Abstract:

Investigation of the Effect of Esterpococcus Mutans Based Aging on Flexural Strength of Restorative Materials

Aim: There is not enough data about the effects of microbial aging on the mechanical properties of restorative materials; therefore, this study was aimed to compare the effect of aging by Streptococcus mutans with water induced aging on the flexural strength of various restorative materials.

Materials and Methods: This experimental study was performed on the blocks of different types of restorative materials, including a composite resin, a giomer and a resin modified glass ionomer and three types of aging was used (30-days storage in distilled water, Streptococcus mutans and germ free culture medium). The three-point bending flexural strength of the specimens before and after aging was measured according to ISO_4049 standard. Data were analyzed by one way ANOVA and Tukey post hoc tests. The significance level was set at 0.05.

Results: results showed that 30-days aging with the Streptococcus mutans significantly reduced the flexural strength in all three types of materials ($P < 0.05$). In all restorative materials, storage in a bacterial-free culture medium acted like distilled water, and there was no significant difference between the flexural strength of the material in these two solutions compared to the before-aging strength ($P > 0.05$). There was no significant difference between streptococcus mutans based aging and distilled water groups in the case of resin modified glassionomer ($P = 0.308$).

Conclusion: generally, it can be concluded that aging by streptococcus mutans in all three restorative materials reduced the flexural strength.

Keywords: restorative materials, aging, Streptococcus mutans, flexural strength.