A study of topical skin analgesics

A randomised, double-blind, placebo-controlled, comparative study of topical skin analgesics and the anxiety and discomfort associated with venous cannulation by A. F. Speirs, K. H. Taylor, D. N. Joanes, and N. M. Girdler
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Objectives

To compare the effect of topical skin anaesthetic agents on the discomfort and anxiety associated with venous cannulation.

Design

Randomised, double-blind, placebo-controlled, within subject, volunteer trial.

Methods

20 healthy volunteers underwent venous cannulation on three separate occasions having received topical skin application of either 4% amethocaine gel (Ametop), 5% eutectic mixture of lidocaine and prilocaine (EMLA) or E45 cream (placebo). Visual analogue and verbal rating scales were used to assess pain and anxiety associated with the venous cannulation, and anticipated anxiety for future cannulation, under each drug condition.

Results

Subjects were aged 22-53 years (mean 32.8 years). The mean visual analogue scores (VAS) scores for discomfort were found to be significantly lower ($p < 0.001$) with Ametop (VAS = 18mm) and EMLA (VAS = 29mm) compared with the control (VAS = 38mm). There was a positive correlation ($R^2 = 72\%$, $p < 0.001$) between discomfort and the predicted anxiety if cannulation was to be repeated with the same cream. With the placebo a positive correlation ($R^2 = 19.8\%$, $p = 0.05$) was found between the level of anxiety before cannulation and the level of discomfort recorded.

Conclusions

Ametop and EMLA topical anaesthetic agents produce effective skin analgesia for venous cannulation. The use of topical analgesia can reduce perceived anxiety about future cannulation procedures. This has application in the management of anxious patients undergoing intravenous sedation, suggesting that topical analgesia prior to venous cannulation may significantly aid anxiolysis.

In Brief

- Both Ametop™ and EMLA™ reduce the discomfort felt during venous cannulation, however with a 45-minute application time, Ametop was found to be more reliable
- The anxiety level before cannulation did not correlate significantly with the level of discomfort experienced
- The delay necessary to allow a topical anaesthetic cream to work did not lead to an increase in anxiety prior to venepuncture in healthy volunteers
- The use of an effective topical skin anaesthetic cream prior to venepuncture may reduce future anxiety prior to similar procedures

Comment

Fear of dental treatment is a major barrier to dental care. Intravenously administered anxiolytic drugs can be immensely effective at relieving that anxiety and permitting dental care to take place, but for many patients, pain and anxiety associated with venous cannulation are themselves a barrier to this form of treatment. This complex, but well designed study has set out to determine the relation between discomfort associated with venous cannulation and anxiety about the process.

This comparison of two commonly used topical skin anaesthetic agents with a non-active placebo cream and the use of both visual analogue and verbal descriptor to measure anxiety and pain has permitted comparison with other studies as well as confirming the relatively efficacy of the agents. The paper gives an extremely

detailed analysis of the statistical methods used, both in study design and in analysis. This will permit ready comparison with both past and potentially future work. The randomised double-blind, placebo-controlled design is sound. The use of healthy volunteers, as in this study, has permitted tightly controlled circumstances for the measurement of pain and anxiety, but this must mean that extrapolation of the results to an extremely anxious population should be undertaken with great care.

The study shows conclusively that the two active topical local anaesthetic creams reduce the discomfort associated with venepuncture and that 4% amethocaine gel is more effective than a 5% eutectic mixture of lignocaine and prilocaine. The study has also shown a close relationship between actual discomfort experienced at cannula-

tion and an anticipated level of anxiety should a similar procedure be performed again. The authors have sought evidence that the level of anxiety, prior to cannulation was predictive of the actual pain experience, but have not found such evidence. They did, however, find a close relation between verbal descriptors and visual analogue measurements for both pain and anxiety. This should be a very valuable aspect of the study in making comparisons with other work.

It will be interesting to see how these data translate for dental phobic patients and to actual levels of anxiety reported during repeated treatment, but such data will have to await further study.

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