

GEORGIAN MEDICAL NEWS

No 1 (346) 2024

**INFLUENCE OF AGING, BEVERAGES, AND MOUTH WASH SOLUTIONS ON THE
MICROSTRUCTURAL AND COLOR STABILITY OF DIFFERENT DENTAL CERAMICS:
AN IN VITRO STUDY**

Abstract:

Purpose: To evaluate the influence of aging, beverages, and mouthwash solutions on the microstructural and color stability of three CAD/CAM ceramic materials.

Materials and Method: In total, 87 specimens ($7 \times 5 \times 1.5$ mm) were prepared from 3 CAD/CAM ceramic groups, Lithium Disilicate glass ceramic (IPS e.max CAD), Extra translucent zirconia (VITA YZ), and Resin Nanoceramic (Cerasmart 270). All the materials were A2 or equivalent shades. After hydrothermal aging in distilled water at 5 C to 55 C for (10.000 cycles). The samples were randomly allocated into 3 groups (n=27) and immersion (staining) for one week in 3 different solutions coffee, green tea, and chlorhexidine. The baseline measurements of ceramic discs were recorded for color change and 2 samples of each group sent for SEM (microstructure) images before aging and staining. The second measurement was recorded after 10000 thermocycling and immersion in staining agents for 7 days. Statistical analysis were performed with an independent Kruskal-wallis test . The significant level was set at $P \leq 0.05$.

Results: ΔE values for lithium Disilicate after immersion in coffee, green tea and chlorhexidine gluconate were 3.167, 1.847 and 2.022, respectively. corresponding ΔE values for VITA XT were 3.438, 4.201 and 2.267. meanwhile Cerasmart shows more sensitivity for staining than LD and VITA of 4.454, 2.926 and 2.933.

Conclusion: within limitation of this study lithium disilicate showed the best color stability with values less than perception threshold. VITA and Cerasmart show higher sensitivity for staining with VITA more affected by green tea (Higher than clinically accepted threshold) and Cerasmart more affected by coffee (higher than clinically accepted threshold).