COLOR DEGRADATION OF FACIAL SILICONES: A COMPARATIVE STUDY BETWEEN MEDICAL GRADE AND FOOD GRADE FACIAL SILICONES

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ABSTRACT

Craniofacial rehabilitation is a complex process in restoration of a craniofacial structure; congenital deformities, secondary to trauma, may result from a disease process and/or its treatment. To restore the defect, surgical reconstruction, prosthetic rehabilitation or a combination of both can be used to treat a deformed patient. Silicone elastomers are the most widely used materials for fabrication of facial prostheses. The goal is to achieve a predictable restoration of the patient's appearance and protection of the resection site, allowing enhancement in confidence to help the patient live as normal a life as possible. It is important that prostheses will maintain appearance over the service lifetime. The gradual discoloration of prostheses because of environmental factors is a major concern. In Thailand, due to hot weather and high humidity, the color stability may be shortened. Prostheses may need to be re-fabricated more often; thus, the treatment cost is increased as per number of prosthesis change. The purpose of this study was to compare color degradation of medical grade and food grade silicones when exposed to environmental effects for different times to get information in selecting proper facial silicones.

Eight groups of MDX 4-4210 and VST-50 elastomers were prepared and mixed with yellow silicone fluid colorant. The specimens were exposed to 4 conditions: control, heat, humidity and UV-light for a period of 0, 240, 720, 1440, and 3528 hours. CIE L*a*b* values were measured by spectrophotometer. The color differences (ΔE^*) of both facial silicones were subjected to three-factor ANOVA with repeated measures. Mean values were compared with Game-Howell intervals calculated at the 0.05 significance level.

The result of this study revealed environmental effects and exposure times influenced the change of color (ΔE^*) of both facial silicone at a level of statistical significance ($P<0.05$). UV light and moisture had the most effect on the change of color in both silicones. VST-50 changed color faster than MDX4-4210.

KEY WORDS: MEDICAL GRADE AND FOOD GRADE FACIAL SILICONES, THE CHANGE OF COLOR, ENVIRONMENTAL EFFECTS, EXPOSURE TIMES

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