



Effect of Recombinant Human Erythropoietin on Nitric Oxide , Endothelin - 1 and Angiotension - II in Chronic Hemodialysis Patients

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Objectives:

To investigate the effect of recombinant Human erythropoietin (rhuEpo) on Nitric Oxide(NO) , Endothelin - 1 (ET - 1) and Angiotension - II (Ang II) in chronic hemodialysis patients.

Methods:

Eighty patients on chronic hemodialysis were enrolled in this randomized , controlled study. Forty - three received rhuEpo (HDepo $n = 43$) and thirty - seven did not (HD $n = 37$) . According to the blood pressure , each group was sub - divided into two groups , HDepo with hypertention (HDepo - 1 group $n = 23$) , HDepo with normal blood pressure (HDepo - 2 group $n = 20$) , HD with hypertention (HD - 1 group $n = 19$) , HD with normal blood pressure (HD - 2 group $n = 18$) . Twenty uremia patients who did not receive hemodialysis therapy and twenty normal adults were chosen as control group . The NO level was measured by colorimetry. The ET - 1 level and the Ang II level were measured by radioimmunoassay (RIA) .

group	n	NO ($\mu\text{mol/L}$)		ET-1 (pg/ml)	
		Before	After	Before	After
HDepo	43	146.63+67.20	99.99+51.99**	259.78+115.4	334.31+115.01*
HD	37	135.54+60.94	142.28+63.17 [^]	211.60+95.07	246.93+112.79 [^]
NC	34	74.32+17.58		45.12+8.74	

*Comparing before and after in using Epo; * $P < 0.05$; ** $P < 0.001$;

[^]comparison among groups; [^] $P < 0.05$

Three months after using Epo serum NO and ET - 1 hypertension

Group	n	NO($\mu\text{mol/L}$)	ET-1 (pg/ml)
Normal control	34	74.32+17.58	45.12+8.74
Essential hypertension	20	54.36+34.72*	170.87+90.86**
HDepo Group	43	99.99+51.99	334.31+115.01
HDepo-1	23	85.04+47.80 [^]	376.58+93.43 [^] [^]
HDepo-2	20	117.19+52.40 [^]	281.57+105.75 [^]
HD Group	37	142.28+63.17	246.93+112.79
HD-1	19	121.29+50.61*	288.92+107.03*
HD-2	18	164.45+68.75	199.45+91.51

*Compared with normal control group with essential hypertension (eh)

* $P < 0.05$ ** $P < 0.001$; [^]HDepo-1 and HDepo-2 compare [^] $P < 0.05$ [^]HDepo-1 and HD-1 compare; [^] $P < 0.05$; *HD-1 and HD-2 compare * $P < 0.05$; [^]HDepo-2 and HD-2 compare; [^] $P < 0.05$

Results:

- 1.The NO level , ET - 1 level , Ang II level in uremia patients receiving HD therapy were higher than those in normal control group($P < 0.001$) . The NO level in serum of hemodialysis patients was higher than that in patients did not receive hemodialysis therapy. The ET - 1 level and Ang II level were higher than those in patients did not receive hemodialysis therapy ($P < 0.05$) .
- 2.After three months' therapy , the NO consistency in serum in HD group declined after the rHuepo therapy , it was lower than that of normal control group. While the ET - 1 consistency and Ang II concentration raised($P < 0.05$) .
3. After the therapy , diastolic pressure , systolic pressure , mean arterial pressure of HDepo group were all higher than those of HD group($P < 0.001$) . The increase in blood pressure correlated with the decline of the NO concentration as well as increase in ET - 1 and Ang II concentration.

Conclusions:

Erythropoietin can reduce serum NO concentration in chronic hemodialysis patients. It also can raise ET - 1 and Ang II concentration. Hypertention caused by rHuepo was associated with decrease in NO and increase in ET - 1 and Ang II concentration.

References:

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