COMMENTARY

ASSESSMENT OF IN VITRO METHODS USED TO PROMOTE ADHESIVE INTERFACE DEGRADATION: A CRITICAL REVIEW

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Degradation of adhesive interfaces has been the topic of interest in an increasing number of publications over the last few years. As detailed information on the bonding mechanism to both enamel and dentin had been extensively demonstrated and short-term tested over the years, it is not surprising that the focus has now been switched to understanding why we are able to accomplish bonding but cannot maintain it over time. This manuscript demonstrates how researchers are challenged in trying to simulate oral conditions in the pursuit of such understanding. The authors were able to compile, describe, and comment on the most frequently used methods to promote in vitro degradation of adhesive interfaces, resulting in useful information for both researchers and clinicians. It is interesting to note that regardless of the method used, water and its consequences are always playing a leading role in the degradation process. Although thermocycling could be questioned regarding the effective role of temperature change in the process of causing dimensional changes in the structure of adhesives and resins, load cycling appears to be a more representative factor influencing the longevity of restorations. NaOCl solutions have recently been used as an accelerated medium for evaluating degradation of bonds. In general, 10% NaOCl solutions are used and although the effects of the active ingredient in the resins are not clear, one should remember that 90% of the solution is water that, again, could play a role in the process of degradation of resins. The beneficial effects of chlorhexidine on the preservation of exposed collagen network have been an exciting discovery in the last few years. In vivo evidence of such benefit has been recently confirmed in permanent teeth.[1] The beauty of the approach relies on the fact that collagen degradation can be easily overcome by a simple, clinically applicable and acceptable procedure. The authors pointed out suggestions for further research in different areas, and that is appreciative from the article. The article was also successful in presenting the role of enamel on the durability of bonds. It is important to emphasize current evidence demonstrating the superiority of multistep systems versus simplified versions, particularly when enamel is no longer present at the margins. Three-step, etch-and-rinse adhesives remain the most reliable bonding procedure for both enamel and dentin. Variances of the substrate appear to more significantly affect the durability of bonds made with simplified, self-etch adhesives. The article could benefit from a critical analysis as to how such in vitro studies are related to actual practice. Why do adhesive composite restorations appear to be clinically successful for much longer periods than bonds are reported to survive in in vitro studies?[2–4] It appears that restorations can survive without perfect bonding to tooth structure. Interfacial bond failure does not necessarily mean restoration failure. If professionals respect the limitations of the materials and treat the patient integrally, then there may be less demand for a perfect, long-lasting bond.

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