Evaluation and comparison of the adhesion of Streptococcus mutans on auto glazed and chair side polished surfaces of two feldspathic ceramics

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Introduction: Adjustment of ceramic restorations either before or after cementation results in surface roughness which leads to adherence of Streptococcus mutans.

Methodology: 60 circular ceramic discs, 30 of each material, IPS e max Ceram (Ivoclar Vivadent AG. Schaan) and IPS d. SIGN (IvoclarVivident AG. Schaan) were fabricated. To simulate chairside adjustments, all the specimens were abraded for a minute with Shofu yellow finishing diamond points. Six groups were made. (10 specimens per group) i.e. IPS e max Ceram: Group A1 (auto glazed), Group A2 (polished with optrafine), Group A3 (control). IPS d SIGN: Group B1 (auto glazed), Group B2 (polished with optrafine), Group B3 (control). The surface roughness of each specimen was assessed before incubation with S. mutans for 48 hours at 37°C with Brain Heart Infusion broth. After sonication and dilution, adherent bacteria were plated for quantification using the plate count method to assay for colony forming units (CFUs). Statistical analysis was performed using 1 way anova and Post Hoc Test. RESULTS: SEM evaluation showed that chairside adjusted surfaces have the roughest surface and highest S. Mutans adhesion in both the dental ceramics and Surface polished with optrafine polishing kit had lesser bacterial adhesion. CFUs (cells/mL) of S mutans were significantly highest for chairside adjusted IPS d SIGN (5.70E+03) followed by chairside adjusted IPS e max Ceram (4.25E+03) . Glazed IPS d SIGN (6.56E+02), followed by Glazed IPS e max Ceram (6.31E+02). Least bacterial adhesion was noted with optrafine polished specimens; IPS d SIGN (1.52E+02) followed by IPS e max Ceram (1.38E+02).

Result: SEM evaluation showed that chairside adjusted surfaces have the roughest surface and highest S. Mutans adhesion in both the dental ceramics and Surface polished with optrafine polishing kit had lesser bacterial adhesion. CFUs (cells/mL) of S mutans were significantly highest for chairside adjusted IPS d SIGN (5.70E+03) followed by chairside adjusted IPS e max Ceram (4.25E+03) . Glazed IPS d SIGN (6.56E+02), followed by Glazed IPS e max Ceram (6.31E+02). Least bacterial adhesion was noted with optrafine polished specimens; IPS d SIGN (1.52E+02) followed by IPS e max Ceram (1.38E+02).

Conclusion: Polished surfaces of both ceramics showed less bacterial adhesion compared to autoglazed surfaces. However, there is no significant difference in adhesion of S. mutans on both the ceramic systems.

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