Low-Dose Human Erythropoietin in Chronic Hemodialysis Patients

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Dear Sir,

Table 1. Effect of low-dose rHuEPO treatment in patients undergoing hemodialysis (mean $\pm$ SD, n = 14)

Recombinant human erythropoietin (rHuEPO) has been shown to be effective in correcting renal anemia of uremic patients [1–4]. In the literature, the initial endovenous dose to raise the hematocrit to a target level 30% higher varies from 40 U/kg body weight to above [1–4]. Four patients treated with 15 U/kg body weight had a partial response, but enough to eliminate transfusion requirements [5]. Elevation of blood pressure and hypertensive encephalopathy are the more frequent severe complications [1–4]. A slower rise in hematocrit at the lower dose provided more time to intervene with appropriate medication in order to prevent hypertensive encephalopathy [6].

In order to minimize complications, we studied the effect of low-dose rHuEPO in renal anemia. Fourteen patients were included in this study, 6 males and 8 females, with an average age of 58.4 ± 16.5 years, who had been on hemodialysis for an average of 66.9 ± 42.3 months. All patients presented moderate to severe anemia whose transfusional requirements were 6.29 ± 2.08 concentrates/patient/year. They were treated with rHuEPO (Cilag, Schaffhausen, Switzerland) endovenously, three times a week, for 4 months with a constant dose of 13.61 ± 1.71 U/kg body weight (range 10.5–16.3 U/kg).

All patients responded to the treatment. It was enough to slowly increase hematocrit and hemoglobin (table 1) and eliminate transfusion requirements. After 4 months, 7 patients had good responses (hematocrit > 30%) and 7 had partial responses (hematocrit 25–30%). Treatment was well tolerated without severe side effects. No hyper-

Basal After After After

1 month 2 months 4 months

Hb, g/dl 7.46 ± 0.59 $8.69 \pm 1.03^{**}$ $8.93 \pm 0.7^{**}$ $9.81 \pm 0.8^{**}$ Ht, % 23.40 ± 2.00 $25.94 \pm 2.70^{*}$ $27.89 \pm 2.4^{**}$ $29.81 \pm 2.3^{**}$

Hb = Hemoglobin; Ht = hematocrit. *p < 0.01; **p < 0.001 vs. data before rHuEPO treatment, analyzed by Student's t test (paired t test).

tension, seizures nor thrombosis was observed. Increased antihypertensive medication was not necessary.

In summary, these results suggest that endovenous low-dose rHuEPO could be an effective and safe alternative treatment for renal anemia in hemodialysis patients, because they are clinically well without needing transfusion despite, in some patients, hematocrit levels < 30%.

References

Eschbach JW, Abdulhadi MH, Browne JK, et al: Recombinant human erythropoietin in anemic patients with end-stage renal disease: Results of a phase III, multicenter clinical trial. *Ann Intern Med* 1990;111:992–1000.

Bommer J, Kugel M, Schoeppe W, et al: Dose-related effects of recombinant human erythropoietin on erythropoiesis: Results of a multicenter trial in patients with end-stage renal disease; in Koch, KM (ed): *Treatment of Renal Anemia with Recombinant* 484

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Human Erythropoietin. *Contr Nephrol. Basel*, Karger, 1988, 6 vol 66, pp 85–93.

Akizawa T, Koshikawa S, Takaku F, et al: Clinical effect of recombinant human erythropoietin on anemia associated with chronic renal failure. A multi-institutional study in Japan, *Int J Artif Organs* 1988;11:343–350.

Lim VS, Degowin RL, Zavala D, et al: Recombinant human erythropoietin treatment in pre-dialysis patients. *Ann Intern Med* 1989;110:108–114.

Eschbach JW, Egrie JC, Downing MR, et al: Correction of the anemia of end-stage renal disease with recombinant human erythropoietin; Results of the phase I and II clinical trial. *N Engl J Med* 1987;316:73–78.