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Color and translucency of microwave-sintered pre-colored dental monolithic zirconia ceramics

Sung-Hun Kim and Hee-Kyung Kim

Seoul National University, South Korea

Ajou University, South Korea

Purpose: The purpose of this study was to compare the optical properties of pre-colored dental monolithic zirconia ceramics of various thicknesses sintered in a microwave and a conventional furnace.

Materials & Methods: A2-shade of pre-colored monolithic zirconia ceramic specimens (22.0×22.0 mm) in 3 thickness groups of 0.5, 1.0 and 1.5 mm were divided into 2 subgroups according to the sintering methods (n=9): Microwave and conventional sintering. Spectrophotometer was used to obtain CIELab color coordinates and translucency parameters and CIEDE2000 color differences (ΔE_{00}) were measured. The relative amount of monoclinic phase (X_m) was estimated with X-ray diffraction. Statistical analyses were conducted with two-way ANOVA ($\alpha=0.05$).

Results: There were small interaction effects on CIE L^* , a^* and TP between sintering method and thickness ($P<0.001$): L^* (partial eta squared $\eta_p^2=0.115$), a^* ($\eta_p^2=0.136$) and TP ($\eta_p^2=0.206$), although higher b^* values were noted for microwave sintering regardless of thickness. Color differences between two sintering methods ranged from 0.52 to 0.96 ΔE_{00} units. The X_m values ranged from 7.03% to 9.89% for conventional sintering and from 7.31% to 9.17% for microwave sintering.

Conclusions: Microwave-sintered pre-colored dental monolithic zirconia ceramics can exhibit similar color perception and translucency to those by conventional sintering with reduced processing time.

Biography

Sung-Hun Kim has received DDS and his Dental training in Korea and PhD in England. He is a Professor of Department of Prosthodontics at Seoul National University Dental School. He has published more than 100 papers in reputed journals and has been serving as an Editor-In-Chief of *Journal of Advanced Prosthodontics*.

ksh1250@snu.ac.kr