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Ministry of Higher Education
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College of Dentistry

EFFECT OF KAPPA CARRAGEENAN POWDER ADDITION ON *STAPHYLOCOCCUS EPIDERMIDIS* ADHESION AND SOME MECHANICAL PROPERTIES OF ROOM TEMPERATURE VULCANIZED MAXILLOFACIAL SILICONE

A Thesis
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Abstract

Background: Maxillofacial silicone is the most acceptable and mostly used material in maxillofacial prostheses fabrication but still beyond the ideal material. It has some problems with antimicrobial efficiency. This present aimed to add kappa-carrageenan powder which is a plant extract material to maxillofacial silicone and evaluate its efficacy against *Staphylococcus epidermidis* and measuring some mechanical properties to insure that there were no adverse effects on the mechanical properties of the maxillofacial silicone after addition.

Materials and methods: A total of 120 specimens of room temperature vulcanized maxillofacial silicone VST50 was used and the κ-carrageenan powder was added as the antibacterial agent with selected percentages of 1wt.% and 2wt.% according to results obtained from pilot study. Bcterial adhesion test was used to evaluate the antibacterial efficacy of the kappa carrageenan by counting the adherent bacterial cells, while tear strength test, shore A hardness and surface roughness tests used to evaluate the effect on the mechanical properties. Each test done with 10 specimens for each percentage and control groups. The data were analyzed using one-way ANOVA tests which was considered statistically significant at a level of $p < 0.05$.

Results: There was a highly significant decrease of adherent bacterial cells in comparison with control group with the lowest mean value was obtained with the 2 wt.% addition group followed by the 1 wt.% addition group in comparison with the control group. There was highly significant increase in tear strength with the highest mean value was to the 1 wt.% addition group, followed by the 2 wt.% addition group and then control group. Also highly significant increase in hardness with the highest value for the 1 wt.% addition group, then the 2 wt.% addition group with non-significant difference between them. Finally, there was highly significant increase in surface roughness with the highest value for the 2

wt.% addition group, then the 1 wt.% addition group with non-significant difference between them.

Conclusion: The κ-carrageenan powder is an effective antibacterial agent against *S. epidermidis.* And can be added to VST50 room temperature vulcanized maxillofacial silicone to decrease the adherent bacterial cells on its surface with both percentages, and 2wt.% is more effective than 1wt.% with enhancement of tear strength and hardness while more surface roughness but in the accepted rang.

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تاثير اضافة مسحوق الكابا كراجينان على التصاق المكورات العنقودية البشروية وبعض الخصائص الميكانيكية لمادة السليكون المفلكن بدرجة حرارة الغرفة لتعويضات الوجه والفكين

رسالة
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