THE EFFECT OF FOOD SIMULANTS ON THE BOND STRENGTH OF ORTHODONTIC ADHESIVE (AN IN VITRO STUDY)

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Abstract

Exposure to food and oral fluid simulants affects the shear bond strength of composite, ethanol being one of them. Surface micro-hardness and wear characteristics of dental composite are affected due to degradation and hydrolysis.

The effect of food simulants on the bond strength of orthodontic metal

brackets bonded to enamel with no-mix orthodontic adhesive **(advantage™)** was studied. One hundred twenty-eight extracted human premolars were selected and randomly divided into four equal groups each with 32 teeth, representing the storage media, which are distilled water (control), 50% aqueous ethanol (alcoholic food), 8% aqueous ethanol (aqueous food) and corn oil (fatty food). Then each group was

subdivided into two subgroups with 16 teeth each, representing two storage periods (1 day and 30 days).

At the end of the storage period in the immersion media the brackets were

debonded by an Instron universal testing machine to measure the shear bond strength.

After debonding each bracket base and the corresponding tooth surface were examined by a stereomicroscope and the Adhesive Remnant Index scores were recorded.

It was found immersion in the food simulants for 30 days significantly
reduces the bond strength of no-mix orthodontic adhesive (27.69% for 50% ethanol,10.06% for 8% ethanol and 6.51% for corn oil). Only 50% ethanol showed a statistically significant effect on the site of bond failure to produced more cohesive failures.

In conclusion, alcoholic mouth rinse, and alcohol-containing foods and
drinks may be a causative factor in bond failure.