Antimicrobial Activity and Dentin Bond Strength of Adhesive Systems
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Objectives: To evaluate the microtensile bond strength (MTBS) and the antibacterial activity of three commercial bonding agents (Gluma 2 Bond/Heraeus Kulzer, Clearfil SE Protect/Kuraray and Peak Universal Bond/Ultradent) against oral pathogens (Streptococcus mutans, Staphylococcus aureus, Enterococcus faecalis and Lactobacillus casei). Materials and Methods: For antibacterial activity (AA), 2% chlorhexidine solution was used as positive control and physiological saline solution as negative control. Bonding agents and control groups were inserted in sterilized plastic cylinders and positioned on inoculated agar plate (n=5). After incubation according to the appropriate periods of time for each microorganism, the inhibition zones were measured. Data were analyzed using one-way ANOVA and Tukey test (α=0.05). For MTBS test, occlusal enamel of human third molars was removed to expose the dentin surface. The adhesives were applied according to manufacturers' recommendations and restored with Filtek Supreme (3M ESPE). Teeth (10/group) were sectioned to obtain specimens (10-12/tooth) with cross sectional area of 1.0 mm² and then tested in a universal testing machine (EZ-Test, Shimadzu) at 0.5 mm/min after artificial saliva storage for one week (half of the specimens) and one year (remaining specimens). Results were evaluated using two-way ANOVA and Tukey post-hoc (α=0.05). Results: Clearfil SE Protect and 2% chlorhexidine solution produced inhibition zones against all oral pathogens tested, while Gluma 2 Bond and physiological saline solution did not form inhibition zone. Peak Universal Bond showed higher MTBS than Clearfil SE Protect for both evaluation times, and Gluma 2 Bond did not differ among them. Water storage for one year did not reduce the MTBS. Conclusions: The AA and the MTBS were material dependent. Storage time had no effect on the MTBS. Clinical Significance: Clearfil SE Protect may be a better alternative in restorative procedures performed on dentin, considering its better AA and stable MTBS. Supported by FAPESP (2010/13599-0 and 2011/17841-2).