Original Article

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Exposure to coffee and bleaching altered surface treated lithium disilicate porcelain color and surface roughness

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Objective: This study evaluated the color and surface roughness change in autoglazed and overglazed, with or without polishing, IPS e.max Press (Ivoclar Vivadent AG,Schaan,Liechtenstein) after exposure to coffee and a bleaching agent.

Materials and methods: Ninety-six specimens (10x10x2 mm^3) were separated into 4 groups (n=24); polished autoglazed (PA), unpolished autoglazed (UA), polished overglazed (PO) , and unpolished overglazed (UO). The polished specimens were prepared using a porcelain adjustment kit (SHOFU®, Kyoto, Japan) according to the manufacture's instruction. The IPS e.max Press specimens were sent to a dental laboratory for glazing. Each group was divided into 2 subgroups; 1. Control group-The control group was immersed in distilled water. The color value changes was evaluated using a spectrophotometer (Ultrascan Pro, Hunterlab) before and after being immersed in distilled water and 2. Coffee group- exposed to coffee (Nescafe Red Cup ®, Bangkok Thailand) for 45 days before bleaching with 35% carbamide peroxide gel (Opalescense ® 35% PF). The color and surface roughness value changes were evaluated using a spectrophotometer and surface roughness tester (Alicona,Itasca,USA) respectively, before and at 45 days of coffee immersion and after bleaching. The SPSS 24 statistical software was used for analyzing the data. The paired-T test was applied to determine significant differences in color and surface roughness changing of the IPS e.max Press surface treatment groups and analysis of variance using the F-test if the results showed a normal distribution.

Results: There was a significant difference in the color change in all surface treatment groups after bleaching. There was no significant difference in color between the polished and unpolished groups. Comparing the autoglazed and overglazed groups, there were significant differences only between the unpolished groups. There was a significant difference in the surface roughness value in all groups, except between the exposed to coffee and exposed to the bleaching agent in the unpolished group and between the initial and exposed to coffee in the overglazed group.

Conclusions: Exposure to coffee and water affected the color change of all groups. Exposure to coffee affected the surface roughness of the autoglazed group. Bleaching affected the color change of coffee groups and affected the surface roughness of the polished autoglazed and polished overglazed groups. In the polished autoglazed and polished overglazed groups, glazing did not affect the color change, but affected the surface roughness.

Keywords: bleaching, coffee, color changes, IPS e.max Press, surface roughness

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Introduction

Currently, tooth-colored restorations are typically placed for esthetic reasons. Some studies reported that tooth-colored restorations can be stained by foods and beverages, especially coffee [1]. Drinking coffee has become more popular since 1999 in America [2]. Tooth bleaching

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