

The Effects of Clinical and Genetic Factors on Erythropoietin Resistance in Patients with Maintenance Hemodialysis

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Background : Erythropoietin (EPO) requirement may be influenced by numerous clinical conditions, such as blood loss, iron deficiency, infection and inflammation or secondary hyperparathyroidism. Besides these well characterized factors, Interleukin-1 (IL-1) have been reported to inhibit the synthesis of EPO in vitro. Angiotensin II had some stimulating effects on hematopoietic progenitors expansion in vitro in the presence of other cytokines. The objective of our study was to assess the influence of Interleukin-1 β , angiotensin converting enzyme (ACE) gene polymorphisms and other clinical factors on erythropoietin requirements in maintenance hemodialysis patients.

Methods : 104 (M:F=49:55, Age:54.48 \pm 1.31) patients with ESRD undergoing maintenance hemodialysis were included in this study. They were divided into two groups by Interleukin-1 β (-511 CC vs non CC), ACE (DD vs non DD) gene polymorphisms, respectively. We compared age, gender, cause of renal failure, duration of hemodialysis, use of angiotensin-converting enzyme inhibitor, hemoglobin, serum iron, TIBC, transferrin saturation, ferritin, albumin, iPTH, hs CRP, Kt/V and erythropoietin resistance index (ERI: weekly EPO dose/Hct/kg) between two groups, respectively. We also have assessed independent association of ERI with clinical and laboratory parameters using linear regression analysis.

Results : In the linear regression analysis, age (p=0.011), ferritin (p=0.0005), hs CRP (p=0.003), dose of dialysis (p=0.025) were determined to be independent factors affecting ERI. But, there was no significant difference in ERI in the -511 CC group (n=18, 3.76 \pm 1.85) compared to non CC group (n=83, 4.36 \pm 2.44) in IL-1 β gene polymorphism. Also, there was no significant difference in ERI in the DD group (n=75, 4.26 \pm 2.51) compared to non DD group (n=26, 4.23 \pm 2.51) in ACE gene polymorphism.

Conclusion : Clinical factors such as age, ferritin, hs CRP, dose of dialysis were predictive factor of ERI. But, Interleukin-1 β , ACE gene polymorphism seems not to be determining factor of EPO resistance in patients on maintenance hemodialysis.