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RESEARCH ARTICLE

A COMPARATIVE STUDY OF INJECTABLE LIGNOCAINE AND EMLA FOR SHORT DERMATOSURGERIES

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ABSTRACT

The topical anaesthetic available now a day can serve as a better alternative to injectible local anaesthetics for short dermatosurgical procedures. EMLA cream (eutectic mixture of local anesthetics), a topical local anesthetic cream has been shown to penetrate intact skin and provide analgesia of superficial layers. Few comparative studies are available which have shown EMLA to be an efficacious and acceptable option as local anaesthetic but as we know, pain and thence analgesia is a subjective perception and there can be wide interindividual variation in the results. So, this study was done to evaluate the anaesthetic potential of EMLA over lignocaine infiltration by applying both in the same individual. A total of thirty patients with warts, skin tags or molluscum which were planned for radiofrequency ablation were recruited to the study protocol. In each patient, in half of the lesions lignocaine was infiltrated and in the remaining EMLA was topically applied under occlusive dressing.The procedure was executed after 5 minutes of lignocaine infiltration and 30 minutes of EMLA application. Pain assessment was done using VAS (visual analogue score). Pain assessment was done both at the time of application and during the procedure. Extent of the pain was also assessed by the patient on a verbal rating scale. The results of the study show that lignocaine infiltration caused mild to moderate pain, while none of the patient experienced any type of pain on application of EMLA cream. The pain assessment during the anesthetics application, showed that lignocaine infiltration caused significantly higher VAS score in comparison with the EMLA application (<0.001). However, during the surgical procedure, EMLA applied patients experienced significantly higher VAS score in comparison with the lignocaine infiltrated patients (P<0.05). Howsoever, the patient's acceptability to the EMLA application was found to be more in comparison with lignocaine. Adverse events were mild and comparable in both the groups. In conclusion EMLA is an efficacious alternative to lignocaine infiltration for shortdermatosurgery by radiofrequency and has better patient acceptability.

KEYWORDS: EMLA, Lignocaine, Radiofrequency ablations, VAS, Warts, Molluscum, Skin tags

INTRODUCTION:

Most of the short dermatosurgeries, like skin tag removal, ablation of warts, removal of molluscum by radiofrequency, skin biopsy, rhinophyma etc are performed in an outpatient setting and as day care surgeries, under local anesthesia. There are mainly two ways by which intact skin can be anesthesized, one by infiltration of local anaesthetic at the site of procedure or by applying topical anesthetic. Many of the short dermatosurgeries are performed by radiofrequency. Radiofrequency ablation is a versatile dermatosurgical procedure used for the surgical management of skin lesions by using various forms of alternating current at an ultra high frequency [1]. Pain control associated with invasive procedures of the dermatosurgery and cosmetic dermatological procedures is a major confront. Local infiltration anesthesia in itself is quite a painful procedure in dermatosurgery, probably due to pain during needle insertion. Elimination of the needle for local anesthesia would be an immense instigate in dermatosurgery. In this context, the development of topical anesthetics is commendable and has provided a superior alternative for anaesthetizing the intact skin.

EMLA cream is a FDA-approved topical anesthetic comprised of eutectic mixture of 2.5% lignocaine and 2.5% prilocaine that penetrates intact skin and allows topical and transdermal analgesia[2]. Its duration of action and depth of penetration depends upon the application time and dose. Topical application under occlusive dressing

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augments the analgesic potential of the EMLA cream. Many comparative studies of lignocaine infiltration and topical EMLA application have been done in the past which shows EMLA to be a better alternative to lignocaine infiltration [3,4,5]. Most of these studies have compared lignocaine infiltration and EMLA application in different individuals. However, we know that there can be wide variation in pain assessment between different individuals. So, this study was planned to compare the efficacy, safety and patient acceptability of topical EMLA cream with lignocaine infiltration, by applying both in all enrolled subjects so that variability due to subjective pain assessment could be minimized.

MATERIALS AND METHODS:

To evaluate the efficacy, safety and patient acceptability of topical EMLA cream with lignocaine infiltration, we performed a prospective study in patients undergoing short dermatological procedures. This study was done in the department of pharmacology and department of dermatology. A written informed consent was taken by all the enrolled patients.

A total of 30 patients participated in the study. Only those patients were included who had even number of lesions for which the radiofrequency ablation was to be done, so that in each patient for half of the lesions lignocaine could be infiltrated and in half EMLA could be topically applied. Among the enrolled patients 12 had warts, 10 skin tags, and 8 had molluscum, which were planned to be removed by radiofrequency. The number of lesions in an individual ranged from six to twenty. In each patient in half of the lesions lignocaine was infiltrated and in another half EMLA was topically applied under occlusive dressing. The radiofrequency ablation was executed after 5 minutes of lignocaine infiltration and 30 minutes of EMLA application, so EMLA was applied about twenty five minutes before lignocaine infiltration.

All the patients were apparently healthy except for the above mentioned lesions. None of the patient had received any treatment for this for last 15 days and was not allergic to the amide-type of local anesthetics. There was no statistically significant difference in the patients of both the groups with respect to sex, age and site of the lesions. The dermatosurgical procedure in each patient was completed within 15 min after start of the procedure.

ASSESSMENT OF PAIN:

Pain experienced during lignocaine infiltration and EMLA application was assessed by using a 10 cm visual analogue scale (VAS) with the end points of 0 cm rated as no pain and the points of 10 cm as intolerable pain. Extent of the pain was also assessed by the patient on a verbal rating of no pain, mild (quite tolerable), moderate (not quite tolerable), and severe pain (intolerable). Pain assessment during the radiofrequency ablation procedure was also judged in the similar mode. If surgery was interrupted due to pain, the pain assessment for the initial treatment was made before the administration of additional anesthetic.

ASSESSMENT OF LOCAL REACTIONS:

The patients were asked about any local reaction or any other type of discomfort, before the start of the procedure and concomitantly the adverse events for instance, local erythema and edema were also assessed by the physician. The reactions were rated as none, slight, moderate or profound. The presence of any other adverse reactions was also looked for.

STATISTICAL ANALYSIS:

Comparisons between the groups were performed using the student t test. The level of statistical significance for all the comparisons made was established at $P \leq 0.05$. All data were analyzed by means of the statistical package SPSS 15 (SPSS Sciences, Chicago, USA).

RESULTS:

In the present study, we found that lignocaine infiltration caused mild to moderate pain on the other hand none of the patient experienced any type of pain on application of EMLA cream (**Figure 1**). Analgesia produced by EMLA was good and appeared comparable to the lignocaine infiltration.

During the dermatosurgical procedure 70% of the patients reported mild pain, 6.6% moderate pain and 23.33% no pain on the EMLA applied sites while at Lignocaine infiltrated sites, it was mild in 19.6% and 80.3% reported no pain. However, the pain experienced was maximum during lignocaine infiltration, whereby 70% of the patients reported mild pain and 30% moderate pain. (Figure 1).

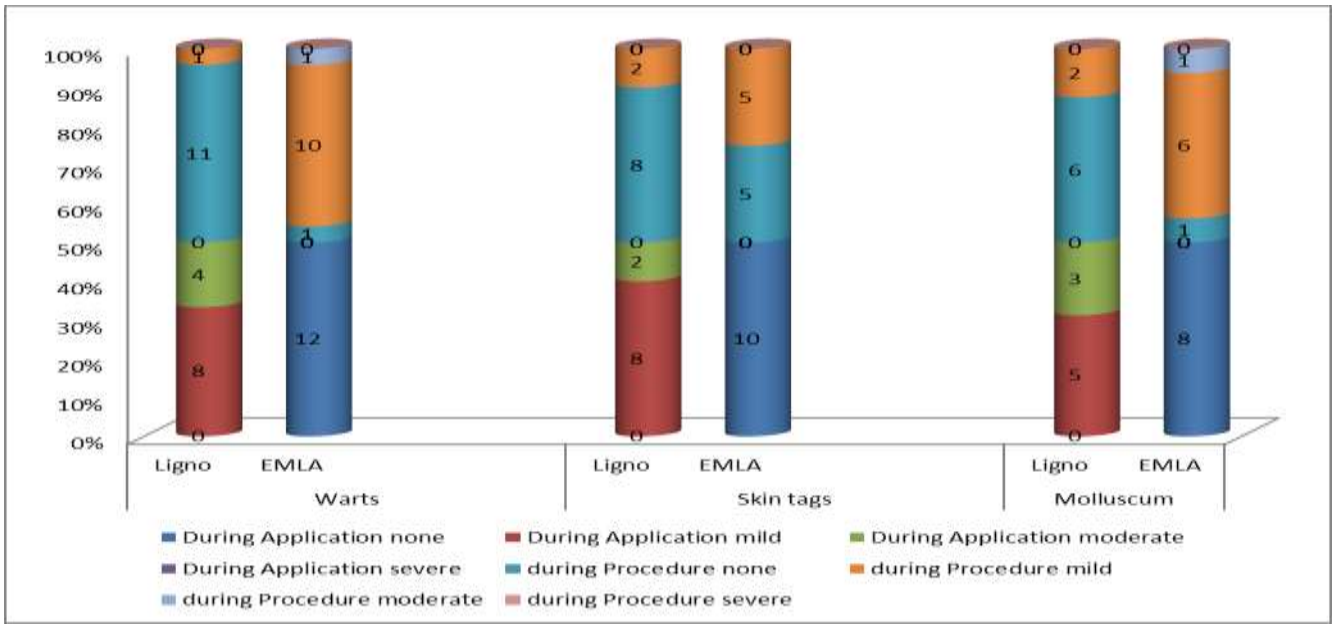

Figure 1: Verbal Rating Scale: Lignocaine v/s EMLA

The pain assessment by VAS during the anesthetics application, lignocaine infiltration showed significantly higher VAS score in comparison with the EMLA application (P<0.001) in all patients (Table 1). However, during the surgical procedure, at EMLA applied sites VAS score was more in comparison with the lignocaine infiltration (P<0.05) in all the patients. (Table 1). It was also observed that the VAS score during lignocaine infiltration was higher than the VAS score during procedure at EMLA sites (P<0.05).

Table 1: Vas score during anaesthetic application and procedure

Lesions	During Application		During Procedure	
	Lignocaine	**EMLA**	**Lignocaine**	**EMLA**
Warts	3.33±1.079*	0	0.25±1.94	1.75±0.609®
Skin tags	2.8±1.421*	0	0.2±0.148	0.8±0.394®
Molluscum	3.5±0.707*	0	0.5±0.378	2.025±0.790®

* = P< 0.001Lignocaine application vs EMLA procedure

® = P< 0.05Lignocaine procedure vs EMLA procedure

Therefore the results demonstrated that although, anaesthetic potential of EMLA is less than lignocaine infiltration but still it was observed that the pain caused by procedure with EMLA application is less than the pain caused by lignocaine infiltration. Moreover patient acceptability to the EMLA application was found to be more in comparison with lignocaine infiltration. Adverse events were mild and comparable in both the groups.

DISCUSSION

Demonstrated that although anaesthetic potential of EMLA as compared to lignoaine infiltation was less but patient acceptability was more for EMLA. One reason for the higher acceptability to EMLA cream by the patients could be elimination of needle fright during anesthetic application.

We found that the VAS score for pain assessment during lignocaine infiltration was more as compared to the score of the EMLA during surgical procedure. Some of the patients experienced mild pain during the procedure even after lignocaine infiltration. This indicates that for lignocaine infiltration the patients may have to experience the pain for two times (during infiltration as well as during surgical procedure). This might be another reason behind lower acceptability to lignocaine infiltration. Hallen et al applied EMLA to genital warts located to the perigenital skin or the genital mucosa for 20- 105 minutes prior to thermocautery, reporting that anaesthesia was satisfactory in 96% of men and 40% of women[8]. Our study does not show any sex variation in analgesic effect. Some studies done in the past have demonstrated that the onset of analgesia on face skin was less than twenty five min after

EMLA cream has been shown to be effective in anaesthe

EMLA application under occlusive dressing [9]. The efficacy of EMLA is due to occlusive dressing which aids diffusion into the skin. EMLA forms a depot in the stratum corneum during occlusion which results in continued and even increase in analgesia 15 - 60 minutes after removal of the medication [10, 11]. In yet another study it was shown that EMLA is a useful analgesic for laser treatment of portwine stains [12]. Few researchers have also found EMLA effective in relieving pain associated with punch biopsies [13]. Our findings are in agreement to these reports. However, in present study most of the patients have suffered mild pain during the surgical procedure even after 30 min of EMLA application under occlusive dressing. This signifies that a longer application time may reduce the percentage of patients experiencing mild pain during radiofrequency ablation. After 120 min of the EMLA cream application, more than 3mm in depth for the perception of pressure from needle insertion has been demonstrated by Bjerring and Arendt- Nielsen[14]. Saxena *et al*. have reported that EMLA cream is more effective anesthetic than lignocaine gel for intravenous cannulation and this may be the result of higher concentration of local anesthetics in EMLA cream (5%) as compared to lignocaine gel (2%) [15]. In present study the lower but comparable anesthetic potential of the EMLA cream to lignocaine may be the result of its lower penetration on intact skin. Moreover we applied EMLA cream for 30 min before start of the surgical procedure, which might have not provided adequate concentration of EMLA for complete anesthetic effect on the intact skin. A longer application period of EMLA cream may enhance its anesthetic activity on intact skin. On the other hand for lignocaine, penetration was not an impediment for anesthetic activity as it was infiltrated. In conclusion, EMLA is an efficacious, safe and a better alternative to lignocaine infiltration for radiofrequency ablation and has higher patient acceptability. The number of patients in the present study is limited therefore additional, large-scale studies are needed to confirm the anesthetic efficacy of EMLA cream on intact skin.

REFERENCES:

1. Silonie Sachdeva, Alka Dogra. Radiofrequency ablation in dermatology. Indian j of dermatology 2007; 52(3): 134-137.
2. Neal D. Kravitz, DMD, MS. The use of compound topical anesthetics. Journal of American dental association 2007; 138: 1335-1339.
3. Gerdien M Berg, Stefan Lillieborg, Ernst Stolz. Lidocaine/ prilocaine cream (EMLA) versus infiltration anaesthesia: a comparison of the analgesic efficacy for punch biopsy and electrocoagulation of genital warts in men. Genitourinary medicine 1992; 68: 162-165.
4. Joly L Spaulding C, Monchi M, Ali OS, Weber S, Benhamou D. Topical lignocaine- prilocaine cream (EMLA) versus local infiltration anaesthesia for radial artery canulation . Anaesth Analg 1998; 87: 400-402.
5. Singh S, Singh R, Singh JP. Anesthetic Potential of Lignocaine/ Prilocaine Cream (EMLA) Versus Lignocaine infiltration for radiofrequency ablation of warts. International Journal of Pharmaceutical Sciences and Research 2012; 3(3): 858-62.
6. Juhlin L, Evers H. EMLA: a new topical anaesthetic. Adv in Dermatology 1990;5:75-92.
7. Juhlin L, Evers H & Broberg F. A lidocaine- prilocaine cream for superficial skin surgery and painful leisons. Acta Dermato Venerologica (Stockholm). 1980; 60: 544-546.
8. Hallen A, Ljunghall K, Wallin J. Topical anaesthesia with local anaesthetic (lidocaine and prilocaine, EMLA) cream for cautery of genital warts. Genitourin Med 1987-63:316-9.
9. Holmes HS. Choosing a local anesthetic. *Dermatol Clin.* 1994; 12**:** 817–822.
10. Arendt-Nielsen L, Bjerring P. Laser-induced pain for evaluation of local analgesia. *Anesth Analg.* 1988; 67: 115–123.
11. Evers H, Von Dardel O, Juhlin L, et al. Dermal effects of compositions based on the eutectic mixture of lignocaine and prilocaine (EMLA). *Br J Anaesth.* 1985; 57: 997–1005.
12. Tan OT, Stafford T I. EMLA for treatment of portwine stain in children.Laser Surg Med 1992; 12: 543-548.
13. Gerdien M v d Berg, Stefan Lillieborg, Ernst StolzLidocaine/prilocaine cream (EMLA(R)) versus infiltration anaesthesia: a comparison of the analgesic efficacy for punch biopsy and electrocoagulation of genital warts in men Genitourin Med 1992;68:162-165.
14. Bierrina P, Arnendt- Nielson L. Depth and Duration of skin analgesia to needle insertion after topical application of EMLA cream. Br J Anaesth 1990; 64: 173-177.
15. Saxena KN, Dua CK, Taneja B. A comparative Evaluation of lignocaine gel versus EMLA cream for painfree iv cannulation. J Anaesth Clin Pharmacol 2004; 20 (3): 279-282.

