

3rd International Conference on

Advanced Dental Education

November 15-16, 2018 | Edinburgh, Scotland

Effect of time on clinical efficacy of topical anesthesia

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Introduction: Intraoral topical local anesthetic is used to reduce the discomfort of injection.**Objectives:** To determine the effect of time on the clinical efficacy of the topical anesthetic 5% lidocaine; to determine whether it is as effective in reducing pain in the palate upon injection compared with needle insertion alone and; to correlate pain relief and heart rate.**Methods:** This randomized, double blind, placebo controlled, split-mouth, clinical trial enrolled 90 subjects, equally divided into 3 major groups based upon time of topical anesthetic application (2, 5 or 10 minutes). Each group was further subdivided into 2 groups: needle insertion only or needle insertion with deposition of anesthetic (0.5 mL 3% mepivacaine plain) in the palate. Each subject received drug on one side of the palate and placebo on the other. Subjects recorded pain on a 100mm visual analogue scale and heart rate readings were recorded on specially designed forms.**Results:** For needle insertion only, 5% lidocaine reduced pain as determined by a significant difference in mean VAS after 2 minutes (20.1mm, $p<0.002$), 5 minutes (15.7mm, $p<0.022$) and 10 minutes (13.7mm, $p<0.04$), as analyzed by paired t-tests. For needle insertion plus injection of local anesthetic, a significant difference in mean VAS was noted only after 10 minutes (14.9mm, $p<0.031$), but not at 2 minutes (8.0mm, $p=0.2$) or 5 minutes (9.3mm, $p=0.17$) as analyzed by paired t-tests. Time of application did not result in a significant difference in effect for either needle insertion ($p=0.73$) or needle insertion plus injection of local anesthetic ($p=0.7$), as analyzed by one-way ANOVA. No conclusions were reached for the correlations between pain relief and heart rate.**Conclusion:** Topical anesthetic application relieves pain from needle insertion in the palate after any one of 2, 5 or 10 minutes of application, but requires 10 minutes in order to reduce pain from local anesthetic injection.

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