

INTISARI

POLA DISTRIBUSI *BASIC FIBROBLAST GROWTH FACTOR* (bFGF) PADA LUKA BAKAR KULIT TIKUS PUTIH YANG DIBERI EKSTRAK MEDIA PENUMBUH SEL PUNCA MESENKIMAL (EMPSPM)

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Penelitian mengenai peranan *basic fibroblast growth factor* (bFGF) dalam proses regenerasi luka bakar kulit normal yang diberi ekstrak media penumbuh sel punca mesenkimal (EMPSPM) sebagai terapi luka bakar belum pernah dilaporkan. Penelitian ini bertujuan untuk mengetahui keberadaan dan pola distribusi *basic fibroblast growth factor* (bFGF) dalam proses regenerasi luka bakar yang diberi krim EMPSPM secara topikal.

Empat puluh delapan tikus wistar (*Rattus norvegicus*) berumur 2 bulan dibagi menjadi kelompok Bioplacenton[®] dan kelompok krim EMPSPM. Tikus dianastesi menggunakan Ketamine 10% dan Xylazine 2% dengan dosis 75 mg dan 5 mg/kg berat badan. Kepala paku berdiameter 1 cm dipanaskan dan ditempelkan di dorsal tubuh tikus selama 5 detik sehingga didapatkan luka bakar derajat III. Luka bakar kelompok kontrol positif diberi Bioplacenton[®] sedangkan kelompok perlakuan diberi krim EMPSPM secara topikal, dua kali sehari. Diameter luka bakar diukur setiap 5 hari setelah luka. Sampel kulit tikus diambil pada jam ke-4, hari ke-2, 5, 10, 15, 20, 25 dan 30 setelah luka. Sampel difiksasi dengan larutan Bouin dan diproses dengan metode parafin. Potongan jaringan kulit dengan ketebalan 5 μ m divisualisasikan dengan 3 pewarnaan yaitu, *Masson's trichrome*, hematoksin eosin (HE), dan imunohistokimia metode *polymer based-immunohistochemistry*. Rabbit anti-bFGF (1:100; Bioss, USA) digunakan sebagai antibodi primer dan Kit N-Histofine[®] simple stain rat MAX PO dengan kromogen N-Histofine[®] DAB-2 (Nichirei Biosciences Inc., Japan) digunakan sebagai detektor visual. Hasil pewarnaan dianalisis secara deskriptif, semi kuantitatif dan kuantitatif.

Imunoreaktivitas bFGF terdeteksi pada makrofag, fibroblas, dan sel endotel yang tersebar di tepi dan tengah luka dermis. Jumlah sel yang imunoreaktif terhadap bFGF meningkat signifikan pada jam ke-4, hari ke-2, 10, 15, 20, 25, dan 30 setelah luka pada kelompok krim EMPSPM dibanding dengan kelompok Bioplacenton[®]. Imunoreaktivitas bFGF yang lebih tinggi dengan intensitas yang kuat dan distribusi yang luas mempercepat proses regenerasi luka bakar kulit kelompok krim EMPSPM yang teramati pada : 1) penyempitan diameter luka bakar yang lebih cepat, 2) jumlah fibroblas yang lebih banyak, 3) kepadatan serabut kolagen yang lebih tinggi, dan 4) jumlah pembuluh darah yang lebih banyak dibanding kelompok Bioplacenton[®].

Kata kunci : luka bakar, EMPSPM, bFGF, *Masson's trichrome*, imunohistokimia

ABSTACT

THE DISTRIBUTION PATTERN OF BASIC FIBROBLAST GROWTH FACTOR (bFGF) IN SKIN BURN WOUND OF WHITE RATS TREATED WITH MESENCHYMAL STEM CELL CONDITIONED MEDIUM (MSC-CM)

by
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The role of basic fibroblast growth factor (bFGF) in the regeneration of normal skin burn wound regeneration treated with mesenchymal stem cell-conditioned medium (MSC-CM) has not reported yet. The objective of this study was to investigated the presences and distibution pattern of basic fibroblast growth factor (bFGF) in burn wound regeneration treated with MSC-CM cream topically.

Forty-eight of two months old Wistar rats (*Rattus norvegicus*) were divided into Bioplacenton[®] treated group and MSC-CM cream treated group. Rats were anesthetized using combination of Ketamine 10% and Xylazine 2%, at the dose rate of 75 mg/kg and 5 mg/kg body weight, respectively. 1 cm diameter of nail head was burned and put down on dorsal area of each rat for 5 second until full-thickness burn wound was created. Bioplacenton[®] treated group was treated with Bioplacenton[®] while treatment group was treated with MSC-CM cream twice a day, respectively. Burn wound size was measured every 5 day after wounded. Skin wound tissues were collected on the hour of 4, day of 2, 5,10, 15, 20, 25 and 30 after wounded. Skin wound tissues were fixed in Bouin solution and processed with paraffin-embedded method. 5- μ m thickness of tissue samples were visualized by using Masson's trichrome stain, hematoxyline-eosin (HE) stain and immunohistochemistry of polymer-based immunohistochemistry method. Rabbit anti-bFGF (1:100; Bioss, USA) were used as primary antibody and N-Histofine[®] *simple stain rat* MAX PO Kit with N-Histofine[®] DAB-2 chromogen (Nichirei Biosciences Inc., Japan) were used as visual detector. Results were analyzed descriptively, semi-quantitatively and quantitatively.

Immunoreactivity of basic fibroblast growth factor (bFGF) were detected in macrophages, fibroblasts, and edothelial cells and were distributed on the edge and center dermis of wound area. The number of bFGF immunoreactive cell increased significantly on the hour of 4, day of 2, 10, 15, 20, 25, and 30 after wounding in MSC-CM cream treated group compared to Bioplacenton[®] treated group. Intense immunoreactivity of bFGF and his extensive distribution accelerate burn wound regeneration, as indicated by : 1) acceleration of wound closure, 2) greater numbers of fibroblasts, 3) high density of collagen fibers, and 4) greater numbers of blood vessels in MSC-CM cream treated group compared to Bioplacenton[®] treated group.

Keyword : burn wound, MSC-CM, bFGF, Masson's trichrome, immunohistochemistry