ABSTRACT

Acrylic resin is one of the most popular materials in dentistry, and it has been the only polymeric denture base material for many years. However, residual monomer (methyl methacrylate) in acrylic resin may cause irritation of the oral mucosa. On the other hand, polyester EBP-2421, a polymeric material for statues can be also manipulated to denture base. The objective of the study is to determine the possibility of polyester to be an alternative material for acrylic resin.

The main study is to analyze the biocompatibility of polyester EBP-2421. The biocompatibility tests include toxicity, carcinogenicity, teratogenicity, and hipersensitivity. Microbiological, chemical, and physical mechanical tests are also conducted to complete the study.

This research uses true experimental design with macroscopic and microscopic observations. Biocompatibility tests are carried out on *Rattus norvegicus* and cell culture, while microbiological, chemical, and physical mechanical tests are conducted on strips of the tested materials.

Gas chromatographic analysis of polyester EBP-2421 proves no concentration of residual monomer is detected, and hydrolisis does not occur in the oral cavity. Statistical analysis shows that this material does not cause toxic, carcinogenic or teratogenic effects. There is a possibility of a mild hypersensitivity caused by polyester EBP-2421, and small colonies of *Candida albicans* adhere on the surface of this polymer. Physical mechanical properties of polyester EBP-2421 is lower than acrylic resin *Stellon* ($p < 0.05$), but the

addition of silica 2.5 % improves the transverse strength, shear strength, and hardness of polyester EBP-2421.

Based on the results of this study, it can be concluded that polyester EBP-2421 is highly possible to be used as denture base material in the future. Other biocompatibility test, such as mutagenicity test is required to get a recommendation as a denture base material from the Council of Dental Materials and Devices.

Key words : Polyester - Denture base material - Residual monomer - Biocompatibility