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Effect of type of photo-initiator in an experimental dentin bonding system on degree of conversion and microleakage of class V composite restorations: 2,3-butanedione versus comphorquinone/ amine photoinitiator systems

Zahra Khamverdi
Hamadan university of medical sciences, Iran

Aim: Addition of fillers to dental adhesives improves their mechanical properties and consequently the bond strength. This study sought to compare the effect of using 2,3- butanedione, CQ or both as photoinitiator in an experimental dentin bonding system containing PAA-g-nanoclay filler on degree of conversion (DC) of the adhesive and microleakage of class V composite restorations.

Materials and Methods: In this experimental study, 60 class V cavities were prepared on the buccal and/or lingual surfaces of extracted, sound premolar teeth and restored using an experimental dentin bonding agent and light-cure composite in three groups (n=20) as follows: Group 1: 1wt% CQ/amine, Group 2: 1wt% butanedione and Group 3: 0.5wt% CQ+ 1wt% butanedione. After thermocycling of specimens, microleakage was assessed at the occlusal and gingival margins of the restorations using dye penetration method. The DC of experimental bonding agent was calculated using Fourier transform infrared spectroscopy (FTIR). Data were analyzed using SPSS version 16 and the Kruskal Wallis, Wilcoxon, Mann Whitney U and the Fisher's exact tests (α=0.05).

Results: The degree of microleakage was not significantly different at the occlusal and gingival margins among the four groups but microleakage at the occlusal margin was significantly different from that at the gingival margin in all groups ($P<0.001$). The DC of groups 1 and 3 was significantly different from that of group 2; but the DC of groups 1 and 3 was not significantly different ($P=0.027$).

Conclusion: The results showed that using 1wt% butanedione instead of 1wt% CQ/amine in the understudy dentin adhesive system or the combination of both had no significant effect on microleakage of class V composite restorations. The DC of dentin adhesive in group 2 was significantly different from that in groups 1 and 3.

Biography

Zahra Khamverdi undertook her dentistry degree at Isfahan University of Medical Sciences in Iran. She completed her specialty in Operative and aesthetic dentistry at Isfahan University of Medical Sciences in Iran. She received the bonded aesthetic restorations fellowship from dental faculty of Hamadan University of Medical Sciences. She has been teaching at Hamadan University since 1999 to present. Her research line is dental bleaching and dental bonding systems. She has many scientific articles in these fields

zkhamverdi@yahoo.ca

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