ABSTRAK

POTENSI *MESENCHYMAL STEM CELL-CONDITIONED MEDIUM* TERHADAP PERBAIKAN STRUKTUR HISTOLOGIS AORTA KELINCI *NEW ZEALAND WHITE* (*Oryctolagus cuniculus*) MODEL ATEROSKLEROSIS DENGAN PEWARNAAN *MALLORY'S ANILINE BLUE*

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Aterosklerosis merupakan suatu kondisi terjadinya pengerasan dan penyempitan arteri secara progresif yang dapat berujung pada iskemia dan kematian. Perubahan fenotip sel otot polos pembuluh darah dari kontraktil ke sintetik, diikuti dengan mekanisme *multiple* yang bersifat proinflamatori, memainkan peran penting dalam perkembangan proses aterogenesis. *Mesenchymal Stem Cell-Conditioned Medium* (MSC-CdM) diketahui memiliki faktor parakrin yang dapat memberikan efek terapeutik pada jaringan yang terkena aterosklerosis. Penelitian ini bertujuan untuk mengetahui potensi MSC-CdM terhadap perbaikan struktur histologis aorta kelinci melalui pengaruhnya pada serabut kolagen. Tiga puluh ekor kelinci *New Zealand White* (*Oryctolagus cuniculus*) jantan berat ±250 gram dibagi ke dalam lima kelompok secara acak. Kelompok kontrol normal (A) diberi pakan standar. Kelompok kontrol positif (B) diberi diet aterogenik dan diinjeksi 0,1 ml/kg BB NaCl. Kelompok perlakuan (C, D, E) diberi diet aterogenik dan diinjeksi MSC-CdM dengan dosis berurutan 0,05 ml/kg BB, 0,1 ml/kg BB, dan 0,2 ml/kg BB secara intraperitoneal. Pemberian diet aterogenik dilakukan sehari sekali selama 4 minggu, kemudian dilanjutkan terapi MSC-CdM seminggu sekali selama 4 minggu. Pada minggu ke-8, kelinci dieutanasi dan dilakukan pengambilan sampel aorta, kemudian diwarnai menggunakan pewarnaan *Mallory's Aniline Blue*. Hasil penelitian menunjukkan adanya perbaikan struktur histologis aorta berupa berkurangnya ketebalan tunika intima dan kepadatan serabut kolagen pada kelompok hewan yang diterapi menggunakan MSC-CdM. Dosis MSC-CdM 0,05 ml/kg BB memberikan hasil terbaik dalam perbaikan struktur histologis aorta yang mendekati gambaran kontrol normal. Kesimpulan dari penelitian ini adalah MSC-CdM memiliki potensi sebagai pengobatan aterosklerosis.

Kata kunci : Aterosklerosis, *conditioned medium*, kolagen, *mallory's aniline blue*

ABSTRACT

POTENTIAL OF MESENCHYMAL STEM CELL-CONDITIONED MEDIUM ON IMPROVING HISTOLOGICAL STRUCTURE OF AORTA IN NEW ZEALAND WHITE RABBITS (*Oryctolagus cuniculus*) AS AN ATHEROSCLEROSIS MODEL USING MALLORY'S ANILINE BLUE STAINING

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Atherosclerosis is a progressive condition characterized by the narrowing and hardening of arterial blood vessels, leading to potential ischemia and mortality. The phenotypic transition of vascular smooth muscle cells from a contractile to a synthetic state, along with pro-inflammatory mechanisms, plays a crucial role in the development of atherogenesis. Mesenchymal Stem Cell-Conditioned Medium (MSC-CdM) has been found to possess paracrine factors that can exert therapeutic effects on atherosclerotic tissues. This study aimed to investigate the potential of MSC-CdM in improving the histologiscal structure of the rabbit aorta, focusing on its impact on collagen fibers. Thirty male New Zealand White rabbits (*Oryctolagus cuniculus*) weighing approximately ±250 grams were randomly divided into five groups. The normal control group (Group A) received a standard diet. The positive control group (Group B) was fed an atherogenic diet and injected with 0.1 ml/kg body weight of NaCl. The treatment groups (Groups C, D, E) received the atherogenic diet and intraperitoneal injections of MSC-CdM at successive doses of 0.05 ml/kg, 0.1 ml/kg, and 0.2 ml/kg, respectively. The atherogenic diet was administered once daily for four weeks, followed by MSC-CdM therapy once a week for an additional four weeks. At the end of the eighth week, the rabbits were euthanized, and aortic samples were collected and stained using Mallory's aniline blue staining. The results revealed substantial improvements in the histologiscal structure of the aorta, characterized by reduced intima thickness and collagen fiber density in the group of animals treated with MSC-CdM. Among the different doses tested, the administration of 0.05 ml/kg of MSC-CdM showed the most promising outcomes, closely resembling the histologiscal appearance of the normal control group. In conclusion, this study demonstrates the potential of MSC-CdM as a viable therapeutic approach for atherosclerosis treatment.

Key words : Atherosclerosis, conditioned medium, collagen, mallory's aniline blue