Resistance to Human Recombinant Erythropoietin in Hypothyroidism

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respectively (fig. 1). The target level of Hct was achieved within 6 weeks. The dose of hrEPO was reduced to 4,000 units once weekly and was administered subcutaneously. Her Hb and Hct levels have been maintained with the same regimen up till now.

These findings not only prove that underlying hypothyroidism may be a cause of resistance to hrEPO treatment but also suggest that an euthyroid state is essential for the action of erythropoietin on the bone marrow.

References

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Normochromic normocytic anemia is a common laboratory finding in hypothyroidism [1]. Several mechanisms have been implicated as the cause of anemia of the hypothyroid patient [2]. We have observed a hypothyroid hemodialysis patient with diminished response to human recombinant erythropoietin (hrEPO).

The patient is a 37-year-old female who was accepted to our hemodialysis unit in 1979. Apart from 4.5 years with a functioning renal allograft, she was treated thrice weekly with regular hemodialysis. HrEPO treatment was instituted by the beginning of 1991 as a part of her renal replacement therapy together with oral iron supplementation. At the beginning she received 4,000 units of hrEPO thrice weekly which was administered intravenously. Her hemoglobin was 7.6 g/dl and haematocrit 24.7% at the initiation of therapy. She failed to respond to this treatment within 3 months. The route of administration was switched to subcutaneous injections, and the dose regimen was again 4,000 units thrice weekly. The expected hematological response was not observed within 12 weeks. In order to define the underlying mechanism for hrEPO resistance she underwent a hematological survey which yielded the following results: Hb, 8.6 g/dl; Hct,

26%; MCV, 89.5 fL; MCH, 27.1 pg; MCHC, 30.1 g/dL; WBC, $6 \times 10^9/L$; platelets, $128 \times 10^9/L$; serum iron, 17.6

Fig. 1. Increment in Hb and Hct after the initiation of levothyroxine.

$\mu\text{mol/L}$; total iron-binding capacity, 50 $\mu\text{mol/L}$; serum vitamin B₁₂, 355.74 ng/mL; serum folate, 16.7 nmol/L. A bone marrow aspiration revealed a normocellular marrow with positive iron stores. There were no clinical or laboratory data suggesting chronic infection, malignancy or chronic liver disease. On the other hand a moderately enlarged thyroid gland with multiple nodules was palpated. Her endocrinological workup showed the following results: free triiodothyronine, 3.02 pmol/L; free thyroxine, 11 pmol/L; thyroid-stimulating hormone, 64 mIU/L. Her scan demonstrated a suppressed multinodular thyroid gland.

She was prescribed 100 mg levothyroxine per day. After 4 weeks of thyroid replacement therapy her Hb and Hct values rose to 11.4 g/dL and 34.8%,