

Intisari

KORELASI RASIO NEUTROFIL LIMFOSIT DAN *HIGH SENSITIVE C-REACTIVE PROTEIN* TERHADAP PERUBAHAN KADAR HEMOGLOBIN PADA PASIEN PENYAKIT GINJAL TAHAP AKHIR DENGAN HEMODIALISIS RUTIN YANG MENDAPAT ERITROPOIETIN α

Latar Belakang : 80-90% PGTA mengalami anemia dengan penyebab utama defisiensi eritropoietin sehingga pemberian *ESA* menjadi terapi utama. Inflamasi kronis PGK berperan terjadinya anemia. RNL sebagai marka inflamasi yang murah dan sederhana perlu diuji.

Tujuan : Mengetahui korelasi nilai RNL terhadap *hs-CRP* dan perbandingannya untuk mengetahui tingkat inflamasi dan mengetahui korelasi RNL terhadap perubahan kadar Hb pada pasien PGTA dalam terapi hemodialisis yang diberikan terapi eritropoietin α .

Metode : Desain kohort prospektif 3 bulan pasien PGTA HD anemia dalam terapi eritropoietin α di Unit HD RSUP Dr. Sardjito. Uji *Chi-Square* atau *Fisher exact test* untuk uji beda proporsi, uji *Spearman* dan *Mann Whitney* untuk menguji korelasi RNL, *hs-CRP* dan perubahan kadar Hb. Uji bivariat perubahan Hb digunakan analisis *Fisher exact test*, *independent T test*, dan *Mann Whitney* dilanjutkan analisis multivariat regresi linier.

Hasil : Jumlah subyek 48, laki-laki 23(47,9%), perempuan 25(52,1%), rerata usia 52,57 tahun, IMT 24,06 kg/m², lama HD 80,6 bulan, Kt/V 1,71, *hs-CRP* <5mg/L 35(72,9%), Hb 9,26 g/dl, feritin 446,35 ng/mL, albumin 4,07g/dL dan BUN 56,18mg/dL. Kelompok *hs-CRP* <5mg/L: 35(72,9%); *hs-CRP* $\geq$ 5mg/L: 13(27,1%), RNL <3,5: 9(81,3%) dan RNL $\geq$ 3: 9 (18,8%). Terdapat korelasi negatif bermakna *hs-CRP* dengan perubahan Hb ($r=-0,394$, $p=0,006^*$), korelasi negatif bermakna RNL dengan perubahan Hb ($r=-0,294$, $p=0,043^*$) dan korelasi positif tidak bermakna perubahan RNL dengan perubahan *hs-CRP* ($r=0,122$, $p=0,409$). Faktor prediktor perubahan Hb yaitu *hs-CRP*, RNL, albumin, dan feritin (masing-masing $p=0,002; 0,048; 0,042; 0,039$). Kelompok *hs-CRP* normal mempunyai risiko 7,84 kali lipat untuk mengalami peningkatan hemoglobin dibanding kelompok *hs-CRP* tinggi.

Simpulan: Terdapat korelasi negatif yang signifikan antara RNL dan *hs-CRP* terhadap perubahan kadar hemoglobin pada pasien PGTA-hemodialisis yang diberikan eritropoietin α .

Kata kunci : rasio neutrofil limfosit, *hs-CRP*, hemoglobin, hemodialisis, eritropoietin alfa, PGTA

Abstract

The Correlation of Neutrophil to Lymphocytes Ratio and High Sensitivity C-Reactive Protein towards Hemoglobin Levels Changes in End Stage Renal Disease with Regular Hemodialysis Patients Receiving Erythropoietin α

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Background: The leading cause of anemia in 80-90% of ESRD patients is erythropoietin deficiency, making ESA the primary treatment. Chronic inflammation caused by chronic kidney disease (CKD) contributes to the development of anemia by limiting erythropoiesis. The correlation between RNL, a cheap and direct inflammatory biomarker, and hs-CRP (an accurate inflammatory biomarker) and Hb level changes in anemic CKD-regular hemodialysis patients receiving erythropoietin alpha therapy.

Objective: To evaluate the correlation of RNL and hs-CRP and its comparison to determine the level of inflammation, and the correlation between RNL and changes in Hb levels in hemodialysis-treated ESRD patients receiving erythropoietin alpha therapy.

Methods: This study was a 3-month prospective cohort study. Spearman correlation test was used to examine the correlations between RNL and Hb changes, RNL and hs-CRP, and hs-CRP and Hb changes. Fisher exact test, independent T-test, and Mann Whitney were used to examine the predictor for changes in Hb, followed by a linear regression multivariate analysis.

Results: The total number of participants was 48, consisting of 23(47.9%) males and 25 (52.1%) females. The mean age was 52.57 years. Mean BMI and HD duration were 24.06 kg/m² and 80.6 months. The mean value of Kt/V was 1.71. Mean hs-CRP level of <5mg/L was 35(72.9%) while hs-CRP level of >5 mg/L was 13(27.1%). Nine patients had RNL $\geq 3,5$ (18.8%). The mean Hb was 9.26 g/dl, ferritin 446,35 ng/mL, albumin of 4.07 g/dL, BUN of 56.18 mg/dL. There were significant negative correlations between hs-CRP and Hb changes ($r=-0.394$, $p=0.006$) and between RNL and Hb changes ($r=-0.294$, $p=0.043^*$). An insignificant positive correlation was found between RNL and hs-CRP ($r=0.122$, $p=0.409$). The changes in Hb predictors were hs-CRP, RNL, albumin, and ferritin ($p=0.002$; 0.048; 0.042; 0.039, respectively). The normal hs-CRP group had a 7.84-fold risk of having an increase in hemoglobin compared to the high hs-CRP group.

Conclusion: This study found a significant inversed correlation between RNL and hs-CRP on changes in hemoglobin levels in PGTA-hemodialysis patients given erythropoietin alpha.

Keywords: Neutrophil lymphocyte ratio, hs-CRP, hemoglobin, hemodialysis, erythropoietin alpha, ESRD