

EFFECT OF RESIN MODIFIED GLASS IONOMER CEMENT ON MICROHARDNESS OF INITIAL CARIES LESIONS

Woranun Prapansilp¹, Kadkao Vongsavan¹, Praphasri Rirattanapong¹
and Rudee Surarit²

¹Department of Pediatric Dentistry, ²Department of Oral Biology,
Faculty of Dentistry, Mahidol University, Bangkok, Thailand

Abstract. Resin modified glass ionomer cement (GIC) can inhibit caries lesion formation directly adjacent to the application site but there are few studies examining the remineralization effects of resin modified GIC at other sites more remote from the application site. We conducted an *in vitro* study to evaluate the distance at which resin modified GIC is able to exert a remineralization effect on initial caries lesions from the application site. We immersed 60 bovine incisors for 24 hours in lactic acid to create artificial initial caries lesions. These teeth were then randomly divided into 2 groups of 30 teeth per group: Group 1 received no treatment (control group); in Group 2 resin-modified GIC was applied on the labial surface of the tooth. The teeth were then tested for microhardness at distances of 0.5, 1, 2 and 3 mm from where the resin modified GIC was applied. Microhardness was tested in all teeth at baseline, after initial caries lesion formation and after treatment. The mean microhardness at each site at each testing was compared using the one-way analysis of variance (ANOVA) and Tukey comparison tests. Significance was set at $p < 0.05$. After treatment, there was no significant change in microhardness value at any site tested in the control group ($p = 0.994$). However, in the resin modified GIC group after treatment, all sites tested increased significantly in microhardness ($p < 0.05$) and were significantly greater in microhardness than the control group ($p < 0.05$). In the resin modified GIC group, the mean microhardness values at 0.5 and 1 mm from the resin modified application site higher than at 2 and 3 mm ($p < 0.05$). The mean microhardness values were not significantly different in the treatment group between 0.5 mm and 1 mm and between 2 mm and 3 mm from the application site ($p > 0.05$). In this *in vitro* study, resin-modified GIC provided a remineralization effect on initial caries lesions up to 3 mm from the application site but had its greatest benefit within 1 mm from the application site.

Keywords: resin modified glass ionomer cement, microhardness, remineralization, remote site

Correspondence: Praphasri Rirattanapong,
Department of Pediatric Dentistry, Faculty of
Dentistry, Mahidol University, Yothi Road,
Bangkok 10400, Thailand.
Tel: 66 (0) 2200 7821 ext 30
E-mail: praphasri.rir@mahidol.ac.th