INTISARI

Pengaruh Pemberian Calcitriol terhadap Cedera Tubulus dan Ekspresi *Toll-Like Receptor 4* (TLR4) pada Ginjal Mencit dengan *Unilateral Ureteral Obstruction*

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Latar Belakang: Penyakit ginjal kronis (PGK) adalah penurunan progresif dari fungsi ginjal dalam periode beberapa bulan hingga menahun. PGK dapat disebabkan karena adanya obstruksi ureter dan ditandai dengan fibrosis interstisial. Vitamin D memiliki efek renoprotektif dengan menghambat proses fibrosis.
Tujuan: Mengkaji pengaruh pemberian calcitriol dalam mengurangi cedera epitel tubulus dan ekspresi TLR4.
Metode: Sampel dibagi dalam 3 kelompok, yaitu kelompok kontrol dengan operasi Sham (SO), kelompok obstruksi ureter unilateral (UUO), dan kelompok obstruksi ureter unilateral dengan pemberian calcitriol selama 14 hari (UUOD). Tiap kelompok terdiri atas lima ekor mencit Swiss Webster jantan. Perhitungan skor cedera tubulus dari slide Paraffin dengan pengecatan *Periodic Acid Schiff* (PAS). Pengukuran ekspresi *Toll-like Receptor 4* (TLR4) menggunakan *Reverse Transcriptase Polymerase Chain Reaction* (RT-PCR).
Hasil: Hasil penelitian ini menunjukkan perbedaan bermakna ($p<0,05$) rerata skor cedera tubulus antara kelompok SO (0,2 ± 0,05) dengan kelompok UUO (3,47 ± 0,05) dan kelompok UUOD (2,53 ± 0,19). Terdapat perbedaan bermakna ($p<0,05$) rerata ekspresi TLR4 antara kelompok SO (0,73 ± 0,13) dengan kelompok UUO (1,03 ± 0,13) dan kelompok UUOD (0,87 ± 0,07). Cedera tubulus berkorelasi secara bermakna dengan ekspresi TLR4 ($r=0,726$; $p<0,05$)
Kesimpulan: Calcitriol menurunkan cedera tubulus dan ekspresi TLR4 pada model *unilateral ureteral obstruction.* Terdapat korelasi positif antara cedera tubulus dengan ekspresi TLR4.
Kata Kunci: penyakit ginjal kronis, vitamin D, cedera tubulus, Toll-like receptor 4, obstruksi ureter unilateral

ABSTRACT

Effect of Calcitriol on Tubular Injury and Toll-Like Receptor 4 (TLR4) Expression in Mice Kidney with Unilateral Ureteral Obstruction

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Background: Chronic kidney disease (CKD) is a progressive decline in renal function over a period of several months to years. CKD can be caused by obstruction in the ureter and characterized by interstitial fibrosis. Vitamin D has several renoprotective effects that may reduce renal injury in chronic kidney disease by inhibiting fibrosis.

Purpose: This study is aimed to analyze the effect of vitamin D in reducing tubular epithelial injury and TLR4 expression.

Method: Samples were divided into three groups: a control group with Sham operation (SO), unilateral ureteral obstruction group (UUO) and unilateral ureteral obstruction group with vitamin D for 14 days (UUOD). Each group consisted of five male Swiss Webster mice. Tubular injury score calculation were performed in the paraffin slide with Periodic Acid Schiff (PAS) staining. Examination of Toll-like Receptor 4 (TLR4) expression were performed using Reverse Transcriptase Polymerase Chain Reaction (RT-PCR).

Result: The results showed a significant difference ($p < 0.05$) between the tubular injury score in SO group (0.2 ± 0.05) with UUO group (3.47 ± 0.05) and UUOD group (2.53 ± 0.19). There is a significant difference ($p < 0.05$) between the TLR4 expression in SO group (0.73 ± 0.13) with UUO group (1.03 ± 0.13) and UUOD group (0.87 ± 0.07). Tubular injury was significantly correlated with TLR4 expression ($r = 0.726$; $p < 0.05$)

Conclusion: Vitamin D reduce the tubular injury and TLR4 expression in unilateral ureteral obstruction model. There is a positive correlation between the tubular injury and TLR4.

Keywords: chronic kidney disease, vitamin D, tubular injury, Toll-like receptor 4, unilateral ureteral obstruction