

Efek Paparan Radiasi Gamma Terhadap Sel Hematopoietik pada Sumsum Tulang

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ABSTRAK

Radioterapi merupakan pengobatan kanker dengan menggunakan sumber radiasi eksternal yang bertujuan merusak DNA di inti kromosom sel kanker sehingga terjadi nekrosis. Apabila radiasi mengenai sumsum tulang belakang sebagai tempat pembentukan sel darah akan mengganggu sirkulasi sistem hematopoietik. Besarnya pengaruh radiasi gamma terhadap menurunnya kuantitas sel hematopoietik masih belum banyak diketahui sehingga perlu dilakukan telaah lebih lanjut untuk mengetahui efek paparan radiasi gamma dan pemberian ekstrak *P. niruri* terhadap menurunnya kuantitas sel hematopoietik yaitu sel CD34⁺ dan sel B220⁺ pada sumsum tulang. Pada penelitian ini digunakan lima variasi dosis radiasi yaitu, 100 rad, 200 rad, 300 rad, 400 rad, dan 500 rad serta pemberian ekstrak *P. niruri* menggunakan dosis tunggal yaitu 250 mg/kg BB. Dosis radiasi yang diberikan sebesar 100 rad per hari dan pemberian ekstrak *P. niruri* dilakukan selama 14 hari sebelum radiasi dan selama radiasi dilakukan. Jumlah dan analisis sel CD34⁺ dan B220⁺ pada sumsum tulang dihitung menggunakan Flow cytometer. Berdasarkan hasil penelitian didapatkan bahwa pemberian paparan radiasi gamma dapat menurunkan jumlah sel yang diamati, yaitu penurunan sel CD34⁺ dan sel B220⁺ seiring dengan besarnya dosis radiasi yang diberikan. Pemberian ekstrak *P. niruri* menghambat penurunan sel hematopoietik melalui peningkatan jumlah absolut sel CD34⁺ pada sumsum tulang.

Kata kunci: Radiasi Gamma, Hematopoietik, *Phyllanthus niruri* L.

ABSTRACT

Radiotherapy is a treatment for cancer which use external radiation sources with the aim to damage the DNA in the nucleus of the cancer chromosomes and cause necrosis of cancer cells. The exposure of radiation to the spinal cord as the site of blood cell formation would change the hematopoietic circulation system. The effect of gamma radiation exposure on decreasing of hematopoietic cells quantity is still unknown and it needs further experiment to determine the effect the radiation and the effect of *P. niruri* extract giving on the reduction of immune cells quantity which are CD34⁺ and B220⁺ cells in the bone marrow. In this experiment, five variations of the dose radiation was used. The dose were 100 rad, 200 rad, 300 rad, 400 rad and 500 rad and use single dose of *P. niruri* as much 250 mg/kg BB. The dose of 100 rad radiation was given daily and *P. niruri* extract was given for 14 days before and during radiation. The amount of the CD34⁺ and B220⁺ cells is counted and analyzed by Flow cytometry. The result of this experiment showed that the giving of gamma ray irradiation reduced the amount of immune cells in the bone marrow. The increasing radiation dose was caused increasing of the reduction of cells immune quantity. The giving of *P. niruri* extract inhibits hematopoietic cell through increasing of the absolut amount of CD34⁺ cell in the bone marrow.

Key word: Gamma Radiation, Hematopoietic, *Phyllanthus niruri* L.

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