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Chlorhexidine and bioglass can preserve the resin-dentine bonding

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Despite all the improvements resin based dental adhesive materials have gone through, leakage in the resin-dentine interface is still a major limitation of resin based dental restorative materials. Dentine matrix metalloproteinases have been associated with this leakage through their involvement in the proteolytic degradation of the resin-dentine hybrid layer. The inhibitory effect of chlorhexidine on this enzymatic activity is well established. Bioactive glass materials can also reduce the resin-dentine interface leakage through remineralisation of the dentine.

In this study RelyXTM Unicem AplicapTM was modified by incorporating chlorhexidine and Bioglass 45S5 into the cement composition. One hundred and fifty dentine specimens were obtained from human permanent single rooted teeth and restored with the test cements. The test cements push-out bond strength was measured and statistically analysed after ageing the specimens in artificial saliva for one week and after

nine months. The matrix metalloproteinases activity was also quantified after each storage period. The study results showed that incorporating chlorhexidine and Bioglass 45S5 jointly or separately into the composition of RelyXTM Unicem AplicapTM did reduce MMP-2 activity after the short- and long-term storage. It was also shown by the results of this work that incorporating chlorhexidine and Bioglass 45S5 jointly, and chlorhexidine separately into the composition of the cement also reduced MMP-9 activity after short- and long-term storage.

Statistical analyses of the test results has shown that incorporating chlorhexidine and Bioglass 45S5 into the RelyXTM Unicem Aplicap TM cement composition significantly preserves the push-out bond strength after up to nine months of storage ($p=0.02$).

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