subjective reporting by surgeon of increased or decreased bleeding.
[§]Methods of randomization and allocation unclear; imprecision.
[‖]Selection and detection bias.

Of the 1,164 identified studies, only 4 met inclusion criteria for analysis, which included 167 patients. None of the studies were deemed to be high quality according to risk-of-bias analysis. Three studies used epinephrine with lidocaine concentration 1:100,000, whereas 1 used 1:200,000. Only 1 study reported prolonged anesthesia duration with epinephrine with lidocaine, and 2 studies demonstrated a reduction of bleeding during surgery. No studies reported any adverse events (eg, digital ischemia) in the lidocaine with epinephrine group.

Commentary

Digital nerve blocks are common procedures in the emergency department (ED). The use of lidocaine with epinephrine offers the potential benefits of a bloodless field and prolonged anesthesia time because of vasoconstriction. However, it is traditionally taught to avoid using epinephrine with local anesthetic agents in digital nerve blocks because of the potential risk of digital ischemia and necrosis.[1] This well-held convention is taught for other anatomical sites with end artery flow, such as the nose and earlobes.

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risk-of-bias assessment tool, which uses 5 quality domains. If all domains were adequate, the study was deemed low risk of bias. If 1 or more domains were inadequate or unclear, the study was deemed high risk. Quality of evidence was summarized with the Grades of Recommendation, Assessment, Development and Evaluation scale (high, moderate, low, and very low). Statistical heterogeneity was reported with the I^2 statistic. Analysis followed the intention-to-treat principle; risk ratios and mean differences were used to measure treatment effects for dichotomous outcomes and adverse events.

Physicians who routinely use lidocaine with epinephrine in digital nerve blocks must rely on lower-quality evidence to support their practice. In a retrospective chart review of 1,111 digit or hand surgery cases, 611 patients received lidocaine with epinephrine. Of the 986 patients (89%) captured in follow-up, none in the epinephrine group experienced digit necrosis.[2] Another retrospective chart review identified 63 patients who had digit surgery with lidocaine with epinephrine and found no cases of digital ischemia or necrosis.[3] An earlier literature review found 50 cases of digital gangrene reported.[4] Most occurred in the early 20th century; 21 cases used epinephrine, with concentrations reported in only 4 cases (ranging from 1:160,000 to 1:400,000). None of these cases used lidocaine but rather older anesthetics or water, and many had confounding factors (eg, infection, tourniquets). The authors concluded that the literature failed to prove that lidocaine with epinephrine leads to digital necrosis.[4]

Although the current available randomized controlled trial evidence suggests that the addition of epinephrine to lidocaine in digital nerve blocks prolongs anesthesia duration and reduces bleeding during surgery, with low risk of digital ischemia, there is not enough high-quality evidence to recommend or refute the routine use of lidocaine with epinephrine for digital nerve blocks in the ED. Further prospective randomized controlled trials of high methodological quality with patient-centered outcomes are needed to establish the benefits, risks, and best practice recommendations.

Editor's Note: This is a clinical synopsis, a regular feature of the *Annals*' Systematic Review Snapshots (SRS) series. The source for this systematic review snapshot is: **Prabhakar H, Rath S, Kalaivani M, et al. Adrenaline with lidocaine for digital nerve blocks. *Cochrane Database Syst Rev*. 2015;(3):CD010645. http://dx.doi.org/10.1002/14651858.CD010645.pub2.**

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Michael Brown, MD, MSc, and Alan Jones, MD, serve as editors of the SRS series.