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PRAPHASRI PORNTAWEEWAT : EFFECT OF TOPICAL APPLICATION OF LIGNOCAINE TO EXPOSED HUMAN DENTINE. THESIS ADVISORS: KUTKAO VONGSAVAN, D.D.S., PETCHARAT KRAIVAPHAN, M.S., SURIN SOO-AMPON, M.S, NOPPAKUN VONGSAVAN, Ph.D. 82p. ISBN 974-662-579-9

The objective of this study in the series I experiments is to investigate the effect of topical application of 50% lignocaine to exposed human dentine *in vitro*. The experimental was carried out on twelve non caries extracted premolar teeth. They were sectioned bucco-lingually and pulp was removed from pulp chamber. The cylindrical cavity was prepared on the buccal cusp. The crown was glued with sealant to a plastic block that had a hole cut centrally, lined with a metal tube. The pulp chamber was filled through the hole in the plastic block with 0.025 ml distilled water. After the system was connected, 0.05 ml of 50% lignocaine solution was filled into the cavity, left for 10 minutes. Then the solution from pulp cavity was aspirated and the concentration of lignocaine was determined in the HPLC. The mean lignocaine concentrations were obtained under two conditions of exposed dentine with and without a smear layer were 0.2 ± 0.028 and 0.06 ± 0.013 mg/ml respectively which was significant different ($P<0.05$, *Pair-t-test*). In the series II experiments, the aim was to evaluate the efficacy of topical application of 50%lignocaine solution to exposed etch dentine on pain produced by probing and air blast stimuli in the premolar teeth *in vivo*. The tooth was isolated with a rubber dam and cylindrical shape cavity on the tip of the buccal cusp was cut with an airotor under stream of water. The exposed dentin was also etched with 35% phosphoric acid for 30 seconds to remove the smear layer, the cavity was then rinsed with distilled water and dried with cotton pellets. The baseline pain sensation of the exposed etched dentine was induced with probing and air blast, pain was assessed on 100 mm.visual analoque scale (VAS). In six teeth, the cavities were filled up with 0.05 ml of 50% lignocaine solution in sterile distilled water first (group I), the solution left in the cavity for 10 min. then it was removed and cleaned with distilled water and dried with cotton pellets. Both stimuli were applied to the exposed dentine and pain was assessed with the VAS again. The stimuli were applied to the dentine and pain was assessed every 10 min. until the subject reported no pain sensation to the stimuli and the stimuli were repeated until the subject recovered from pulpal anaesthesia.When the pain score was similar to the baseline, the control solution (distilled water) was filled into the cavity and left for 10 minutes. The stimuli were applied to the dentine and pain was assessed for another 10 minutes. In another six teeth (group II), exactly the same procedures as group I were performed but the cavity was filled with distilled water first and 50%lignocaine solution was filled into the cavity later. The results demonstrated that, in both group, the mean VAS pain score significantly decreased after 10 minutes of topical application of 50%lignocaine but not distilled water (1 way RM ANOVA, Student-Newman-Keuls). It was concluded that 50% lignocaine diffused into the pulp cavity better in case of dentine with smear layer. Pulpal anaesthesia was achieved in all cases 30 min. after topical application of 50% lignocaine to dentine *in vivo*.