



# HerbClip™

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**FILE: ■ Clove (*Syzygium aromaticum*)**

■ **Topical anesthetic**

■ **Benzocaine**

**HC 060262-317**

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**RE: The Effectiveness of Clove (*Syzygium aromaticum*) as a Topical Anesthetic**

Alqareer A, Alyahya A, Andersson L. The effect of clove and benzocaine versus placebo as topical anesthetics. *J Dentistry*. 2006 Nov;34(10):747-50.

Dentists employ injections of local anesthetics to reduce pain and anxiety when performing dental procedures. However, these local injections themselves can be a source of pain and anxiety for many patients. Topical anesthesia is therefore widely used in dental procedures, especially for pediatric patients. One of the most commonly used agents is benzocaine. A "substantial number" of studies of varying design have been conducted on benzocaine as a topical anesthetic. However, the results have been inconsistent, with some studies showing "a good effect," whereas others indicate that benzocaine is "not particularly efficacious."

There are several disadvantages to the use of topical anesthetic drugs, including toxicity, possible adverse side effects, and the potential for systemic absorption. Systemic absorption is of particular concern for pediatric dentistry. Dentists may therefore need to reduce the amount of local anesthetic they can inject in that population.

The present randomized, single-blind study was designed to investigate "whether the natural herb clove (*Syzygium aromaticum*) can replace benzocaine as a topical anesthetic." The traditional cooking spice, clove, contains eugenol, an oily liquid that has analgesic and antiseptic properties. Eugenol, and other constituents of clove, such as vanillin and iso-eugenol have also been reported to have antimicrobial effects. To the authors' knowledge, this is the first study to compare the efficacy of clove vs. 20% benzocaine in reducing needle stick pain.

Participants for this study were recruited from healthy dental, medical and pharmacy students at Kuwait University, where the study was conducted. Four materials were tested in this study: 1) Home made clove gel, 2) Benzocaine 20% gel (Topex™ Sultan Dental Products, Englewood, NJ, USA), 3) Placebo resembling clove gel, and 3) Placebo resembling benzocaine. To prepare the clove gel, commercially available cloves were ground to a fine powder and mixed with glycerin in a 2:3 (clove:glycerin) ratio. The clove placebo consisted of pumice mixed with glycerin, which created a texture similar to that of clove gel. The benzocaine placebo was made from petroleum jelly, which has a texture similar to that of benzocaine. All 4 materials were stored in identical containers.

All the participants were smell and sight-blinded prior to the experimental procedure. A protective goggle was placed over the eyes. A cotton roll covered with both materials used in the study was mounted in a special projection on the goggles to blind the participants to smell.

The 73 participants were randomized to 1 of 2 groups. In 37 volunteers, clove gel was applied on 1 side of the mouth, and placebo was applied to the other side of the mouth. In 36 volunteers, benzocaine was applied on 1 side and placebo was applied on the other side. The order of application (placebo or active drug first), and which side of the mouth received the first application was randomly determined.

Two grams of material were applied to a cotton roll, and then to an area approximately 1.5 centimeters in diameter on the buccal mucosa superior to the gingiva over the canine prominence. After 4 minutes the material was applied again to compensate for any washout by saliva. After removal of the cotton roll and any excess material a needle-stick was performed 3 mm superior to the mucogingival border. A 25 gauge needle was used and inserted until bone contact was achieved, then withdrawn. Participants were then unblinded and instructed in the use of a 100-mm visual analog pain scale (VAS). On the VAS "0" indicates "no pain at all," and "100" indicates "unbearable pain." After scoring their pain level, volunteers rinsed their mouths and rested for a short time. Then the same procedure was repeated using the second material on the opposite side of the mouth.

The pain scores of the 2 placebo groups were not significantly different, so the information was pooled and the data analysis was performed as if there were 3 groups. There was no significant difference between the pain scores of the clove gel group and the benzocaine group. Both substances had significantly lower pain scores than the placebo group ( $P=0.05$ ). In general, females had significantly higher pain scores than males ( $P= 0.026$ ).

The application of both benzocaine and clove gel caused a burning sensation in most of the participants. Four volunteers (5.4%) developed small aphthous-like ulcers on the site of clove gel application. Eugenol is known to cause tissue irritation, so further research is necessary to determine the optimal concentration of clove gel with the least side effects.

The results of this study "showed that both clove and benzocaine 20% gels are able to significantly reduce pain from needle sticks when compared with placebo." Clove gel is widely available in rural areas and costs one-fifth as much as other topical anesthetics.

Thus, clove gel provides dentists with an alternative to benzocaine for topical anesthesia in their daily practice, especially for use with children and in areas where cost and availability limit access to pharmaceutical topical anesthetics.

— Cathleen Rapp, N.D.

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