

INTISARI

Korelasi antara Ekspresi Monocyte Chemoattractant Protein-1 dengan Cedera Tubulus pada Mencit dengan 5/6 Nefrektomi Subtotal

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Latar Belakang: Prevalensi dan angka kejadian gagal ginjal kronis semakin meningkat seiring dengan penuaan usia terutama di negara berkembang seperti Indonesia. Kerusakan pada tubulointerstitium memegang peranan penting dalam progresi penyakit ini, dan keterlibatan sel-sel inflamasi dapat menyebabkan patologi lebih lanjut. Monocyte Chemoattractant Protein-1 (MCP-1) diperkirakan berperan dalam merekrut sel-sel inflamasi dan meningkatkan progresi kerusakan, meskipun korelasinya dengan cedera tubulointerstisial belum diketahui dengan jelas.

Tujuan: Mengetahui peranan dan korelasi MCP-1 dengan cedera tubulus sebagai penanda penurunan fungsi ginjal pada mencit model gagal ginjal kronis.

Metode: Dilakukan 5/6 nefrektomi subtotal (SN) pada mencit galur Swiss untuk menginduksi GJK. Sham Operation (SO, n=5) tidak dilakukan 5/6 SN sebagai kontrol. Mencit diterminasi pada hari ke-7 (SN7, n=5) dan hari ke-28 (SN28, n=4) setelah operasi. Dilakukan pengukuran serum kreatinin untuk mengetahui fungsi ginjal. Skor cedera tubulus dihitung pada sediaan parafin dan pewarnaan Periodic Acid Schiff (PAS). Pemeriksaan ekspresi MCP-1 dilakukan dengan ekstraksi RNA, pembuatan cDNA, dan Reverse Transcriptase PCR (RT-PCR).

Hasil: Didapatkan peningkatan kreatinin serum dan cedera tubulus secara signifikan dari SO, SN7, dan SN28 ($P < 0,05$). Analisis dari RT-PCR menunjukkan peningkatan ekspresi MCP-1 pada 1N ($p < 0,05$ vs SO) dan penurunan ekspresi MCP-1 pada SN28 ($p > 0,05$ vs SN7). Didapatkan pula korelasi positif signifikan pada ekspresi MCP-1 dengan cedera tubulus ($r: 0,646$; $p < 0,05$).

Kesimpulan: Peningkatan MCP-1 pada fase akut memiliki peran dalam memicu progresivitas cedera tubular yang terdapat pada gagal ginjal kronis.

Kata kunci: gagal ginjal kronis, Monocyte Chemoattractant Protein-1, nefrektomi subtotal, cedera tubulus

ABSTRACT

Correlation between Monocyte Chemoattractant Protein-1 Expression with Tubular Injury in Mice with 5/6 Subtotal Nephrectomy

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BACKGROUND: The Chronic Kidney Disease (CKD) prevalence and incidence is increasing because of aging of the population especially in developing country such as Indonesia. The tubulointerstitial injury play a key role in progression of this disease, and the involvement of inflammation cells cause more severe pathology. Monocyte Chemoattractant Protein-1 (MCP-1) main property is to recruit inflammatory cells which will increase the progression of injury; although its correlation with tubulointerstitial injury has not been understood clearly.

OBJECTIVE: The aim of this study is to know the role and the correlation of MCP-1 and tubular injury as a marker of renal function attenuation in 5/6 Subtotal Nephrectomy as a CKD model in mice.

METHOD: We performed 5/6 Subtotal Nephrectomy (SN) in male Swiss Background mice to induce CKD. Sham operation (SO, n=5) procedure without nephrectomy was performed on mice as control. The mice were sacrificed in day 7 (SN7, n=5) and day 28 (SN28, n=4) after operation. We measured creatinine serum to assess renal function. Tubular injury score was quantified based on Periodic Acid Schiff (PAS) staining from paraffin slide. We performed RNA extraction, cDNA making and Reverse Transcriptase PCR (RT-PCR) to examine the expression of MCP-1.

RESULT: Significant increase of serum creatinine and tubular injury from SO, SN7, and SN28 were observed ($p < 0.05$). Densitometry analysis of RT-PCR revealed up regulation of MCP-1 expression in SN7 and SN28 ($p < 0.05$ vs SO) and down regulation of MCP-1 in SN28 with $p > 0.05$ vs SN7. We found significant parallel correlation between MCP-1 and tubular injury expression ($r: 0.646$; $p < 0.05$).

CONCLUSION: The up regulation of MCP-1 in acute phase triggers the progressivity of tubular injury in chronic kidney disease.

KEYWORDS: chronic kidney disease, MCP-1, subtotal nephrectomy, tubular injury