Don't Count on the Fluoride in Dental Adhesives........ (7/07)


Fluoride is often included in dental adhesive formulations which suggest that the fluoride inclusion could possibly provide some therapeutic value. This present study evaluated the microtensile bond strength and laboratory caries formation on adhesive/dentin interfaces before and after secondary caries formation. Restorations were placed on the dentin surface of 80 bovine incisors using four adhesive systems with and without fluoride. The two fluoride-free systems were Single Bond (3M/ESPE, St. Paul MN) and Clearfil SE Bond (Kuraray, Tokyo Japan). The two fluoride-containing adhesive systems were Optibond Solo Plus (Sybron Dental Specialties, Orange CA) and Clearfil Protect Bond (Kuraray). The restored teeth were sectioned into multiple slabs for microtensile bond testing which had the bonded interface refined to a cross sectional area of 1 mm². Half of the specimens were subjected to secondary caries formation using a demineralization-remineralization pH cycling model while the other half was not cycled (control group). Specimens were subjected to microtensile bond strength test testing while caries lesion formation was assessed by polarized light microscopy at different distances from the adhesive-dentin bonded interface. Fluoride release during the pH cycling was also monitored. Results found that secondary caries formation significantly reduced bond strength for all adhesives (p < 0.05). Fluoride concentrations found during the pH cycling were less than 0.03 ppm, regardless of the adhesive system tested. Furthermore, bond strength values were significantly decreased after in vitro secondary caries formation. The authors concluded that the fluoride present in adhesive systems is not capable of inhibiting secondary caries or maintaining bond strength values during caries formation.

DECS Comment: Manufacturer advertisements readily mention if an adhesive contains fluoride. Although no specific claim may be explicitly stated, these advertisements imply that this fluoride content may provide some benefit. This in vitro study suggests that the fluoride content in two adhesive systems could neither prevent caries formation nor could it maintain bond strength during a laboratory caries challenge. Furthermore, this report found that the fluoride release under the conditions of this study was miniscule. The results of this report suggest that the small amount of fluoride that may be contained in adhesive systems has no therapeutic value.

References