The effect of autoclave processing on some properties of heat cured denture base materials.

A thesis

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Abstract

Statement of problem: Although most of the physical and mechanical properties of denture base resin polymerized by the conventional heat polymerization have been studied, the effect of autoclave processing in these properties has not been fully determined.

Purposes: the aim of the present study is to investigate the effect of two different cycles of autoclave processing on the transverse strength, impact strength, surface hardness and the porosity of two acrylic denture base materials.

Materials and methods: Vertex and High Impact Acryl were the two heat-cured acrylic denture base material included in the study. A total of 240 specimens were prepared. For each material, the specimens were grouped into: Control groups (Group A) in which acrylic resins processed by conventional water- bath processing technique (74°C for 1.5 hours then boil for 30 minutes) and experimental groups in which acrylic resins processed by autoclave at 121°C,210KPa.The experimental groups were divided into Group B(Fast) for15min. , and Group C (Slow) for 30min... To study the effect of the autoclave processing **(Tuttnauer 2540EA)**, four tests were conducted transverse strength (Instron universal testing machine), impact strength (charpy tester), surface hardness (shore D), and porosity test. The results were analyzed to ANOVA, LSD, and independent T-test.

Results: In Vertex, there were no significant differences between the results of the processing techniques regarding transverse, impact, and hardness tests. To compare the results of the processing techniques in High Impact Acryl, there were highly significant differences regarding transverse, impact,

and hardness tests. In both acrylic denture base materials used, there were a highly significant difference in porosity test results.

Conclusions: The autoclave processing technique might also be a good alternative to the conventional water bath processing technique. Regarding to autoclave processing technique, the slow (long) curing cycle provide better denture bases material including the tested physical and mechanical properties as compared with the fast (short) curing cycle. In autoclave processing technique, High Impact Acryl proved to be better in producing denture bases with good physical and mechanical properties examined in this study as compared to Vertex.