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Cochrane Nursing Care Field – Cochrane Review Summary

Prepared for the

American Journal of Nursing

Topical anaesthetics for pain control during repair of dermal laceration

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- **Background**:

The repair of superficial dermal lacerations is typically a minor procedure performed in an out-patient setting. Wound repair can be invasive, for example the use of sutures or staples, or non-invasive in nature, for example the use of adhesives or glue. Pain management is required with either approach and traditional methods involve the infiltration of the wound with local anaesthetics, and this may be supplemented with systemic analgesics or sedation.

The use of local anaesthetics to manage pain is based on their ability to interrupt the transmission of electrical impulses along sensory nerves by inactivating sodium channels (Stoelting. 1999). However the process of injecting this medication into the skin and subsequent infiltration of tissue can cause discomfort and anxiety in patients, especially in children and those with a needle phobia. Therefore the use of topical agents, for example gels or solutions, to deliver local anaesthetic has been proposed as an alternative (Tayeb et al, 2018). These medications need to be managed carefully as high doses can lead to adverse side effects including hypotension, cardiac arrhythmias, double vision and seizures (Stoelting, 1999).

- **Objective/s:**

This review had three objectives. Firstly to assess whether the benefits of non-invasive topical anaesthetic use are at the expense of decreased analgesic efficacy. Secondly to compare the efficacy of various single or multi component topical anaesthetic agents for the repair of dermal laceration and finally to determine the clinical necessary for topical application of the ester anaesthetic, cocaine.

- **Intervention/Methods:**

The review included randomised controlled trials (RCTs) and quasi-randomised trials, blinding was not an exclusion criteria. Relevant trials that were published in abstract format or were presented at national or international society meetings were also considered.

Trials that evaluated the efficacy of topical local anaesthetics for pain during dermal laceration repair were included, specifically those that compared:

1. Infiltrated local anaesthetic agent and topically applied anaesthetic agents;
2. Different topical local anaesthetic formulations.

Participants included paediatric and adult participants of any age.

The primary outcome measure was participant reported pain intensity during wound repair. The authors included any type of pain intensity scale that was described clearly. Secondary outcome measures considered were indirect predictors of pain intensity during wound repair, for example participants' behavioural responses; and topical anaesthetic related acute toxicity reported shortly after application,

for example neurological and cardiovascular toxicity and other adverse effects such as an allergic reaction.

- ## Results:

In total, 25 studies, representing a total of 3278 participants were included in this review, all of which used a randomized trial design. Of these 25 reported on participants' self-reported pain intensity and 11 on the acute adverse effects of the anaesthetic. The small number of included trials in each comparison group and the heterogeneity of the outcome measures meant that quantitative data analysis was only performed for one outcome measure, pain intensity assessed on a visual analogue scale. Therefore analysis was mostly descriptive in nature. Most trials that compared infiltrated and topical anaesthetic use were at high risk of bias and while all included trials were RCTs, the authors downgraded the overall GRADE score for each outcome measure to low. This was due to limitations in design and implementation, imprecision of results and high probability of publication bias.

- ## Conclusions:

The authors reported that topical anaesthetics may offer an effective and non-invasive method of pain relief for the suturing or stapling of dermal lacerations. While no serious side effects were reported with the use of cocaine–based topical anaesthetics, their continued use was questioned due to the availability, cost effectiveness and comparable efficacy of other topical anaesthetics without cocaine on the market.

- ## Implications for Practice:

Pain is one of the most common fears of patients entering the health care system for treatment and nurses play an important role in pain assessment and management. The injection of local anaesthetic to manage the pain associated with the repair of dermal lacerations can cause discomfort and anxiety in patients, particularly paediatric patients and those with a fear of needles and also risks distorting the wound site to be repaired. Therefore the use of topical agents is preferred, as long as the efficacy in relieving pain is comparable.

References:

Tayeb, BO, Eidelman, A, Eidelman, CL, McNichol, ED & Carr, DB. 2018. Topical anaesthetics for pain control during repair of dermal laceration (Review). *Cochrane Database of Systematic Reviews*, 2018, Issue 1, Art.No: CD005364 DOI: 10.1002/14651858.CD005364.pub3.

Stoelting, R. 1999. Pharmacology and physiology in anaesthetic practice. *Pharmacology and Physiology in Anaesthetic Practice.* Baltimore, MD: Lippincott Williams and Wilkins.