Erythropoietin in the treatment of anaemia in a nephropathic pregnant woman

Case report

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Summary: Administration of subcutaneous low-dose recombinant human erythropoietin in the treatment of anaemia in a case of a nephropathic pregnant woman.

Key words: Erythropoietin; Anaemia; Nephropathic pregnant woman.

INTRODUCTION

Erythropoietin (Epo) is a glycoprotein hormone which has been shown to be the primary trophic hormone for erythropoiesis. Production of erythroid cells depends on stimulation by erythropoietin produced by the kidneys in response to hypoxia.

Although a serious renal insufficiency in pregnancy is rather rare, even small alterations in renal functioning could significantly worsen physiological anaemia in pregnant women.

Administration of recombinant human erythropoietin (rHuEpo) has successfully been used to treat anaemia in many patients with chronic renal failure. In pregnancy some cases of rHuEpo advantageous treatment are reported ([1, 2]). Possible side effects are maternal hypertension and haematological alterations in the newborn ([3]).

Animal studies have suggested that the drug may cross the placenta ([4]).

Our case study of low dose rHuEpo administration in a nephropathic pregnant woman is reported.

Received 15-2-1996 from the
Institute of Gynecology, University of Messina
Revised manuscript accepted for publication 28-5-1996.

CASE REPORT

The patient was 22 years old, in her second pregnancy.

In her first childbirth she spontaneously delivered an infant weighing 3,100 g at the 39th week.

The patient was affected by chronic glomerulo-nephritis and at the 20th week of gestation she was already seriously anaemic: Hb 6.3 g%, Hct 19.2% (Table 1). Proteinuria was also present (6 g/die). The foetus was normally developed.

At the 26th week of gestation renal functioning began to fail (serum creatinine 1.7 mg%) and ecographic examination revealed an abnor-

Table 1.

Gest. Age (weeks)	XX	XXVI	XXX	XXXII	XXXV
Eryt. (mmc)	3.020.000	2.900.000	2.150.000	2.770.000	3.140.000
Hb (g%)	6.3	6	5.3	6.4	7.2
Ht (%)	19.2	18.8	16.7	19.3	21.7
Plat. (mmc)	259.000	250.000	250.000	184.000	228.000
Creat. (mg%)	0.9	1.7	1.8	1.7	1.7
Uric. (mg%)	3.7	6	6.2	6.4	5.8
Protein. (g/die)	6	7.1	9	8.7	10
Diuresis (cc)	1.900	1.780	2.500	2.300	2.400

mal value of foetus abdominal circumference (< 2 SD).

At the 30th week the patient was admitted to our Institute because of worsening anaemia. She began treatment with rHuEpo 2,000 units twice weekly by subcutaneous injection (60/kg/week). Cardiotocography monitoring was normal. After five weeks of treatment haemoglobin (+29,9%) concentration and haematocrit (+35.8%) values were significantly increased. No adverse effect related to rHuEpo therapy was observed and the patient's blood pressure remained normal.

At the 35th week of gestation the patient spontaneously delivered an infant weighing 1,950 g with Apgar score at $5' > 7$. The newborn's haematocrit values (69% and 45%, respectively, at the first and the third day after delivery) were in the normal range.

DISCUSSION

Some studies have shown the great importance of endogenous erythropoietin in pregnancy anaemia ([5, 6, 7]). In all these studies Epo concentrations were significantly higher in pregnant women with iron deficiency anaemia than in healthy pregnant women. Moreover, Milman *et al.* reported that Epo concentrations after iron supplementation were significantly lower in the treated group than in the placebo group ([7]).

In a large review, Huch *et al.* supported the hypothesis that stimulation of hematopoiesis in pregnancy takes place separately in the two circulations ([8]). Erythropoietin appears to be the main regulator in both mother and foetus. Human placenta is like a barrier to endogenous and recombinant erythropoietin and thus fulfils the cardinal precondition for the use of rHu Epo in the treatment of maternal pregnancy anaemia.

In our case study rHuEpo therapy was effective in the treatment of anaemia in a nephropathic pregnant woman, whose physiological increase of plasmatic erythropoietin occurring in the second part of pregnancy had been blocked by the damaged kidney.

Administration of subcutaneous low doses of rHuEpo was without complications in either mother or infant. The normal value of newborn haematocrit shows that administration of low doses of rHuEpo is not harmful to the foetus. This is in agreement with those Authors who do not belive the drug may cross the placenta ([1, 8]).

In conclusion, it is well-established that erythropoietin, whose plasmatic concentration increases steadily throughout pregnancy ([9]), especially in the second and third trimester, is the most important erythropoiesis stimulator in anaemic pregnant women.

In anaemic nephropathic pregnancies rHuEpo administration has been successful in our case study, as in others, without maternal and foetal complications ([1, 2]).

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