Objectives: Toothbrush abrasion may affect the roughness of a composite restoration over time. The type of dentifrice used can enhance or degrade the degree of roughness on the restorative material. This experiment's purpose was to compare the surface roughness of composite after brushing with four different dentifrices.

Methods: Thirty-two samples (2x2x10mm) of ACTIVA™ BioACTIVE-RESTORATIVE™ composite resin were embedded in acrylic resin and polished. Samples were randomly grouped (n=8/4gp), according to dentifrice as follows: Sensodyne Complete (SC), AIM, Arm and Hammer (AH), and Crest Pro-Health (CP). Sample roughness was measured prior to and after brushing using a light interferometer (CCI Taylor Hobson). A V8 toothbrushing machine was used to brush the samples for 20,000 brushing cycles and rotated every 1,250 cycles to ensure evenness in brushing. Roughness (Ra) values were analyzed using the TalyMap Platinum software. Pre-brushing Ra differences were taken from the post-brushing value for each dentifrice. Data were compared using a one-way ANOVA with significance set at P<0.05.

Results: The average difference in roughness on ACTIVA RESTORATIVE composite was 0.069μm or 7 times rougher for specimens brushed with SC. The difference for AIM was 0.043μm or 5.9 times, 0.024μm or 1.8 times for AH, and 0.304μm or 17 times rougher for CP. CP was statistically different from all other dentifrice within this testing.

Conclusions: Polishing of composite restorations clinically helps with wear, surface roughness, and overall performance of restorations. A specific dentifrice could counteract the clinically polishing effect by contributing to a rougher surface. After brushing, none of the samples dramatically increased in roughness, indicating that the ACTIVA™ BioACTIVE-RESTORATIVE™ is a relatively adequate restorative material in regards to toothbrush abrasion. Crest Pro-Health dentifrice provided the most increase in roughness while Arm and Hammer proved to be the least abrasive dentifrice.

KEYWORDS: Resin , Erosion, Dentifrice, Toothpaste.