The Effect of EMLA Cream on Minimizing Pain during Venipuncture in Premature Infants

Summary
Background: Painful procedures for premature infants in neonatal intensive care units remain inevitable. The goal of this study is to evaluate the effect of an eutectic mixture of local anesthetic (EMLA) cream for minimizing pain in premature infants during venipuncture in neonatal intensive care units.

Methods: This study enrolled 32 premature infants. A repeated-measures design was used. The scores of the ‘Neonatal Pain, Agitation and Sedation Scale’ (N-PASS) of each enrolled preterm infant were measured before, during and 10 min after venipuncture without and with EMLA cream use. Paired t-tests were used to compare the difference of N-PASS scores without and with EMLA cream use.

Results: Paired t-tests revealed a significant decrease in N-PASS scores during venipuncture in infants with EMLA cream. There was no significant change of N-PASS scores before, during and 10 min after venipuncture with EMLA cream by analysis of repeated analysis of variance.

Conclusion: EMLA cream for minimizing pain during venipuncture could be recommended for premature infants.

Key words: EMLA cream, venipuncture, pain, premature infants, local anesthetics.

Because of recent advances in medical technology and the implementation of the National Health Insurance Scheme in Taiwan, the survival rate of very low birth weight premature infants has increased [1]. However, numerous invasive treatments, for example, heel stick and venipuncture, are inevitable for these infants during their hospitalization in neonatal intensive care units (NICUs). Thus, the issue for managing acute pain for these babies is crucially necessary [2].

Here we report our study on the application of an eutectic mixture of local anesthetic (EMLA) cream for minimizing pain in premature infants during venipuncture in the NICU at Kaohsiung Medical University Hospital. There were 32 premature infants enrolled in this study. The mean gestational age was 32.46 ± 2.89 weeks. The mean birth weight was 1669.19 ± 540.42 g. A repeated-measures design was used. Each study infant received venipuncture twice during the study period: one with EMLA cream...
pretreatment before procedure, and the other one without EMLA cream before procedure. A time gap of more than 72 h was required between the venipunctures. The scores of the ‘Neonatal Pain, Agitation and Sedation Scale’ (N-PASS) [3, 4] of each enrolled premature infant were measured before, during and 10 min after venipuncture with and without EMLA cream pretreatment. The result revealed a significant difference between the N-PASS scores during venipuncture without EMLA pretreatment (3.2 ± 2.3) and with EMLA cream pretreatment (1.5 ± 1.6; paired difference: 1.7 ± 2.2, \( p = 0.000 \), by paired t-tests), demonstrating that EMLA cream can effectively minimize the pain of a venipuncture. Figure 1 shows the mean N-PASS scores of the study infants without and with EMLA cream pretreatment at the three time points. To investigate the significant interaction between group (without and with EMLA pretreatment) and time points, we used repeated analysis of variance and Bonferroni multiple comparisons to examine pain levels at the three time points with and without EMLA cream pretreatment. A between-group difference was found regarding the time point of the procedure. No adverse effect was observed in this study.

The strength of this study is that repeated measurements were taken of each participating infant, and paired t-tests were used to compare the N-PASS scores without and with EMLA cream pretreatment, which differs from the majority of previous reports [5, 6]. This repeat-measures study design eliminates confounding factors, such as different pain thresholds, among the different patients.

According to the N-PASS user guidelines, treatment or interventions for known pain and painful stimuli are suggested for scores of more than 3 points. This study revealed that the mean N-PASS score during venipuncture without EMLA cream pretreatment was 3.2 points—more than 3 points—whereas the score decreased to 1.5 points when EMLA cream was applied before the procedure. These results confirm the suitability of using the N-PASS pain assessment tool in NICUs, and that EMLA cream intervention is effective for relieving the pain of venipuncture.

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**Key words**: flash heating, breast milk, HIV, *Staphylococcus aureus*, *Escherichia coli*.

**How Long Does Flash-Heated Breast Milk Remain Safe for a Baby to Drink at Room Temperature?**

**Introduction**

In ‘HIV and Infant Feeding’ (2009), World Health Organization recommend heat-treated expressed breast milk as one option for feeding infants of human immunodeficiency virus (HIV)-positive mothers [1]. World Health Organization also recommended more research on the practicalities and feasibility of this method.

HIV in expressed breast milk can be killed, while retaining nutritional value and immune properties,