ABSTRACT

Purpose: The purpose of this in vitro study was to comparatively evaluate the masking ability of lithium disilicate ceramic with different core thickness on the shade match of indirect restorations over metallic substrate.

Materials and Methods: A total of 30 heat pressed lithium disilicate ceramic discs of low translucency were fabricated with diameter 10mm and thickness of 1 mm, 1.3 mm and 1.6mm with each thickness consisting of 10 samples to be used in the study. Thirty metal discs of diameter 10mm were cast from Ni-Cr alloy pellets and sandblasted with 50µm Aluminium oxide to simulate metallic substrates. The colour coordinates of the lithium disilicate ceramic disc were measured against white background using a spectrophotometer. The influence of Ni-Cr metal discs on the colour parameters of Lithium disilicate ceramic discs were measured after optically connecting with distilled water before cementation. Then the surface of lithium disilicate discs were acid etched and cemented to metal discs using Maxcem Elite resin luting agent maintaining the cement space at 40 µm. The colour differences of the three groups of ceramic discs over metallic substrate are calculated using CIE LAB system.

Results: The mean colour difference (ΔE) of Group I before and after cementation with the Ni-Cr metal discs was 17.32 and 16.32 respectively. The mean colour difference (ΔE) of Group II before and after cementation with the Ni-Cr metal discs was 13.01 and 12.10 respectively. The mean colour difference (ΔE) of Group III before and after cementation with the Ni-Cr metal discs was 11.73 and 11.05 respectively.

Conclusion: Within the limitations of the study, the mean colour difference of Group I, Group II and Group III lithium disilicate ceramic discs against Ni-Cr metal disc before and after cementation was found to be statistically significant. Group III (1.6mm) exhibited the lowest ΔE, followed by Group II and the highest ΔE value with the Group I. The mean colour difference of the three groups were found to be more than the clinically acceptable perceptibility threshold (ΔE < 3.3) indicative of reduced masking ability of all the three groups of ceramic discs over metallic substrate used in this study.

Key words: Heat press ceramic, lithium disilicate, Ni-Cr, colour difference, Spectrophotometer, L*a*b*, masking ability, translucency.