A Case Study of Inappropriate Idiopathic Erythropoietin Production in a Patient on Regular Hemodialysis for 10 Years: Is Beetjuice a Factor?

S.		Dal	mak
E.		Erek	
S.		Apay	din
H.		Savas	
K.		Serdengeçti	
U.		Ülkü	

Nephrology Department, Cerrahpaşa Medical Faculty, İstanbul, Turkey

Serran Dalmak, MD, Cerrahpaşa Tıp Fakültesi, İç Hastalıkları Kliniği, Nefroloji Bilim Dalı, TR-34300 Aksaray/İstanbul (Turkey)

Dear Sir,

Inappropriate idiopathic erythropoietin (EPO) production has been noted by a very limited number of investigators [1] and no mechanism for this unusual clinical picture has been defined so far.

We present a 60-year-old woman who has been on regular hemodialysis for 10 years in our HD unit. Her renal insufficiency was secondary to chronic glomerulonephritis. She lives at sea level, was always a non-smoker and has been drinking beetjuice from the time she was first diagnosed as having glomerulonephritis. She had spontaneous femoral neck fracture in 1995 and amyloid was found in her shoulder (tendon) at the same time. Erythrocytosis was not found in her family. Her physical findings were normal. Although her mean PTH was 103 ng/dl (N 27), her parathyroid glands were found normal by ultrasonography. Her hematocrit was 42%, white blood count 3,000/mm³, platelets 150,000/mm³. Her red cell mass was 34.3 ml/kg using serum [⁵¹Cr]Na-Chromat (N 20-30). Her serum iron level was 98 µg/dl, iron-binding capacity 346 µm/dl and ferritin 63.1 ng/ml (N 14-150). Her EPO levels were 70-150 mIU/ml (N 1.5-21). Neither iron nor EPO treatment have been applied. Her kidneys were small (right 44 × 20 mm, left 73 × 20 mm) with increased parenchymal echogenicity and decreased thickness of renal parenchymal by

ultrasonography. Neither hereditary nor acquired renal cysts were observed. Her arterial oxygen saturation was 97.3% while pO₂ was 99.2 mm Hg, pO₃₄ was 38.3 mm Hg, and her bicarbonate level was 28.5 mmol/l with no evidence of chronic obstructive pulmonary disease. No sign of tissue hypoxia was present; therefore, high-affinity hemoglobinopathy was not suspected. Her spleen and liver were found normal with ultrasonography without any evidence of an extrarenal site of EPO production such as hepato-ma. Cerebellar hemangioblastoma was not found. No ovarian or uterine pathologic lesions were noted. No coincident polycythemia vera was proven in this patient either clinically or biochemically.

Since neither renal nor extrarenal EPO production could be proven, we believe this case to be one with inappropriate idiopathic EPO production which could be a result of stimulus on hepatic

cell lines by metals such as cobalt, nickel and manganese [2]. Hyper-parathyroidism is known to inhibit peripheral blood erythroid colony formation and increase erythrocyte osmotic fragility [3]. Since our patient had relatively mild hyperparathyroidism, she responded to high levels of intrinsic EPO with erythrocytosis. We think in this patient, beetjuice which is known to be one of the sources of cobalt, should be considered as the promoter of erythrocytosis.

References

- Shih LY, Leu ML: Erythrocytosis in patients with renal failure on hemodialysis: Study of underlying mechanism by in vitro erythroid culture assay. *Exp Hematol* 1993;21:1239-1243.
- Goldberg MA, Imagawa S, Dunning PS, Bunn HF: Oxygen sensing and erythropoietin gene regulation. *Contrib Nephrol. Basel, Karger, 1989, vol 76, pp 39-56.*
- Meytes D, Bogin E, Massry SG: Effect of parathyroid hormone on erythropoiesis. *J Clin Invest* 1981;67:1263-1269.

KAHGEI

E-Mail karger@karger.ch Fax + 41 61 306 12 34 <http://www.karger.ch>

© 1996 S. Karger AG, Basel 0028-2766/97/0751-0118\$ 12.00/0

This article is also accessible online at: <http://BioMedNet.com/karger>