

## INTISARI

### **PENGARUH VITAMIN D TERHADAP EKSPRESI mRNA CD68 DAN KOLAGEN PADA TIKUS *SPRAGUE-DAWLEY* DENGAN NEFREKTOMI 5/6 SUBTOTAL**

**Latar Belakang:** Penyakit ginjal kronis (PGK) menyebabkan terjadinya fibrosis yang ditandai dengan akumulasi kolagen dan aktivasi inflamasi dengan infiltrasi makrofag. Vitamin D telah diketahui memiliki efek renoprotektif, yang diyakini bekerja melalui inhibisi jalur NF- $\kappa$ B dalam mengurangi progresi PGK. Akan tetapi, pengaruh vitamin D terhadap ekspresi mRNA CD68 dan mRNA kolagen dalam proses inflamasi PGK belum banyak diketahui.

**Tujuan:** Mengkaji pengaruh pemberian vitamin D terhadap ekspresi mRNA *Cluster of Differentiation 68* (CD68) dan kolagen pada tikus *Sprague-Dawley* dengan nefrektomi 5/6 subtotal.

**Metode:** Model PGK dilakukan pada tikus jantan galur *Sprague-Dawley* (n=24, usia 2-3 bulan, berat 200-300 g) menggunakan prosedur nefrektomi 5/6 subtotal (grup SN, n=6). Vitamin D diberikan dengan injeksi i.p. Calcitriol 0,01 ug/100gBB/hari (SND1) dan Calcitriol 0,05 ug/100gBB/hari (SND2). Prosedur operasi sham (SO) digunakan sebagai kontrol. Pada hari ke-14 setelah operasi ginjal, tikus diterminasi dan dilakukan pengambilan ginjal. RNA diekstraksi kemudian ekspresi mRNA CD68 dan mRNA kolagen dikuantifikasi menggunakan RT-PCR. Pengecatan imunohistokimia CD68 dilakukan untuk mengamati infiltrasi makrofag.

**Hasil:** Kuantifikasi RT-PCR menunjukkan ekspresi mRNA CD68 dan kolagen yang lebih tinggi pada kelompok SN dibandingkan SO ( $p < 0,05$ ). Sementara itu, SND1 dan SND2 menunjukkan ekspresi mRNA CD68 dan kolagen yang lebih rendah dari daripada SN ( $p < 0,05$ ).

**Kesimpulan:** Vitamin D memiliki potensi dalam mengurangi proses inflamasi dan fibrosis pada penyakit ginjal kronis.

**Kata Kunci:** PGK, vitamin D, inflamasi, CD68, kolagen, fibrosis

## ABSTRACT

### THE EFFECT OF VITAMIN D ON CD68 AND COLLAGEN mRNA EXPRESSION IN SPRAGUE-DAWLEY RAT WITH SUBTOTAL 5/6 NEPHRECTOMY

**Background:** Chronic Kidney Disease (CKD) leads to fibrosis which is characterized by the accumulation of collagen and activation of inflammation with macrophage infiltration. Vitamin D has been known to have a renoprotective effect, which is associated with inhibition of the NF- $\kappa$ B pathway in reducing CKD progression. However, its effect to CD68 and collagen mRNA expression in inflammatory process of CKD has yet to be known.

**Aim:** Elucidate the effect of vitamin D administration on the mRNA expression of *Cluster of Differentiation 68* (CD68) and collagen in Sprague-Dawley rat with subtotal 5/6 nephrectomy.

**Method:** CKD model was performed in male Sprague-Dawley rats (n=24, ages 2-3 months, weight 200-300 g) using 5/6 subtotal nephrectomy procedur (SN group, n=6). Vitamin D was given with i.p. injection of Calcitriol 0.01 ug/100gBB/day (SND1) and Calcitriol 0.05 ug/100gBB/day (SND2). Sham operation (SO) procedure was used for control. Rats were terminated in day 14 after operation and kidneys were harvested. RNA was extracted then CD68 and collagen mRNA expression were quantified using RT-PCR. Immunohistochemical staning of CD68 was performed to observe the macrophage infiltration.

**Result:** RT-PCR quantification revealed higher expression of CD68 and collagen mRNA in SN compared to SO (p <0.05). Meanwhile, SND1 and SND2 demonstrated lower expression of CD68 and collagen mRNA than SN (p <0.05).

**Conclusion:** Vitamin D has the potential to reduce the inflammatory dan fibrotic process in chronic kidney disease.

**Keyword:** PGK, vitamin D, inflammation, CD68, collagen, fibrosis