



ABSTRACT

RAHMI SOLIHAT. In Vitro Analysis of Biphasic Calcium Phosphate and Hydroxyapatite as Bone Implants. Supervised by KIAGUS DAHLAN and BOY M. BACHTIAR.

Hydroxyapatite (HA) and Biphasic Calcium Phosphate (BCP) are widely used as bone implant materials because of its biocompatibility. The minimum requirement of biocompatible materials is nontoxic. The reduction of MTT (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide) to a purple formazan is used to measure toxicity of implant materials that exposed to the cell. The biocompatibility also can be observed from the attachment between cell and implant materials under electron microscope. This research reported that HA and BCP derived from eggshell using precipitation and hydrothermal method were nontoxic. MTT toxicity analysis was held during 1, 2 and 3 days immersion of HA and BCP on MG63-osteoblast cells. The viability cells immersed with HA and BCP were higher than 100% for 1, 2, and 3 days which were 476.12%, 380.60%, 182.59% and 307.21%, 128.36%, 155.47% respectively. This result means that HA and BCP were categorized as nontoxic and induced the cells to grow. The viability cells were decreased as longer immersion time because of osteocalcifications that secret protein collagen were appeared. This MTT analysis result was appeared in a good agreement with Scanning Electron Microscope (SEM) characterization, that showed the attachments of either HA or BCP to the osteoblast cells after 1 day immersion. The SEM photos after incubated 3 days showed that cells start to calcify and secret protein. The calcification and secretion of protein collagen performed much better after 14 days immersion. In conclusion, HA and BCP derived from eggshell were nontoxic and performed good adhesion interaction to the host cells *in vitro*.

Keywords: *hydroxyapatite, biphasic calcium phosphate, in vitro, MTT analysis, SEM*