

Comparison of EMLA to LMX-4 for Sharp Wound Debridement

July 27, 2017 | Wendy Woith, PhD, RN, FAAN

Conflict of Interest Statement

- The authors have no conflicts of interest to report
- Wendy Woith, Ph.D., RN, FAAN, is the Advocate BroMenn Endowed Professor and holds a joint appointment between Illinois State University and Advocate BroMenn Medical Center.
- Jennifer Perry, BSN, RRN, CHRN, and Jessica Lee, BSN, RN, CHRN, are employed by the Advocate BroMenn Wound Healing Center.
- There were no sponsors for this study.

Objectives

- Upon completion of this session, learners will be better able to:
 - describe differences between EMLA and LMX-4 in managing pain associated with sharp wound debridement.
 - discuss clinical implications associated with using EMLA and LMX-4 for managing pain during sharp wound debridement.

Background

- Sharp wound debridement involves using a scalpel or scissors to remove tissue, and may be painful.
- Eutectic mixture of 2.5% lidocaine and 2.5% prilocaine (EMLA) and 4% liposomal lidocaine cream (LMX-4) are both widely used for topical anesthesia.
- The literature revealed mixed results regarding effectiveness of these agents by location and type of procedure.
- No studies were found comparing EMLA to LMX-4 for sharp debridement.



Purpose

- To compare the efficacy of EMLA to LMX-4 in managing pain during sharp wound debridement.

Design

- Randomized 2x2 cross-over design, double-blinded
 - Group A (n = 20) LMX-4 at first debriding (D1), EMLA at second debriding (D2)
 - Group B (n = 20) EMLA at T1, LMX-4 at T2

Setting and Sample

- Wound clinic in Midwest USA
- Typically treats ~5,000 wounds annually
- 40 enrolled (women = 28, men = 12), 32 completed study (women = 23, men = 9); mean age = 64.73 years
 - 75% attrition due to wound healing
 - Wound type: vascular 57.5%, lymph 15%, surgical 13%, other 15%

Procedure

- EMLA for 30 minutes, LMX-4 applied for 15 minutes, both under occlusion
- 1-2 weeks between debridings
- Pain measured at 3 points each debriding using Visual Analog Scale (0 to 10)
- Debriding followed standard practice

Mean Pain Scores of Agents at Three Assessment Points

Anesthetic Agent and Time of Pain Assessment	n	Min	Max	Mean	SD
EMLA before procedure	32	0	6	1.42	1.79
LMX-4 before procedure	32	0	6	0.83	1.52
EMLA during procedure	32	0	10	3.14	2.85
LMX-4 during procedure	32	0	7	3.00	2.39
EMLA after procedure	32	0	5	2.19	1.83
LMX-4 after procedure	32	0	6	1.86	1.93

Mean Pain Scores for Pain Assessment Points by Time of Debridement

Pain Assessment Points	Anesthetic	Mean	SD	n
1 st debridement: Pain after application	EMLA	2.06	2.14	16
	LMX-4	0.69	1.54	16
2 nd debridement: Pain after application	EMLA	0.81	1.38	16
	LMX-4	1.06	1.65	16
1 st debridement: Pain during procedure	EMLA	3.44	3.32	16
	LMX-4	4.00	2.63	16
2 nd debridement: Pain during procedure	EMLA	2.88	2.70	16
	LMX-4	2.00	1.63	16
1st debridement: Pain after procedure	EMLA	2.56	2.13	16
	LMX-4	2.21	2.12	16
2 nd debridement: Pain after procedure	EMLA	1.75	1.61	16
	LMX-4	1.38	1.45	16

Mean Pain Scores for Pain Assessment Points by Treatment Order

Pain Assessment Points	Group	Anesthetic Order (Debridement 1 or 2)	Mean	Mean Difference	n
Pain after application	A	LMX-4 (D1)	0.69	-0.12	16
		EMLA (D2)	0.81		16
	B	EMLA (D1)	2.06	1.00	16
		LMX-4 (D2)	1.06		16
Pain during procedure	A	LMX-4 (D1)	4.00	1.12	16
		EMLA (D2)	2.88		16
	B	EMLA (D1)	3.44	1.44	16
		LMX-4 (D2)	2.00		16
Pain after procedure	A	LMX-4 (D1)	2.31	0.56	16
		EMLA (D2)	1.75		16
	B	EMLA (D1)	2.56	1.18	16
		LMX-4 (D2)	1.38		16

Results

- No significant difference between EMLA and LMX-4 in managing pain ($t(1,31) = -.892$, $p = .379$)
- Patients had more pain during debriding than at any other time ($\lambda = .369$, $F(3,28) = 15.964$, $p < .001$)
- Patients had more pain during the first debriding than during the second ($D1 > D2$) ($\lambda = .825$, $F(1,30) = 6.368$, $p = .017$).

Results (con't)

- Group A was more likely to report greater pain during second debriding with EMLA ($m = 2.08$) than during first debriding with LMX-4 ($m = 2.07$) ($\lambda = .830$, $F(1,30) = 2.977$, $p = .067$).
- 41% preferred LMX-4 to EMLA (28%).
- EMLA caused burning upon application lasting up to 5 minutes ($n = 5$).

Conclusions

- EMLA and LMX-4 were equally effective in managing pain.
- EMLA mean pain scores were higher at all assessment points.
- Patients experienced more pain during debriding than before or after.
- Patients experienced less pain during D2.
 - Some healing occurred between treatments, requiring less tissue removal.
 - Decreased anxiety as a result of knowing what to expect may account for lower pain

Conclusions

- Although patients experienced less pain at D2, Group A reported greater pain at D2 with EMLA. These results bordered on significance and may have affected patient preference for LMX-4.
- Effective pain management was achieved in 30 minutes with EMLA and 15 minutes with LMX-4.

Implications

- Use of LMX-4 may help improve patient satisfaction with sharp wound debridement.
- Less time to effective anesthesia results in shorter time to treatment and shorter length of stay.

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