

SKRIPSI SARJANA FARMASI
UJI AKTIVITAS ANTIBAKTERI SEDIAAN PRA-GEL PATCH FILM
MENGANDUNG SECRETOME MESENCHYMAL STEM CELLS (MSC)
TERHADAP ISOLAT KLINIS *Staphylococcus aureus*

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ABSTRAK

UJI AKTIVITAS ANTIBAKTERI SEDIAAN PRA-GEL PATCH FILM MENGANDUNG SECRETOME MESENCHYMAL STEM CELLS (MSC) TERHADAP ISOLAT KLINIS *Staphylococcus aureus*

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Meningkatnya resistensi antibakteri mendorong perlunya pengembangan agen antibakteri alternatif yang efektif dan aman. Sekretom *Mesenchymal Stem Cells* (MSC) diketahui mengandung berbagai biomolekul bioaktif, seperti peptida dan sitokin, yang berpotensi memberikan aktivitas antibakteri. Penelitian ini bertujuan untuk mengevaluasi aktivitas antibakteri sediaan *patch film* yang mengandung sekretom MSC terhadap isolat klinis *Staphylococcus aureus*. Tiga isolat *S.aureus* diperoleh dari pasien ulkus kaki diabetikum di RSUP Dr. M. Djamil Padang kemudian diisolasi dan diidentifikasi menggunakan media diferensial dan sistem VITEK 2. Aktivitas antibakteri diuji menggunakan metode difusi sumuran terhadap formulasi sebelum proses pengeringan (*pra-gel*) pada konsentrasi sekretom MSC 10%, 15%, dan 20%. Hasil pengujian menunjukkan bahwa seluruh formulasi menghasilkan zona hambat terhadap ketiga isolat *S.aureus*. Zona hambat tertinggi diperoleh pada isolat ketiga, yaitu sebesar 1,91 mm; 2,75 mm; dan 4,24 mm pada konsentrasi 10%, 15%, dan 20%. Diameter zona hambat meningkat seiring dengan peningkatan konsentrasi sekretom MSC, tetapi seluruhnya masih tergolong dalam kategori lemah. Hasil penelitian menunjukkan bahwa sekretom MSC yang diformulasikan dalam sediaan *patch film* memiliki aktivitas antibakteri yang terbatas terhadap isolat klinis *S.aureus*. Aktivitas yang terbatas diduga berkaitan dengan pelepasan biomolekul aktif dari matriks polimer yang belum optimal sehingga jumlah komponen bioaktif yang mencapai bakteri menjadi berkurang.

Kata kunci: Sekretom, *mesenchymal stem cell*, *patch film*, aktivitas antibakteri, *Staphylococcus aureus*, isolat klinis

ABSTRACT

ANTIBACTERIAL ACTIVITY TESTING OF A PRE-GEL PATCH FILM FORMULATION CONTAINING MESENCHYMAL STEM CELL (MSC) SECRETOME AGAINST CLINICAL ISOLATES OF *Staphylococcus aureus*

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The increasing prevalence of antibacterial resistance highlights the need for the development of effective and safe alternative antibacterial agents. Mesenchymal Stem Cell (MSC) secretome is known to contain various bioactive biomolecules, such as peptides and cytokines, which have potential antibacterial properties. This study aimed to evaluate the antibacterial activity of an MSC secretome-loaded patch film against clinical isolates of *Staphylococcus aureus*. Three *S.aureus* isolates were obtained from diabetic foot ulcer patients at Dr. M. Djamil General Hospital, Padang, and were subsequently isolated and identified using differential media and the VITEK 2 system. Antibacterial activity was evaluated using the agar well diffusion method on formulations prior to the drying process (pre-gel) containing MSC secretome concentrations of 10%, 15%, and 20%. The results showed that all formulations produced inhibition zones against the three *S.aureus* isolates. The largest inhibition zones were observed in the third isolate, measuring 1.91 mm, 2.75 mm, and 4.24 mm at MSC secretome concentrations of 10%, 15%, and 20%, respectively. The inhibition zone diameter increased with increasing MSC secretome concentration; however, all inhibition zones were classified as weak. These findings indicate that MSC secretome formulated into a patch film possesses limited antibacterial activity against clinical isolates of *S.aureus*. The limited activity may be associated with the suboptimal release of bioactive biomolecules from the polymer matrix, resulting in a reduced amount of active components reaching the bacteria.

Key words: Secretome, *mesenchymal stem cell*, *patch film*, antibacterial activity test, *Staphylococcus aureus*, clinical isolates