

ABSTRAK

Lupus Eritematosus Sistemik (LES) merupakan penyakit autoimun kronis dengan inflamasi sistemik dan kerusakan multi organ, yang prevalensinya masih tinggi terutama di negara berkembang seperti Indonesia. Penyakit ini didominasi oleh wanita usia produktif dan berdampak signifikan terhadap aspek sosial ekonomi. Patogenesis LES ditandai oleh disregulasi sistem imun, peningkatan sel plasma autoreaktif, serta produksi autoantibodi seperti anti-dsDNA yang berkorelasi dengan keparahan klinis. Salah satu sitokin proinflamasi yang berperan penting adalah Interleukin-17A (IL-17A), yang memicu aktivasi dan diferensiasi sel B menjadi sel plasma. Oleh karena itu, IL-17A berpotensi menjadi target terapi melalui pendekatan imunomodulasi.

Penelitian ini bertujuan untuk membuktikan bahwa vaksin kinoid IL-17A mampu memperbaiki regulasi sistem imun melalui penurunan jumlah sel plasma lien dan kadar anti-dsDNA serum pada mencit model Pristane-Induced Lupus (PIL). Penelitian menggunakan desain eksperimen murni *in vivo* dengan rancangan randomized post-test only controlled group design. Sebanyak 26 mencit Balb/c betina digunakan dan dibagi menjadi kelompok kontrol negatif, kontrol positif, serta tiga kelompok perlakuan dengan dosis vaksin kinoid IL-17A sebesar 125 µg/ml, 250 µg/ml, dan 500 µg/ml yang diberikan secara intramuskular sebanyak tiga kali. Jumlah sel plasma lien diukur menggunakan flow cytometry dengan penanda CD19⁺CD38⁺, sedangkan kadar anti-dsDNA serum diukur menggunakan ELISA. Analisis statistik dilakukan menggunakan One Way ANOVA dan korelasi Pearson. Hasil menunjukkan bahwa vaksin kinoid IL-17A menurunkan jumlah sel plasma dan kadar anti-dsDNA secara signifikan, dengan efek optimal pada dosis 250 µg/ml. Dosis yang lebih tinggi menunjukkan kecenderungan penurunan efek. Terdapat korelasi positif kuat antara jumlah sel plasma dan kadar anti-dsDNA ($r = 0,708$; $p = 0,000$).

Kesimpulan penelitian ini menunjukkan bahwa vaksin kinoid IL-17A efektif memperbaiki regulasi sistem imun pada mencit model PIL, sehingga berpotensi dikembangkan sebagai pendekatan terapeutik pada LES.

Kata Kunci: Lupus Eritematosus Sistemik; Interleukin-17A; Vaksin kinoid; Pristane-Induced Lupus; Sel plasma; Anti-dsDNA

ABSTRACT

Systemic Lupus Erythematosus (SLE) is a chronic autoimmune disease characterized by systemic inflammation and multi-organ damage, with a high prevalence particularly in developing countries such as Indonesia. The disease predominantly affects women of productive age and has significant socio-economic impacts. The pathogenesis of SLE is marked by immune system dysregulation, increased numbers of autoreactive plasma cells, and the production of autoantibodies such as anti-double-stranded DNA (anti-dsDNA), which correlate with clinical severity. One of the key proinflammatory cytokines involved in SLE pathogenesis is Interleukin-17A (IL-17A), which promotes the activation and differentiation of B cells into plasma cells. Therefore, IL-17A represents a potential therapeutic target through immunomodulatory approaches.

This study aimed to demonstrate that an IL-17A kinoid vaccine is able to improve immune regulation by reducing the number of splenic plasma cells and serum anti-dsDNA levels in a Pristane-Induced Lupus (PIL) mouse model. This research employed a true experimental in vivo design using a randomized post-test only controlled group design. A total of 26 female BALB/c mice were used and divided into a negative control group, a positive control group, and three treatment groups receiving intramuscular injections of the IL-17A kinoid vaccine at doses of 125 µg/ml, 250 µg/ml, and 500 µg/ml, administered three times.

The number of splenic plasma cells was measured using flow cytometry with CD19⁺CD38⁺ surface markers, while serum anti-dsDNA levels were quantified using ELISA. Statistical analysis was performed using One-Way ANOVA and Pearson correlation. The results demonstrated that the IL-17A kinoid vaccine significantly reduced plasma cell numbers and serum anti-dsDNA levels, with the optimal effect observed at a dose of 250 µg/ml. Higher doses showed a tendency toward reduced efficacy. A strong positive correlation was found between plasma cell numbers and anti-dsDNA levels ($r = 0.708$; $p = 0.000$).

In conclusion, the IL-17A kinoid vaccine effectively improves immune regulation in the PIL mouse model and shows potential as a therapeutic approach for SLE.

Keywords: *Systemic Lupus Erythematosus; Interleukin-17A; Kinoid vaccine; Pristane-Induced Lupus; Plasma cells; Anti-dsDNA*