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## Antimicrobial activity and evaluation of degree of conversion of adhesive systems modified by silver decorated titanium dioxide nanoparticles

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Dental adhesive systems with antibacterial properties may reduce recurrent or secondary caries. Thus, the purpose of this study was to evaluate the antibacterial effect and the degree of conversion (DC) of dental adhesives containing nanoparticles (NPs) of titanium dioxide (TiO<sub>2</sub>) or titanium dioxide decorated with silver (TiO<sub>2</sub>/Ag) using the direct-contact test and Fourier transform infrared analysis spectroscopy. The adhesive systems Single Bond, ScotchBond Multipurpose and Clearfil SE Bond were modified with 1, 2 and 5 wt% of NPs. For the direct-contact test, specimens were made using a metallic matrix and the composite resin FiltekZ250 XT, on which the dental adhesive systems were applied according to the manufacturer's instructions. The specimens were placed in a 24-well plate with 100 µL of *Streptococcus mutans* standardized suspension on their surfaces, 900 µL of BHI broth and incubated for 18 hours. A six-fold serial dilution was performed with the resultant solutions. 50 µL from each dilution was spread on brain-heart infusion agar plates and incubated for 48 hours and the colony forming units (CFU's) were registered. The data was assessed by two-way ANOVA and Tukey's Test (p<0.05). The results showed that all the systems exhibited effective antibacterial activity, regardless of the NPs used. However, no statistical difference was observed between the different concentrations and also when the three types of adhesive systems were compared. The addition of NPs did not exert any influence on the DC. These results suggest that modifying dental adhesives with antibacterial substances inhibit bacterial activity and not compromise the mechanical properties.

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