Cytotoxicity Test of Bovine Demineralized Bone Matrix on Human Mesenchyme Stem Cell using MTT Assay

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Background
The use of bone graft in Indonesia is increasing each year. Autograft remains as a gold standard but has many limitations. Demineralized bone matrix (DBM) as bone graft substitute provides several advantages, including unlimited sources and lower price. At present, Tissue Bank of Dr. Soetomo hospital still developing its own bovine DBM however no research about the cytotoxicity was done.

Objective
To determine the cytotoxicity of bovine DBM to human mesenchyme stem cells (MSCs).

Method
This was an experimental study with a total sample of 48, divided into control and case group (50% and 25%DBM). MSCs was cultured and added with 50% and 25% DBM. The cell viability was then measured using MTT Assay. Data was processed using normality test and homogeneity test, and analyzed using comparative test with independent t-test. The cut off for cytotoxicity is 60% viable cells on comparison with the control.

Results
Mean optical density (OD) of control group was 0.656 ± 0.021 (range 0.620-0.696) and 0.565 ± 0.022 (range 0.529-0.614) dan 0.520 ± 0.022 (range 0.461-0.552) for case group 50% and 25% respectively. The result was statistically significant between control and case group with p value less than 0.05. The mean cell viability of case group was above 60%.

Conclusions
No cytotoxicity effect of bovine DBM to Human MSCs

Keywords : Bone graft, Mesenchyme stem cells, Bovine Demineralized Bone Matrix, viability, cytotoxicity