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Local anaesthetic cream for the alleviation of pain during venepuncture in Tanzanian schoolchildren

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The analgesic effect and the usefulness of EMLA cream 5% in connection with venous blood-sampling was investigated in 42 Tanzanian schoolchildren. Approximately 2.5 g EMLA was applied to the right cubital fossa for a minimum of 120 min. The analgesic effect was pronounced—93% of the venepunctures were pain-free and no child experienced severe pain. No adverse reactions were observed and the children could continue normal school work during the application time.

Keywords local anaesthesia EMLA venepuncture black children pain

Introduction

In clinical studies it is often necessary to perform venous punctures when large blood samples are required. This could be painful for the participants and may, particularly in children, lead to withdrawal from the study if the sampling is repeated.

EMLA cream 5% produces superficial dermal analgesia. Several studies in hospitalized children have proved its efficacy in reducing pain in connection with the insertion of venous cannulas (Maunuksela & Korpela, 1986; Manner *et al.*, 1987) or venepuncture (Kurien *et al.*, 1985; Clarke & Radford, 1986). Since there are no reports about efficacy in out-patient children or in black children it was decided to investigate the usefulness of EMLA cream in Tanzanian schoolchildren undergoing venepuncture.

Methods

EMLA® (Eutectic Mixture of Local Anaesthetics) consists of a mixture of a lignocaine base 25 mg ml^{-1} and prilocaine base 25 mg l^{-1}, together with an emulsifier and a thickener.

Patients

The study was performed in November–December 1987 in two primary schools in a suburb of Dar es Salaam, Tanzania. Forty-two children aged between 8 to 14 years (median 10) participating in an anti-malarial study and scheduled for venepuncture were included. All the children were asymptomatic carriers of *P. falciparum* and all had 1 week previously received a standard sulphadoxine/pyrimethamine (Fansidar) treatment dose. No patients had to be excluded due to known or suspected drug allergy.

Method

Approximately half a tube (2.5 g) of EMLA cream was applied to the right cubital fossa. A plastic film (Tegaderm, 3M) was used for occlusion. During the application time (median 135 min, range 120–145) the children continued their normal school work. After removal of the cream and skin disinfection venous blood-sampling was carried out using Vacutainer needles (22 G). Pain reactions were recorded by the physician. If only a wry face occurred the pain was regarded as slight, when the child tried

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to withdraw his/her arm it was assessed as moderate and if the child cried or resisted the procedure, this was judged as indicative of severe pain. The children were then asked about any pain from the venepuncture. Their reply together with the observation made by the physician, was graded on a four-point verbal scale (no, slight, moderate or severe pain).

Results

No general or local skin reactions were observed. Out of the 42 venepunctures there was only one complaint of moderate pain, 2 of slight pain while the remaining 39 (93%) were without pain. In no child was severe pain reported.

Discussion

The cream was well tolerated by both the children and the teachers. Local reactions or itching were absent and school participation could be continued during the application time.

A previous study in adults indicated that there might be differences in the efficacy of EMLA cream, since the onset of action was delayed and the pain reduction lower in a group of Negro volunteers compared with Caucasians (Hymes & Spraker, 1986). It is possible that the increased density and more compact nature of the stratum corneum in black skin might slow the absorption of a topically applied agent (Hymes & Spraker, 1986). In the present study we therefore chose a longer application time of at least 120 min. The result with 93% pain-free venepunctures in this group of black children is at least equivalent to the results in white children after 60 min of application (Clarke & Radford, 1986; Maunuksela & Korpela, 1986). The stratum corneum is thinner in children and it is possible that there are no ethnic differences in skin penetration in paediatric patients. Whether 60 min application time is generally sufficient in all children needs, however, to be investigated further.

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