

[2003 Fall A19] Topical anesthetics for procedure related dermal pain

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Objective: To provide evidence based review to determine the most effective and safest formulations of topical anesthetics to facilitate dermal related procedures.

Methods: The study was a systemic review of the randomized clinical trials analyzing the efficacy of topical anesthetics for dermal related procedures. Three subsets of procedures were separately evaluated based on the depth of skin layer penetration:

- 1) Repair of open skin wounds or lacerations
- 2) Procedures involving puncture of only the epidermal and dermal layers
- 3) Procedures involving puncture through the deeper sub-dermal skin layers

The MEDLINE and Cochrane Central Register of Controlled Trials electronic databases were searched with a detailed strategy. Inclusion criteria was randomized, placebo controlled trials. Both pediatric and adult patients were considered. Outcome measures were pain-scoring scales including visual analogue scores, verbal pain scores and modified behavioral pain scores. The quality of each trial was assessed to measure the likelihood of bias using a five point grading scale. Data from trials that quantified pain with similar measures was combined and statistically compared with meta-analysis. Non-compatible data was compared qualitatively.

Results: Preliminary results are available for the first section of the study that assessed topical anesthetics for repair of open dermal injuries. Twenty-two trials that randomized almost 3000 patients were found to meet inclusion criteria. Tetracaine-adrenaline-cocaine (TAC) was the first topical anesthetic found to be equivalent to lidocaine infiltration. Subsequent trials revealed that the individual components; TA, T, AC, C were inferior to TAC in it's complete entity. TAC was therefore considered the "standard" to which the other topical agents were compared. Several studies included in the review, compared TAC with lidocaine-adrenaline-tetracaine gel. Each trial concluded that LAT gel was equal or more efficacious than topical TAC. This data was confirmed by a non-blinded trial that concluded LAT gel was significantly better analgesic then lidocaine infiltration as measured by VAS.

In one trial, EMLA was found to be effective compared to TAC. Also, topical lidocaine-epinephrine was found to be a valid substitute for TAC in a single study.

No role was found for most mepivacaine-based topicals. However, one trial that specifically assessed Mepivacaine-adrenaline-cocaine (MAC) found the agent to be comparable to TAC. Several formulations of either an amide or ester anesthetic combined with the vasoconstrictor phenylephrine were analyzed and showed promise.

Conclusion: Although TAC is effective for providing analgesia for open skin wound repair, cocaine free topicals are preferred, because these anesthetics have been found to be safer and less expensive. LAT was conclusively found to be a valid alternative to TAC. Limited data showed that topical lidocaine-epinephrine and EMLA were effective, but the latter probably should not be applied to open wounds until safety in this setting has been proven. Amide and ester topical anesthetics combined with phenylephrine are cost efficient and may be clinically effective, hence warrant further investigation.