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The influence of a CHX-containing etchant on bond strength

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Objectives: Although chlorhexidine (CHX) application as a therapeutic primer has been reported to preserve the hybrid layer over time due to the inhibition of endogenous MMPs, additional step in the adhesive procedure is not convenient. Therefore, incorporation of active substances into parts of the adhesive system have been proposed. The aim of this study was to investigate, by the means of microtensile bond strength test (μ TBS) and nanoleakage, the influence of 0.2% CHX incorporated within a commercially available etchant on long-term bond strength (Cloetch, Sweden&Martina – 0.2% CHX).

Materials and Methods: Extracted sound molars (N=8 teeth per group) were cut to expose middle/deep dentin surfaces. A standardized smear layer was created using a 600-grit silicon-carbide paper. Specimens were assigned to the following groups: G1) 15s etching with Cloetch+Adhese Universal (Ivoclar Vivadent); G2) 15s etching with Cloetch +AllBond Universal (Bisco); G3) 15s etching with H₃PO₄+Adhese Universal; G4) 15s etching with H₃PO₄+AllBond Universal. Bonded specimens were cut and submitted to the μ TBS in accordance with the non-trimming technique after 24 h (T0) and 12 months (T12) storage in artificial saliva at 37°C. Additionally, nanoleakage was performed (N=3 per group) at T0 and T12 to investigate silver-nitrate deposits within the hybrid layer using light microscopy.

Results

The analysis of the variance (ANOVA) showed that aging and adhesive system influence bond strength significantly ($p < 0.05$). The presence of CHX within the etchant did not provide significant differences in bond strength, immediately or over time. AllBond Universal performed slightly better at T0, but there were no differences between the adhesive systems at T12. Nanoleakage expression was not significantly different between control and experimental groups at T0 or T12. However, nanoleakage increased during aging.

Conclusions

The present study showed no influence of CHX when blended into the etchant on immediate bond strength or its stability over time.