

## INTISARI

### PENGARUH PEMBERIAN VITAMIN D3 TERHADAP KADAR SERUM ALBUMIN, EKSPRESI mRNA TOLL-LIKE RECEPTOR 2 (TLR2), DAN CIDERA TUBULUS PADA MODEL TIKUS HIPERURISEMIA

**Latar Belakang :** Kondisi hiperurisemia menginduksi terjadinya cedera ginjal dengan meningkatkan reaksi inflamasi pada ginjal dari jalur *Danger Associated Molecular Pattern* dan juga aktivasi TGF- $\beta$ . Cedera pada podosit juga terinduksi pada kondisi hiperurisemia. Beberapa penelitian menunjukkan bahwa vitamin D memiliki sifat renoprotektif yang dapat mengurangi dampak buruk hiperurisemia.

**Tujuan :** Mengkaji pengaruh pemberian vitamin D terhadap kadar serum albumin, ekspresi mRNA TLR2, dan cedera tubulus pada cedera ginjal sebagai efek kondisi hiperurisemia.

**Metode :** Asam urat 125 mg/kgBB/hari diberikan dengan injeksi intraperitoneal pada mencit Swiss jantan untuk menginduksi kondisi hiperurisemik selama 7 hari (kelompok AU7, n = 6) dan 14 hari (kelompok AU14, n = 6). Vitamin D 0,5 $\mu$ g / KgBW / hari diberikan secara intraperitoneal setelah 14 hari induksi asam urat (AU14D7, n = 6) selama 7 hari. Kelompok kontrol diinjeksi NaCl selama 7 hari (Kontrol, n = 6). Kadar albumin serum diukur sebelum tikus diterminasi, PCR digunakan untuk mengukur ekspresi TLR2 mRNA, dan cedera tubular dilihat dengan pewarnaan PAS. Data dianalisis menggunakan software SPSS versi 25.

**Hasil :** Kondisi hiperurisemia menurunkan kadar albumin serum, meningkatkan ekspresi TLR2 mRNA, dan menyebabkan cedera tubular. Vitamin D menyebabkan kadar albumin serum menjadi lebih tinggi secara signifikan ( $p < 0,05$ ) pada AU14D7 dibandingkan dengan kelompok AU7 dan AU14. Vitamin D juga menyebabkan ekspresi mRNA TLR2 lebih rendah secara signifikan pada kelompok AU14D7 dibandingkan dengan kelompok AU7. AU14D7 mendemonstrasikan atenuasi cedera tubular berdasarkan pewarnaan PAS.

**Kesimpulan :** Vitamin D meningkatkan kadar serum albumin, menurunkan ekspresi mRNA TLR2 dan memperbaiki cedera tubulus.

**Kata Kunci :** hiperurisemia, vitamin D, serum albumin, *Toll-Like Receptor 2*, cedera tubulus

## ABSTRACT

### EFFECT OF VITAMIN D3 TO SERUM ALBUMIN LEVEL, mRNA EXPRESSION OF TOLL-LIKE RECEPTOR 2, AND TUBULAR INJURY IN HYPERURICEMIC MICE MODEL

**Background:** The hyperuricemic condition induces renal injury by increasing the inflammatory reaction in the kidneys from the Danger Associated Molecular Pattern pathway and also activation of TGF- $\beta$ . Injury to the podocytes is also induced in hyperuricemic condition. Several studies have shown that vitamin D has renoprotective properties that can reduce the adverse effects of hyperuricemia.

**Purpose:** To elucidate the effect of vitamin D administration on serum albumin levels, TLR2 mRNA expression, and tubular injury in renal injury as an effect of hyperuricemic condition.

**Methods:** Uric acid 125mg/kgBW/day was given with intraperitoneal injection into male Swiss mice to induce hyperuricemic condition for 7 days (AU7 group, n=6) and 14 days (AU14 group, n=6). Vitamin D 0,5 $\mu$ g/KgBW/day were administrated intraperitoneally after 14 days of uric acid induction (AU14D7, n=6) for 7 days. Control group was injected with NaCl for 7 days. Serum albumin level was measured before terminating the mice, PCR was used to quantify TLR2 mRNA expression, and tubular injury was seen with PAS staining. Data were analysed using SPSS version 25 software.

**Result:** Hyperuricemic condition decreased serum albumin levels, increased TLR2 mRNA expression, and induced tubular injury. Vitamin D caused the serum albumin levels to be higher significantly ( $p < 0.05$ ) in AU14D7 compared to AU7 and AU14 group. Vitamin D also caused TLR2 mRNA expression to be lower significantly in AU14D7 groups compared to AU7 group. The AU14D7 demonstrated the attenuation of tubular injury based on PAS stain.

**Conclusion:** Vitamin D increased serum albumin levels, decreased TLR2 mRNA expression and attenuated tubular injury.

**Keywords:** hyperuricemia, vitamin D, albumin, Toll-Like Receptor 2, tubular injury