

PENGARUH PENURUNAN KADAR ASAM URAT DARAH TERHADAP KERUSAKAN GINJAL PADA MENCIT MODEL HIPERURISEMIA

KAJIAN *GLOMERULAR INJURY SCORE*, *ARTERIOLAR INJURY SCORE*, EKSPRESI ENOS, EKSPRESI MCP-1, DAN RASIO MAKROFAG M1/M2 DI GINJAL

INTISARI

Latar Belakang : Hiperurisemia diketahui berhubungan dengan berbagai penyakit metabolik, penyakit kardiovaskuler dan penyakit ginjal. Hiperurisemia berkontribusi terhadap disfungsi endotel, aktivasi sistem RAS, peningkatan stres oksidatif, dan respon sistem imun dan inflamasi yang maladaptif. Semua itu akan menyebabkan kerusakan ginjal. Penelitian ini bertujuan untuk melihat efek penurunan kadar asam urat darah terhadap perbaikan kerusakan ginjal pada mencit model hiperurisemia.

Metode : Penelitian ini menggunakan hewan coba 25 ekor mencit jantan yang dibagi dalam 5 kelompok. Diberikan perlakuan injeksi asam urat untuk menimbulkan hiperurisemia dan selanjutnya diberikan alopurinol untuk menurunkan kadar asam urat darah. Pada akhir perlakuan diperiksa kadar serum asam urat, *Glomerular Injury Score* (GIS) dan *Arteriolar Injury Score* (AIS) dengan pewarnaan PAS, ekspresi eNOS dan MCP-1 dengan *Reverse Transcriptase-PCR* (RT-PCR), rasio makrofag M1/M2 dengan pewarnaan imunohistokimia anti CD68 dan anti Arginase I. Data dianalisis dengan uji *one way ANOVA* dan uji *Kruskall-Wallis*.

Hasil : Kelompok AU7AL7 dan AU14AL7 secara bermakna memiliki kadar asam urat darah, GIS, AIS, ekspresi MCP-1, dan rasio makrofag M1/M2 yang lebih rendah dibandingkan dengan kelompok AU7 dan AU14 ($p < 0,05$). Nilai ekspresi eNOS kelompok AU7AL7 dan AU14AL7 secara bermakna lebih tinggi dibandingkan kelompok AU7 dan AU14 ($p < 0,05$).

Kesimpulan : Penurunan kadar asam urat darah secara bermakna mengurangi kerusakan ginjal yang terjadi pada mencit model hiperurisemia.

Kata Kunci : asam urat, alopurinol, kerusakan ginjal, ekspresi eNOS, ekspresi MCP-1, rasio makrofag M1/M2.

EFFECT OF LOWERING BLOOD LEVELS OF URIC ACID IN RENAL DAMAGE OF HIPERURICEMIC MICE MODEL

STUDY OF *GLOMERULAR INJURY SCORE*, *ARTERIOLAR INJURY SCORE*, ENOS
EXPRESSION, MCP-1 EXPRESSION, AND MACROPHAGES M1/M2 RATIO IN KIDNEY

ABSTRACT

Background: Hyperuricemia is known to be associated with various metabolic disease, cardiovascular disease and kidney disease. Hyperuricemia contribute to endothelial dysfunction, activation of the RAS system, increased oxidative stress, and maladaptive immune system response. All of it will cause kidney damage. This study aims to look at the effect of decreasing the blood uric acid levels to repair kidney damage in mice models of hyperuricemia.

Methods: This study used 25 male mice that divided into 5 groups. We used uric acid injection to cause hyperuricemia and then given allopurinol to lower blood uric acid levels. At the end of the treatment, we measured serum uric acid, Glomerular Injury Score (GIS) and arteriolar Injury Score (AIS) with PAS staining, eNOS and MCP-1 expression with Reverse Transcriptase-PCR (RT-PCR), macrophage M1/M2 ratio with anti-CD68 and anti arginase I immunohistochemistry staining. Data were analyzed with one way ANOVA test and Kruskal-Wallis test.

Results: AU7AL7 and AU14AL7 group had a significantly lower blood uric acid levels, GIS, AIS, MCP-1 expression, and macrophage M1/M2 ratio than the AU7 and AU14 group ($p < 0.05$). eNOS expression in AU14AL7 and AU7AL7 group were significantly higher than AU7 and AU14 group ($p < 0.05$).

Conclusion: Decrease in blood uric acid levels were significantly reduce kidney damage that occurs in mice models of hyperuricemia.

Keywords: uric acid, allopurinol, kidney damage, eNOS expression, MCP-1 expression, macrophage M1/M2 ratio.