

ABSTRAK

POTENSI *CONDITIONED MEDIUM* ASAL SEL PUNCA MESENKIMAL TERHADAP PERBAIKAN KONDISI HEWAN MODEL ATEROSKLEROSIS: KAJIAN HISTOLOGI AORTA

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Aterosklerosis merupakan keadaan terjadinya penebalan akibat timbunan lemak berupa kolesterol pada pembuluh darah aorta. *Conditioned medium* (CM) mengandung sekretom yang merupakan hasil sekresi sel punca yang memiliki potensi sebagai agen terapi untuk pengobatan aterosklerosis karena mampu merangsang proses regenerasi jaringan yang rusak. Penelitian ini bertujuan untuk mengetahui potensi CM asal sel punca mesenkimal pada perbaikan kondisi hewan model aterosklerosis dengan menggunakan kelinci *New Zealand White* jantan (*Oryctolagus cuniculus*) sebagai hewan model aterosklerosis dengan induksi pakan tinggi lemak.

Sebanyak 30 ekor kelinci dibagi menjadi lima kelompok. Kelompok A (kelompok kontrol) dan kelompok B hingga E (kelompok perlakuan pakan tinggi lemak). Pada minggu ke-4, kelompok B diinjeksikan NaCl dengan dosis 0,1 ml/kg BB, kelompok C,D, dan E diinjeksikan CM dengan dosis secara berurutan 0,05 ml/kg BB, 0,1 ml/kg BB, dan 0,2 ml/kg BB secara intraperitoneal dan dilakukan sekali seminggu hingga minggu ke-7. Sampel organ aorta diambil pada minggu ke-4,5,6,7. Sampel difiksasi selama 24 jam menggunakan larutan *Bouin's*, dan proses dilanjutkan menggunakan metode parafin. Jaringan dipotong dengan ketebalan 5 μ m, lalu diwarnai menggunakan pewarnaan *Hematoxylin-eosin*. Hasil dianalisis secara kualitatif dengan melihat ketebalan tunika intima yang ditimbulkan akibat adanya plak.

Hasil penelitian menunjukkan adanya perbaikan pada struktur histologi aorta setelah diinjeksikan CM selama empat minggu. *Conditioned medium* asal sel punca mesenkimal memiliki potensi terhadap perbaikan kondisi aterosklerosis pada pembuluh darah aorta hewan model kelinci, yang ditandai dengan menurunnya rata-rata total LDL darah kelinci dan terjadi perbaikan histologi aorta yang tampak pada hilangnya pembengkakan pada dinding aorta, serta tidak ditemukan adanya akumulasi lemak pada intima dan tunika media.

Kata kunci : Aorta, aterosklerosis, *conditioned medium*, *hematoxylin eosin*, histologi

ABSTRACT

THE POTENCY OF CONDITIONED MEDIUM FROM MESENCHYMAL STEM CELL IN IMPROVING THE CONDITION OF AN ANIMAL MODEL OF ATHEROSCLEROSIS: AORTA HISTOLOGICAL STUDY

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Atherosclerosis is a condition of thickening of the aortic blood vessels due to fat deposits in the form of cholesterol. Conditioned medium (CM) contains secretome which is the result of stem cell secretion which has the potential as a regenerative agent for the treatment of atherosclerosis because it is able to stimulate the regeneration process of damaged tissue. This study aims to determine the potential of conditioned medium (CM) from mesenchymal stem cells in improving the condition of an animal model of atherosclerosis using male *New Zealand White* rabbits (*Oryctolagus cuniculus*) as an animal model of atherosclerosis with a high fat induced diet.

A total of 30 rabbits were divided into five groups. Group A (control group) and groups B to E (high fat diet treatment group). At week 4, group B was injected with NaCl at a dose of 0.1 ml/kg body weight, groups C, D, and E were injected with CM at a dose of 0.05 ml/kg body weight, 0.1 ml/kg body weight, respectively, then 0.2 ml/kg body weight intraperitoneally and performed once a week until the 7th week.

Aortic organ samples were taken at weeks 4,5,6, and 7. The sample was fixed for 24 hours using Bouin's solution, and the process was continued using the paraffin method. The tissue was cut with a thickness of 5 μ m, then coloured using *Hematoxylin-eosin*. The results were analyzed qualitatively by looking at the thickness of the tunica intima caused by the presence of plaque.

The results showed an improvement in the histological structure of the aorta after CM was injected for four weeks. Conditioned medium from mesenchymal stem cells has the potential to improve atherosclerotic conditions in aortic blood vessels in a rabbit model, which is identified by a decrease in the average total LDL of rabbit blood and an improvement in aortic histology as seen in the disappearance of swelling in the aortic wall, and there is no fat accumulation was found in the tunica intima and tunica media.

Key words : Aorta, atherosclerosis, conditioned medium, hematoxylin eosin, histology