Effect of Different Beverages on the Physical Properties of SonicFill™ Dental Composite

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Objectives: To evaluate the effect of several beverages on the physical properties (surface roughness, microhardness, and colour stability) of a new bulk-fill composite resin [SonicFill™ (Kerr Corp., USA)] over a period of time.

Methods: A total of 28 composite discs (10 mm x 2 mm) were prepared and randomly assigned into 4 groups (n=7) according to the beverages they would be immersed in. The beverages chosen were Coca-Cola® (F&N Beverages, Malaysia), Nescafe® coffee (Nestle, Malaysia), Lipton tea® (Unilever Foods, Malaysia), with distilled water as a control. Surface roughness, microhardness and colour stability were evaluated using 3D optical surface texture analyser, Vickers microhardness tester and spectrophotometer respectively. Readings were recorded at the time intervals of 24 hours, 1 week, and 1 month after immersion. The data obtained were analysed using one-way ANOVA, repeated measures ANOVA and multivariate analysis of variance (MANOVA).

Results: For surface roughness, there were significant differences for only two pairs of groups (distilled water and Coca-Cola, p = 0.002; distilled water and coffee, p = 0.024). However, there was no significant difference between the groups within the chosen time (p = 0.311). Regarding the microhardness, statistical analysis showed significant difference between time only for Coca-Cola (p = 0.008), with significant differences between 24 hours and 1 week (p = 0.024) and 24 hours and 1 month (p = 0.022). For the colour evaluation, there was significant difference between the groups within time (p = 0.000).

Conclusion: All the beverages chosen were able to affect the physical properties of the SonicFill™ composite. However, no particular beverage had a higher or lower impact on the surface roughness than the other beverages. Microhardness was affected by distilled water and Coca-Cola, in ascending order. Colour was affected by Coca-Cola, tea, and coffee, in ascending order.

Keywords: beverages, bulk-fill composite, surface roughness, microhardness, colour stability