The purpose of this study was to evaluate the clinical efficacy of a triple-anesthetic gel and compare it with 3 other topical anesthetics for induction of local anesthesia. The triple-anesthetic gel consisted of benzocaine, lidocaine, and tetracaine (BLT); the 3 other topical anesthetics were an eutectic mixture of lidocaine 2.5% and prilocaine 2.5% (LP) cream, with and without occlusion; a lidocaine 5% cream (LS); and a lidocaine 4% microemulsion (LM) gel. Equal amounts of the 4 topical anesthetics, plus a control, were applied to 6 test sites (the LP cream accounted for 2 test sites, with and without occlusion) on the forearms of 30 adult volunteers. At all intervals (15, 30, 45, and 60 minutes after application), pain scores were significantly lower with the BLT gel than with the 3 other topical anesthetics. In addition, at 15 and 30 minutes, pain scores were similar among the 3 other topical anesthetics. At 45 minutes, pain scores were slightly lower with the LM gel than with the LP cream and the LS cream. At 60 minutes, pain scores were lower with the LM gel and the LP cream with occlusion than with the LS cream and the LP cream without occlusion. All topical anesthetics were superior to the control at all intervals.

The rapid proliferation of laser and cosmetic procedures has made adequate analgesia necessary for patient comfort and tolerability of optimal treatment settings necessary for maximal results. In a busy practice, tying up rooms with patients waiting an hour or more for their topical anesthetic to take effect is less than optimal. Safety is another consideration—longer exposures to lidocaine can lead to systemic absorption. (A topical anesthetic that has a faster onset of activity has a higher safety profile.)

The goal of this prospective study was to evaluate the clinical efficacy of a triple-anesthetic gel and to compare it with the efficacy of 3 other topical anesthetics for induction of local anesthesia.

**METHODS**

Thirty patients were enrolled in this prospective study, conducted at The East Bay Laser & Skin Care Center, Walnut Creek, California. The topical anesthetics studied were a triple-anesthetic gel, consisting of benzocaine 20%, lidocaine 6%, and tetracaine 4% (BLT), plus 3 other topical anesthetics: EMLA®, lidocaine 2.5% and prilocaine 2.5% (LP) cream; ELA-Max®, lidocaine 5% (LS) cream; and Topica® 4%, lidocaine 4% microemulsion (LM) gel.

The BLT gel was formulated at a private pharmacy. The proprietary vehicle contains dimethyl sulfoxide and pluronic lecithin organogel (PLO), which help increase absorption through the skin. The BLT gel looks and feels like a cream. Because of its surfactant qualities and viscosity at room temperature, the aqueous pluronic gel holds together the emulsion it forms with the lecithin oil base. Chilling PLO causes it to turn into a liquid, after which it can separate into its aqueous and oil components (separation usually occurs in a matter of weeks). BLT gel should be stored at room temperature and should be applied only to intact skin, with or without occlusion, for 10 to 30 minutes. BLT gel contains ester anesthetics that are contraindicated for patients with allergies to p-aminobenzoic acid (PABA), hair dyes, and sulfonamides.

A 5% eutectic mixture of LP contains amide-type local anesthetic agents. The onset, depth, and duration of analgesia on intact skin induced by the 5% eutectic LP mixture depend primarily on the duration of application. The LP cream should be applied with occlusion for at least 1 to 2 hours. Dermal analgesia is satisfactory 1 hour after application, reaches a maximum after 2 to 3 hours, and persists 1 to 2 hours after removal. Adverse systemic reactions have been reported.

The LS formulation used in this study contains 5% lidocaine in a liposomal delivery system. It is marketed for temporary relief of anorectal pain but is commonly used as a skin anesthetic. Liposomes facilitate penetra-
532-nm KTP Laser

Settings: 2 mm, 10 ms, 10 J/cm²

Reported Pain Level

CONTROL

LP  LPO  L5  LM  BLT

30 Minutes
With the rising popularity of laser procedures, the need for more effective and rapidly acting topical anesthetics continues to grow. Mean time between application and desired anesthesia typically exceeds 60 minutes, which is not practical for most busy practices. Convenience of application, including the ability to forgo occlusion, is also an important consideration. The BLT gel studied here produced adequate anesthesia as early as 15 minutes after application without occlusion. Using an occlusive dressing with each of the 4 topical anesthetics most likely would have improved efficacy across the board.

Systemic lidocaine toxicity is a concern, especially when a large amount of lidocaine is used with occlusion for a long period—and even more so when a laser is used to remove hair from large areas, such as the back. Shortening the time between lidocaine application and the onset of anesthesia may also decrease the risk of systemic absorption that is enhanced by long-term exposure with occlusion.

In using BLT gel to treat thousands of patients over the last 3 years at The East Bay Laser & Skin Care Center, no allergic reactions or signs of systemic toxicity have been encountered. For each patient, a thorough medical history should be obtained; details regarding allergies to PABA, hair dyes, and sulfonamides and reactions to various anesthetics are especially important. Medications that may affect hepatic metabolism and conditions that affect the liver also should be considered.

The high level of efficacy and rapid onset of action found for BLT gel in this study were not duplicated with other formulations containing the same active ingredients but lacking the same vehicle. Anecdotally, several other physicians also have reported that they used the same proportion of active ingredients when mixing the BLT formulation on their own, but that the results were less satisfactory without the proper vehicle to enhance absorption. Apparently, for proper anesthesia, the vehicle is just as important as the active ingredients.

**CONCLUSION**

This BLT gel in a vehicle containing permeation enhancers can provide effective cutaneous anesthesia as early as 15 minutes after application without occlusion. Anesthesia reached a maximum 30 minutes after application. Other studies are needed to compare BLT gel with other topical anesthetics, with and without occlusion.

**REFERENCES**

Topical Anesthetics


PRODUCT LIST

- Benzocaine 20%, lidocaine 6%, and tetracaine 4% gel (American Health Solutions Pharmacy, Los Angeles, California).

- EMLA®, eutectic mixture of lidocaine 2.5% and prilocaine 2.5% cream (AstraZeneca LP, Wilmington, Delaware).

- ELA-Max 5®, lidocaine 5% cream. (Ferndale Laboratories, Ferndale, Michigan).

- Topicaine®, lidocaine 4% microemulsion gel (ESBA Laboratories, Mountain View, California).