Lidocaine-prilocaine cream versus tetracaine gel for procedural pain in children

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Authors' objectives
To determine the relative efficacy of lidocaine-prilocaine and tetracaine for procedural pain in children.

Searching
MEDLINE was searched from 1990 to June 2001 using the keywords 'lidocaine-prilocaine', 'lidocaine', 'prilocaine', 'tetracaine', 'anaesthetics', 'local', 'pain' and 'anaesthesia'. The bibliographies of the retrieved articles were checked for additional studies. Studies reported in any language were considered.

Study selection
Study designs of evaluations included in the review
Study design was not a pre-specified criterion. Randomised controlled trials (RCTs) and one phase-lag design were reviewed.

Specific interventions included in the review
Trials comparing the efficacy or safety of lidocaine-prilocaine and tetracaine for skin anaesthesia were included. In the included studies, the lidocaine-prilocaine dosage ranged from 1 to 2.5 g with and the mean duration of application ranged from 40 minutes to 1.9 hours; the tetracaine dosage was 1 g (information unavailable for one study) and the mean duration of application ranged from 30 minutes to 2 hours.

Participants included in the review
Children aged up to 18 years were included. The age of the children in the included studies ranged from 1 to 16 years. The procedures they underwent were venous cannulation, venipuncture Port-a-Cath puncture and laser treatment.

Outcomes assessed in the review
The included studies used measures of pain. The measures used were the poker chip tool, visual analogue scale, observer distress rating and faces scale. Three studies used patient assessment of pain only, 3 studies used health professional assessment of pain only, and 2 used patient, professional and parent assessment of pain.

How were decisions on the relevance of primary studies made?
Decisions were made independently by two reviewers.

Assessment of study quality
The authors do not state that they assessed validity.

Data extraction
The authors do not state how the data were extracted for the review, or how many of the reviewers performed the data extraction. The data extracted included: citation details, study design, indications for local anaesthesia, treatment dosage, age range of participants, pain assessment tool and assessor, clinical outcomes and adverse effects.

Methods of synthesis
How were the studies combined?
A narrative synthesis was undertaken.

How were differences between studies investigated?
The studies were not pooled in a meta-analysis due to differences in indication for use and outcome measures. The
studies were grouped in the narrative synthesis according to the type of procedure the participants underwent: intravenous cannulation, venipuncture, Port-a-Cath puncture, and laser treatment of port-wine stains.

Results of the review
Eight studies (n=635) were included: 7 RCTs (n=458) and 1 phase-lag design (n=177).

When lidocaine-prilocaine and tetracaine were used as labelled (i.e. lidocaine-prilocaine for one hour and tetracaine for 30 minutes), both drugs had similar analgesic efficacy. In studies where the two anaesthetics were applied for a similar duration of time (40, 60 and 120 minutes), tetracaine was superior to lidocaine-prilocaine. Lidocaine-prilocaine was associated with blanching of the skin, while tetracaine was commonly associated with erythema.

Authors' conclusions
Lidocaine-prilocaine and tetracaine appear to be comparable for procedural pain relief when used as recommended. When both anaesthetics are applied for the same amount of time, tetracaine is more efficacious than lidocaine-prilocaine.

CRD commentary
This review was based on a clearly defined research question. While the literature search had no language restrictions, it was restricted to one database and it is therefore unlikely that all relevant research was identified. In addition, no attempts were made to identify unpublished studies or assess publication bias. A formal assessment of the quality of the included studies was not reported, although the findings of the individual studies were considered in the context of study quality.

Sufficient details of the individual studies were provided, both in the text and in tabular format. Given the clinical heterogeneity identified by the authors, it would seem appropriate that they did not pool the data. However, the narrative pooling was limited, consisting mainly of a description of the individual studies with no overall result by procedure. The authors’ conclusion, that tetracaine is more efficacious than lidocaine-prilocaine when both anaesthetics are applied for the same amount of time, seems somewhat overconfident given the small amount of data and the fact that they have not considered whether this subgroup of studies was homogeneous. The limitations of the literature search and lack of validity assessment also need to be taken into consideration.

Implications of the review for practice and research
The authors did not state any implications for further research and practice.

Bibliographic details

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11918521

Indexing Status
Subject indexing assigned by NLM

MeSH
Administration, Topical; Adolescent; Anesthetics, Local /therapeutic use; Child; Child, Preschool; Gels; Humans; Infant; Lidocaine /therapeutic use; MEDLINE; Ointments; Pain /prevention & control; Prilocaine /therapeutic use; Randomized Controlled Trials as Topic; Tetracaine /therapeutic use

AccessionNumber
Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.