

Potency, Characteristic, and Differentiation of Iliac Crest Bone Marrow-Derived Mesenchymal Stem Cell of Systemic Lupus Erythematosus Patients Complicated with Avascular Necrosis of Femoral Head

Ismail Hadisoebroto Dilogo^{1,2*}, SukryAsdar Putra Hasibuan³

¹Staff of Department of Orthopaedic and Traumatology Department, Faculty of Medicine Universitas Indonesia – CiptoMangunkusumoHospitalJl.Diponegoro No.71, Salemba, Jakarta Pusat, 10430 Indonesia

²Head of Stem Cells Medical Technology Integrated Service Unit, Cipto Mangunkusumo Hopsital-Faculty of Medicine Universitas Indonesia CMU 2 Building 5th floor ,Jl.Diponegoro No.71, Salemba, Jakarta Pusat, 10430 Indonesia

³Resident of Department of Orthopaedic and Traumatology Department, Faculty of Medicine Universitas Indonesia – CiptoMangunkusumoHospitalJl.Diponegoro No.71, Salemba, Jakarta Pusat, 10430 Indonesia

Abstract : Introduction. Mesenchymal stem cells (MSC) are very promising in the field of tissue engineering because it is multipotent, rapidly proliferates, with high ability to regenerate bone marrow. BM-MSC(Bone Marrow Mesenchymal Stem Cell) may be the treatment of choice for avascular necrosis (AVN) of femoral head that affects many systemic lupus erythematosus (SLE) patients in recent times. BM-MSC of SLE patients has phenotype, proliferation, and differentiation impairments. MSC therapy on femoral head AVN from autologous donors was reported to deliver good outcome and safety. This study aims to determine the potency, characteristics, and differentiation of BM-MSC in patients with SLE and their relation with age.

Methods. This is an in vitro study that examined four subjects of SLE patients in Cipto Mangunkusumo Hospital. BM-MSC of SLE patientswasisolated, expanded and differentiated. Pearson and Spearman correlation test were used as statistical analysis.

Results. The mean of confluent cell numbers was $7.44 \times 10^5 \pm 3.06 \times 10^5$ cells/ml, mean of confluent time was 20.75 ± 4.99 days, median of adipogenic differentiation time was 17.5 days (range 14-21), osteogenic and chondrogenic differentiation time was 21 days. There were positive correlation between patient's age with confluence time ($p < 0.001$) and negative correlation with MSC confluence cell count ($p < 0.001$).

Conclusion. BM-MSC from iliac crest of SLE patients can be isolated, proliferated and differentiated. BM-MSC from SLE patients has longer confluence and differentiation time and lower confluence cell count.

Keywords: bone marrow derived mesenchymal stem cells, systemic lupus erythematosus, isolation, proliferation, differentiation.