

Original research article

Efficacy of Emla (Eutectic Mixture of Local Anesthetics) for Reduction of Pain Associated with Intravenous Cannulation in Paediatric Patients.

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Abstract

Background: Securing intravenous access in children is often challenging for health care professionals. Children view needle sticks as the worst source of pain and fear in the hospital setting. We have undertaken this study with the aim of evaluating the efficacy of EMLA cream in reducing pain while securing intravenous cannula in paediatric patients.

Methods: Fifteen pediatric patients between age group of 2 year to 12 years requiring intravenous access for medication purpose prior to surgery were selected and eutectic mixture of Prilocaine 25mg and Lidocaine 25 mg (Prilox Cream) was applied on desired hand and an occlusive dressing was applied to protect the area. After completion of 60 minutes dressing was removed and intravenous access was attempted. Children rated any pain associated.

Results: 11 (73.33%) patients did not complain of pain, 3 (20%) had mild (1-3) pain scores & 1 (6.67%) was having moderate (4-6) pain score. In this study none of the patient was having severe (7-9) or worst (10) pain. Pain ratings and behavioral distress ratings were generally in the low to moderate range for all patients.

Conclusion: EMLA cream (Prilox cream- Lignocaine and Prilocaine) is effective for producing topical anesthesia for i.v. insertion in paediatric patients.

Key words: IV cannulation, EMLA, Pain scores, Prilox

Introduction

Securing intravenous access in children is often challenging for health care professionals. Multiple attempts at peripheral intravenous cannulation (PIVC) cause increased pain and delayed delivery of therapy. Children view needle sticks as the worst source of pain and fear in the hospital setting.¹⁻³ In an effort to minimize the pain of needle sticks, various techniques have been tried so far to alleviate pain and anxiety resulting from venous cannulation like ethyl chloride spray, intradermal or subcutaneous injection of lignocaine and distraction methods.⁴

With the pharmaceutical discovery of the use of eutectic mixture of lidocaine and prilocaine (EMLA), it has become a standard practice in many children's hospitals and paediatric care units in developed countries. Many studies have assessed the efficacy of EMLA, but the

evidence from literature is conflicting with some of the studies reported good efficacy⁵ while some did not find changes in pain severity.^{6,7}

There barely a few studies in India on this topic, hence we have undertaken this study in our setting of tertiary care hospital with the aim of evaluating the efficacy of EMLA cream in reducing pain while securing intravenous cannula in paediatric patients.

Objective:

To assess the severity of pain at intravenous access after 60 minutes of applying eutectic mixture of local anesthetics using Visual Analog Scale (VAS).

Material and Methods:

The protocol of this observational study was approved by the Institutional Ethics committee of the medical college. Written informed consent was taken from all study subjects before collection of data. Study was conducted among 62 patients fulfilling inclusion criteria and exclusion criteria admitted in paediatric ward of tertiary care hospital were taken up for the study until fulfilling the required sample size. Study was carried out from January 2022 to April 2022.. .

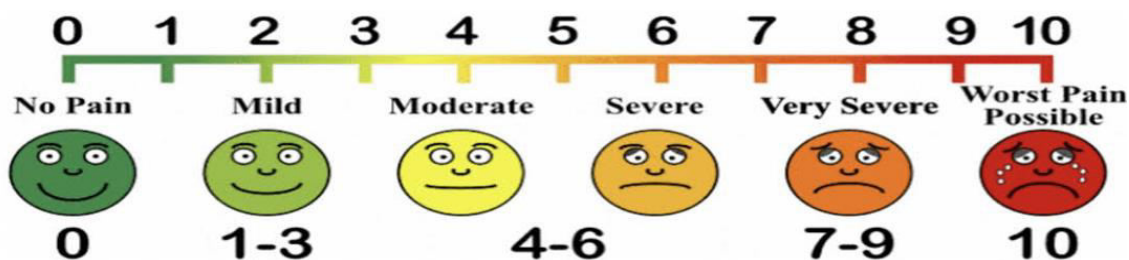
Inclusion Criteria was pediatric patients between age group of 2 year to 12 years requiring intravenous access for medication purpose prior to surgery. A routine pre-operative evaluation was done for all patients and the following patients were excluded:

- Patients whose parents or guardian not giving consent to participate in the study.
- Patients with known hypersensitivity to EMLA cream or any other local anesthetics.
- Patients with methemoglobinemia or on drugs that may cause methemoglobinemia.
- Patients with mental illness.
- Patients with open wounds on dorsum of hand.

15 paediatric patients undergoing elective surgeries were selected for inclusion in the study. Sampling method was purposive method of non-probability sampling.

Method of assessment:

Fifteen pediatric patients between age group of 2 year to 12 years requiring intravenous access for medication purpose prior to surgery were selected and eutectic mixture of Prilocaine 25mg and Lidocaine 25 mg (Prilox Cream) was applied on desired hand and an occlusive dressing was applied to protect the area. After completion of 60 minutes dressing was removed and intravenous access was attempted. Children rated any pain associated with the i.v. insertion using Visual Analog Scale (VAS) or else it interpreted from their grimace, cry or facial expression & rated on VAS scores.



Data was entered in Microsoft Excel and analyzed using SPSS Software IBM version 20.

Results:

In the present observational study, we have analyzed 15 patients, so the response rate was 100%.

Table 1: Distribution of patients according to some baseline characteristics.

Sr. No.	Baseline characteristic	Frequency (no.)	Percentage (%)	
1	Age groups	2-5	06	40
		5-8	07	46.67
		8-10	02	13.33
2	Gender	Male	13	86.67
		Female	02	13.33
3	Diagnosis of the patient	Appendicitis	01	6.67
		Fracture	03	20
		Hernia	08	53.33
		Meatal stenosis	01	6.67
		Phimosis	01	6.67
		Vestibular anus	01	6.67
4	Operative procedure performed	Appendectomy	01	6.67
		Anal transposition	01	6.67
		Circumcision	01	6.67
		CRIF	02	13.33
		Herniotomy	08	53.33
		Meatal Dilatation	01	6.67
		ORIF	01	6.67

Table no.1 shows that in the present study majority i.e. 7 (46.67%) of the patients were in the age group of 5-8 years followed by 6 (40%) from the age group of 2-5 years and least i.e. 2 (13.33%) were in the age group of 8-10 years.

There was male preponderance (83.67%) whereas female paediatric patients constituted 13.33% of the study subjects. Out of total 15 patients, 8 (53.33%) patients had hernia, 3 (20%) had fracture and appendicitis, meatal stenosis, vestibular anus in 1 (6.67%) each. Of which 8 (53.33%) patients operated with herniotomy, 2 (13.33%) with CRIF, 1 (6.67%) each with appendectomy, anal transposition, circumcision, meatal dilatation & ORIF.

Table 2: Pain scores among patients as per VAS scale.

Pain score	Frequency (no.)	Percentage (%)
0 (No pain)	11	73.33
1-3 (Mild)	03	20
4-6 (Moderate)	01	6.67
7-9 (severe)	00	00
10 (Worst pain)	00	00
Total	15	100

Table no.2 shows the assessment of pain severity with VAS scale, we have found that 11 (73.33%) patients did not complain of pain, 3 (20%) had mild (1-3) pain scores & 1 (6.67%) was having moderate (4-6) pain score. In this study none of the patient was having severe (7-9) or worst (10) pain. Pain ratings and behavioral distress ratings were generally in the low to moderate range for all patients.

Discussion:

A hospital based observational study was conducted among 15 paediatric patients to assess the efficacy of EMLA cream in reducing pain while securing intravenous cannula. Most of the patients were under 8 years of age. There was male preponderance in our study.

According to visual analogue scale for assessing pain severity, most (73.33%) patients had no pain. Rest 4 (26.67%) patients had pain and behavioral distress ratings in the range of low to moderate. Consistent results reported by Tomomi Matsumoto et al⁸ who found that EMLA cream is more effective for venipuncture pain relief than lidocaine tape. Ayman Anis Metry et al⁹ compared EMLA cream, ketoprofen patch, and lidocaine injection & concluded that all have equal ability to alleviate pain due to cannulation when applied before the procedure, but ketoprofen patch is more superior as it had less local inflammatory effect in comparison to EMLA cream and without double puncture as with lidocaine injection. Vijaykumar S et al¹⁰ in a study of onset and duration of action of local anesthetic eutectic mixture in New Zealand white rabbits, found that onset and duration of action for local anesthetic EMLA cream depends on dosage and contact time of drug on intact skin. Pushpamala Ramaiah et al¹¹ also found EMLA is effective in reducing pain.

Conclusions:

Results from this study support the claim that a min 60 -min application of EMLA cream (Prilox cream- Lignocaine and Prilocaine) is effective for producing topical anesthesia for i.v. insertion in paediatric patients. Hence, we recommend to use EMLA before IV cannulation in paediatric patients.

Declaration:

There was no source of funding in our study and there was no conflict of interest.

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