ABSTRAK

Dekade terakhir, hasil terapi pasien Lupus Eritematosus Sistemik (LES) yang dilakukan kurang optimal termasuk dalam menghambat kerusakan ginjal serta menimbulkan efek samping terutama infeksi. Pengobatan utama LES masih befokus pada glukokortikoid dan imunosupresan jangka panjang yang memiliki efek samping besar. *Nigella sativa* merupakan obat berbahan dasar alami yang terbukti memiliki efek antiinflamasi dan dapat memodulasi sistem imun pada pasien autoimun. Penelitian ini bertujuan untuk mengevaluasi mekanisme dan pengaruh pemberian ekstrak nigella sativa terhadap hambatan kerusakan organ ginjal pada mencit model lupus. Penelitian *true experimental* dengan *randomized post test only control group design* menggunakan 60 mencit BALB/c betina, 6-8 minggu, BB 20-30gram. Mencit dibagi 5 kelompok: K(-) (mencit sehat), K(+) (MML tanpa perlakuan), plasebo (MML+Na CMC 0,2%), Steroid (MML+prednison 1 mg/kgBB) dan *N.sativa* (MML+*N.sativa* 4,8 g/kgBB atau setara thymoquinone 10,8 mg/kgBB). Penelitian ini menilai derajat kerusakan ginjal dengan variabel antara ekspresi IL-6, IL-17, IL-23, Jumlah absolut Sel Treg, dan Kadar anti-dsDNA. Analisis statistik menggunakan *Software Statistical Product and Service Solution* (SPSS) versi 25. Efek Model lupus terhadap biomarker (IL-6, IL-17, IL-23, Sel Treg, kadar anti-dsDNA) dan kerusakan ginjal berbeda signifikan dengan P<0,001 (P<0,05). Efek perlakuan terhadap seluruh biomarker dan kerusakan ginjal didapatkan berbeda signifikan (p<0,001) dengan perbedaan biomarker kelompok *N.sativa* terhadap steroid IL-6 (p<0,05), IL-23 (p<0,05), Treg (p<0,05), Antibodi anti-dsDNA (p<0,05), dan Kerusakan ginjal (p<0,05). Analisis regresi kategorikal menunjukkan efek *N.sativa* dalam menghambat kerusakan jaringan ginjal pada mencit model lupus sangat kuat (B= -0,982) dengan mekanisme hambatan paling kuat melalui jalur IL-23 dan ds-DNA (B= -0,593). Pemberian ekstrak *N.sativa* terbukti dapat menurunkan ekspresi IL-6, IL-23, IL-17, dan kadar antibodi anti-dsDNA serta menaikkan jumlah absolut Treg sehingga menghambat kerusakan ginjal pada mencit model lupus. Ekstrak *N.sativa* menghambat kerusakan ginjal melalui penurunan IL-23 yang berpengaruh pada penurunan antibodi anti-dsDNA.

Kata Kunci : Lupus Eritematosus Sistemik, *Nigella sativa*, Kerusakan ginjal.

ABSTRACT

In the last decade, the therapeutic result in Systemic Lupus Erythematosus (SLE) patient has been less than optimal incuding in inhibiting kidney damage and causing side effects, especially infection. The mainstay of SLE treatment focuses on long-term glucocorticoids and immunosuppressants which have major side effects. Nigella sativa is a natural based medicine that has been shown to have anti-inflammatory effects and can modulate the immune system in autoimmune patients. However, the mechanism and effect of N.sativa on prevent kidney damage is not clear yet. The purpose of our study to evaluate the mechanism and effect of extract N. sativa on prevention of kidney damage in lupus mice model. A true experimental study with a randomized post test only control group design using 60 female BALB/c mice, 6-8 weeks, 20-30gram weight. Mice were divided into 5 groups: K(-)(healthy mice), K(+) (MML without treatment), placebo (MML+Na CMC 0.2%), steroids (MML+prednisone 1 mg/kg BW) and N.sativa (MML+N.sativa 4.8 g/kg BW or equivalent thymoquinone 10.8 mg/kg BW). This study assessed the degree of kidney damage with IL-6, IL-17, IL-23 expression, the absolute number of Treg cells, and anti-dsDNA levels as an intermediate variables. Statistical analysis using Statistical Product and Service Solution (SPSS) software version 25. The effect of the lupus model on biomarkers (IL-6, IL-17, IL-23, Treg cells, anti-dsDNA levels) and kidney damage was significantly different with P<0.001 (P<0.05). The effect of treatment on biomarkers (IL-6, IL-17, IL-23, Treg cells, anti-dsDNA levels) and kidney damage was significantly different (p<0.001) with differences N.sativa group against steroids biomarkers is IL-6 (p<0.05), IL-23 (p<0.05), Treg (p.<0.05), anti-dsDNA antibodies (p<0.05), and kidney damage (p<0.05). Categorical regression analysis showed that the effect of N.sativa in inhibiting kidney tissue damage in lupus mice was very strong (B= -0,982) with the strongest inhibition mechanism through IL-23 and ds-DNA pathways (B= -0.593). The administration of N.sativa extract was proven to reduce the expression of IL-6, IL-23, IL-17, and anti-dsDNA antibody levels however, increase the absolute amount of Treg to inhibit kidney damage in lupus mice model. N.sativa extract inhibits kidney damage by decreasing IL-23 which affects decreasing the anti-dsDNA antibodies.

Keywords: *Systemic Lupus Erythematosus, Nigella sativa, Kidney damage*.