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An In-Vitro Study on the Release of Fluoride from Two Restorative Materials and Their Rechargeability after Exposure to Daily 1000 ppm Fluoride

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Abstract:

Statement of Problem: Since the fluoride releases from materials with the property of releasing fluoride are decreasing gradually, it seems that probably the material rechargeability is more important than their long-term fluoride release. Purpose: the objective of this study was to asses the fluoride release and rechargeability of 2 types of fluoride releasing restorative materials, a resin modified glass ionomer (Vitremer) and a compomer (Compoglass F), after exposure to daily NaF solutions containing 1000 ppm F, for 1 minute. Materials and Methods: Twelve discs (8 mm × 2 mm) of each of the materials were fabricated, and divided into 2 groups (test and control). All discs were stored in 4 mL artificial saliva at 37 ° C. In group 1 (N=6), the specimens were immersed in artificial saliva which was changed daily for 25 days. In group 2 (N=6), in addition to receiving the same treatment as group 1, the specimens were immersed in NaF solution (1000ppm F, ph=6.9) for 1 minute before daily saliva change. A potentiometer was used to determine the amount of fluoride released on days 1, 2, 3, 5, 10, 15, 20 and 25, after the daily saliva change, in all study groups. Data were analyzed by the t-student test after confirmation of the equality of variances by Leven's test. Results: Both materials continued releasing fluoride throughout the whole study period. For each material, the release was highest on day one. During the first 3 days, glass ionomer released significantly higher amounts of fluoride as compared to compomer ($p < 0.05$); but afterwards, there was no significant difference between the 2 materials ($p > 0.05$). After exposure to NaF solution, none of the materials showed statistically significant rechargeability ($p > 0.05$) and the amount of fluoride-release continued to drop during the study period in similar patterns for both the test and the control groups. Conclusion: It may be concluded that rechargeability of glass ionomer and compomer, using daily neutral fluoride mouth rinses and toothpastes does not occur in reliable amounts.

Keywords:

[Fluoride release](#) . [Fluoride uptake](#) . [Resin modified glass ionomer](#) . [Compomers](#)

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