

## ABSTRAK

*Hematopoietic stem cell* (HSC) merupakan sel *pluripotent* yang memiliki kemampuan untuk memperbarui diri atau *self-renewing*. Kemampuan tersebut dipengaruhi oleh mediator *Tumor Nekrosis Factor- $\alpha$*  (TNF- $\alpha$ ) dengan dosis yang bervariasi. TNF- $\alpha$  berperan dalam pengaktifan HSC melalui kondisi homing yang kemudian akan membentuk *fibroblast-like cell* HSC. Penelitian ini bertujuan untuk mengetahui pengaruh pemberian TNF- $\alpha$  *high dose* terhadap jumlah *fibroblast-like cell* HSC.

Penelitian ini menggunakan jenis penelitian eksperimen invitro rancangan *post test only control group*, dilakukan dengan menggunakan kelompok kontrol dan 3 (tiga) kelompok perlakuan. HSC diinkubasi selama 16 jam kemudian diberi TNF- $\alpha$  *high dose*, sehingga didapatkan 4 sampel, yaitu kelompok I (kontrol tidak diberi TNF- $\alpha$ ), kelompok II (HSC diberi TNF- $\alpha$  dosis 250 ng/ml), kelompok III (HSC diberi TNF- $\alpha$  dosis 200 ng/ml), kelompok IV (HSC diberi TNF- $\alpha$  dosis 150 ng/ml), kemudian dilanjutkan penghitungan jumlah *fibroblast-like cell* hari kelima pada 5 lapang pandang menggunakan mikroskop inverted perbesaran 100 kali.

Didapatkan hasil rerata jumlah *fibroblast-like cell* kelompok I 9,2; kelompok II 12,4 $\pm$ 1,67; kelompok III 13,4 $\pm$ 3,43; kelompok IV 10,4 $\pm$ 4,72. Berdasarkan hasil uji *Saphiro-wilk test* didapatkan hasil kelompok I 0,777; kelompok II 0,314; kelompok III 0,334; kelompok IV 0,389. Keempat kelompok uji semuanya memiliki distribusi data normal karena memiliki nilai  $p > 0,05$ . Varian data keempat kelompok homogen, ditunjukkan dengan nilai  $p=0,249$  ( $p>0,05$ ). Uji *one way anova* menghasilkan nilai sig (p) sebesar 0,179 ( $p > 0,05$ ), menunjukkan tidak ada perbedaan jumlah *fibroblast-like cell* HSC pada keempat kelompok uji.

Dari uraian diatas, dapat disimpulkan bahwa pemberian serum TNF- $\alpha$  *high dose* tidak berpengaruh terhadap jumlah *fibroblast-like cell* HSC.

Kata Kunci : *hematopoietic stem cell, fibroblast-like cell hematopoietic stem cell, TNF- $\alpha$  high dose*

## Effect of the High Dose of TNF- $\alpha$ on the Number of Hematopoietic Stem Cell Derived Fibroblast-Like Cell

### ABSTRACT

**Introduction** : Hematopoietic stem cell is one of stem cell is capable of producing various kinds of blood cells. Proliferation and differentiation of hematopoietic stem cells are affected by Tumor Necrosis Factor- $\alpha$  (TNF- $\alpha$ ). A high dose administration of TNF- $\alpha$  has been shown activate the Nuclear factor-kappa B (NF- $\kappa$ B), (a factor regulating the transcription of genes in hematopoietic stem cell activation). Activated hematopoietic stem cells, will generate the fibroblast-like cell. This study aimed to determine the effect of high dose TNF- $\alpha$  on the number of fibroblast-like cells derived from hematopoietic stem cell.

**Method** : An experimental in vitro study using a post test only control group design. Hematopoietic stem cells incubated for 16 hours, were divided into 4 groups; group I (control), group II (TNF- $\alpha$  at the dose of 250 ng/ml) , group III (TNF- $\alpha$  at the dose of 200 ng/ml), group IV (TNF- $\alpha$  at the dose of 150 ng/ml). On day 5, the hematopoietic stem cell cultures were evaluated for their number of fibroblast-like cells using the microscope inverted with five microscopic fields of view at 100X magnification. The data were analyzed by one-way ANOVA.

**Results** : The average number of fibroblast-like cells hematopoietic stem cells for the control group ( $9.20 \pm 1.48$ ), treatment groups (TNF- $\alpha$  250 ng / ml ( $10,4 \pm 4,72$ ), TNF- $\alpha$  200ng / ml ( $13,4 \pm 3,43$ ), TNF- $\alpha$  150 ng / ml ( $12,4 \pm 1,67$ ) were respectively. There was significant different in among the groups, a value sig ( $p < 0.05$ ).

**Conclusion** : The high dose TNF- $\alpha$ , has no affect on number of fibroblast-like cell derived from hematopoietic stem cells.

**Keywords** : fibroblast-like cells, hematopoietic stem cells, TNF- $\alpha$ .