Octenidine rinsing inhibits biofilm formation and causes biofilm disruption on dental enamel *in situ*

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Aim: To evaluate the effects of octenidine (OCT) mouth rinsing on biofilm formation and moreover on the disruption of existing dental biofilms.
Methods: Biofilms were formed *in situ* by five volunteers on enamel specimens fixed to acrylic splints. For biofilm formation analysis, the volunteers intraorally exposed the splint for 48 h. Every 12 h, the OCT rinsing (0.1%) was applied for 30 s. For analysis of biofilm disruption, 48-h mature biofilms were taken as a control. Subsequently, the first OCT rinsing was performed and two pairs of specimens were evaluated. A second rinse was done 12 h after the first one. The last pairs of samples were evaluated after 72 h. The samples were analyzed by transmission electron microscopy (TEM) and fluorescence microscopy. 0.1% Chlorhexidine (CHX) was used as a positive control and water as a negative control.
Results: The fluorescence and TEM analyses showed that OCT significantly reduced bacterial adhesion and biofilm viability. Moreover, the biofilm thickness on enamel specimens was clearly reduced by OCT rinsing. Remarkably, a single application of OCT to a 48-h mature biofilm caused biofilm ultrastructure alterations and induced a substantial biofilm disruption.
Conclusions: OCT rinses induced a significant inhibition of biofilm formation comparable to the gold standard CHX. In addition, OCT had a strong biofilm disruption activity *in situ*.