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The use of topical anaesthesia during repair of minor lacerations in Departments of Emergency Medicine: A literature review

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Lidocaine;
Epinephrine;
Minor laceration

Abstract

Background: There are currently a number of different methods available to obtain anaesthesia in minor dermatological procedures. Although intradermal infiltration of 1% lidocaine is the favoured method for anaesthesia induction in laceration repair, it can cause significant pain in itself. Topical anaesthesia has been investigated as an alternative to infiltration anaesthesia, with the majority of studies looking at preparations of either TAC (tetracaine, adrenaline and cocaine) or LAT (lidocaine, adrenaline and tetracaine).

Methods: A computerised search of the literature was undertaken, using Medline, Cinahl and the Cochrane Library, to identify studies of interest to this review. Reference lists were examined for further relevant papers.

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Aims: This paper aims to provide an overview of the use of topical anaesthetics, in laceration repair, in Emergency Medicine (EM) departments.

Conclusion: The literature has shown that the induction of anaesthesia in lacerations has remained largely unchanged over the past few years, with lidocaine infiltration still the preferred method. Many reasons have been put forward as to why topical anaesthetics are not commonly used in the UK. Perhaps it would be beneficial to carry out work in relation to alternative formulations as opposed to overcoming the difficulties associated with formulations that are already available.

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Introduction

Between 2006 and 2007, an estimated 709,329 people attended EM departments in Northern Ireland, with a total of approximately 18.1 million attending EM departments throughout the United Kingdom as a whole (www.statistics.gov.uk). As lacerations are one of the most commonly encountered problems in EM (Hollander and Singer, 1999), it is evident that EM clinicians deal regularly with traumatic wounds. Lacerations occur predominately in young adults, of which 50% occur on the neck and head and 35% are found on upper extremities involving finger and hands (Hollander and Singer, 1999). The most common mechanisms of injury include; application of a blunt force, sharp instruments, glass or wooden objects and bites (Hollander et al., 1995). The Manchester Triage Group state it is acceptable for patients with a non-life threatening laceration to wait up to two hours before they receive final treatment (Manchester Triage Group, 2005), though this is dependent on pain scores. However, as the NHS Plan has set new targets on waiting times, patients should now be seen, treated, discharged, transferred or admitted within four hours of registration to EM departments (Department of Health, 2000). This is forcing clinicians to come up with strategies that will shorten the length of time patients are required to spend in EM departments.

Methods

A computerised search of the literature was undertaken, by two reviewers, using Medline, Cinahl and the Cochrane Library using the search terms "anaesthetics, local", "wounds and injuries" and "administration, topical". Searches were also undertaken incorporating the text words "lacerations", "adrenaline", "epinephrine" and "tetracaine", "cocaine", "lidocaine" and "caines" in general as well as "EMLA" and "ametop". Studies from all dates and of both a qualitative and quantitative nature were included. Studies carried out using both adult and paediatric participants were used in this literature review. Relevant papers were retrieved and the reference lists examined for further articles. This paper aims to provide an overview of the findings of the relevant papers.

Principles of laceration management

The goals of laceration management are simple and have remained the same over the years. These are to avoid infec-

tion and to achieve a functional and aesthetically pleasing scar (Singer et al., 1997). Such goals are achieved typically by reducing contamination, debriding devitalised tissue, restoring perfusion in poorly perfused wounds and establishing a well-approximated skin closure (Hollander and Singer, 1999). If the wound is not appropriately managed, complications can include infection, prolonged convalescence, unsightly and dysfunctional scars and, rarely, mortality (Hollander and Singer, 1999). In order to manage a laceration appropriately, the clinician must take a detailed history from the patient. Accounts of the mechanism of injury, past medical history, time elapsed from injury, allergies and immunisation status are necessary in order to manage and treat a laceration effectively. Pain status must be determined, as pain could be a sign of an underlying fracture. In order to debride devitalised tissue effectively, reduce contamination with good surgical toilet and manipulate the wound to provide a well-approximated closure, the majority of lacerations will require some form of anaesthesia. It should be the primary aim of an emergency clinician to provide effective local anaesthesia with minimal pain and distortion of the tissue planes (Berman et al., 2005; Schechter et al., 2005; Gaufberg et al., 2007).

Anaesthesia of the wound

Appropriate anaesthesia of the wound is a key factor in the treatment of minor lacerations. Currently, a number of methods are available to obtain anaesthesia in lacerations prior to repair. These include intradermal infiltration, field or nerve block and topical anaesthesia (Singer et al., 1997; Hollander and Singer, 1999; Schechter et al., 2005). Topical anaesthesia is of particular interest in this review but others will be mentioned briefly. The dose, length of anaesthetic action and clinical indications for some commonly used anaesthetic agents are shown in Table 1. A number of local anaesthetics have been developed which produce anaesthesia for different durations of time. Although preferences for particular anaesthetic agents in relation to specific procedures do exist, the most commonly used local anaesthetic in the UK is Lidocaine (Lener et al., 1997). As can be seen from Table 1, there are a number of alternatives to the commonly used topical anaesthetics and evidence from a recent review by Eidelman et al. (2005) suggests that these are easier and cheaper to use than some of their more well known alternatives.

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