CPC-081

Management of a severe anemia with recombinant human erythropoietin in a Jehovah's Witness patient: Case report and review of literature

J. Giraud[1], J. Jezequel[1], K. Abdel Aal[2], V. Duperrin[1], R. Geha[2], A. Fabreguettes[1]
Pharmacy[1] and cardiology[2] department, Centre Hospitalier Robert Ballanger, Aulnay sous Bois, 93602, France

Introduction

Jehovah's Witness accept most available medical treatments, but not blood transfusions due to their religion's interpretation of several passages from the Bible. The medical care of these patients becomes problematic in cases of severe life-threatening anemia. **Recombinant human erythropoietin** (rHuEPO), a biosynthetic hormone that regulates red blood cell (RBC) production, is available commercially as epoetin alfa, epoetin beta, and darbepoetin alfa.

Objective

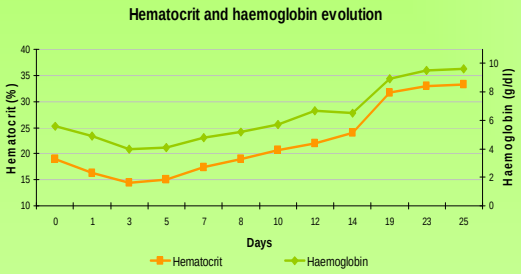
Describe the case of a patient with severe anemia who received erythropoietin therapy based on a review of literature.

Methods

We performed a literature search of the medline with key words: anemia, Jehovah's witness, erythropoietin

Case report

A 77-year old woman sent to the emergency department with thoraco-epigastric pain, blood clots and vomiting since a week. Cardiac examination revealed a coronary syndrome caused by an anemia at 5.6g/dl (hematocrit=Ht=18.9%), gastrointestinal induced. On day 3 haemoglobin(Hb) fell to 4g/dl (Ht=14.4%) then a treatment with rHuEPO beta in 30000UI per week (380UI/kg/week) associated with high intravenous iron supplementation (300mg/48h) was instituted. After 16 days of treatment Hb (8.9g/dl) and Ht (31.6%) have doubled and clinical improvement has been observed. Patient was discharged on day 22 of treatment with a total of 4 rHuEPO injections (Hb=9.6g/dl).



Autors	Years	Age/Sexe	Indication	Ht or Hb when Epo starting	Time to twice	Epo and dose	Other Drugs
Gilcreast DM. and al	2001	51/F	Trauma	Ht=12%	Ht=35% d30	rHuEPO IV 20,000ui/d until 7,000ui/8h	Iron IV
Walton T. and al	2002	50/F	Intestinal Hemorrhage	Ht=10.4%	Ht=38.5% d28	rHuEPO IV 130-260ui/kg 3times/weeks	
Cothren C. and al	2002	44/F	Trauma	Hb=3.2	Hb=6 d6	rHuEPO 600ui/kg/d 48h 300ui/kg/d 72h	Blood substitue (HBOC)
Gannon CJ. and al	2002	50/M	Intestinal Hemorrhage	Hb=3.5	Hb=6 d23	rHuEPO SC 250ui/kg/d 48h then 500ui/kg/d	HBOC iron PO
Kulvatunyou N. and al	2004	67/M	Trauma	Hb=3.0	Hb=6 d26	rHuEPO IV 48,000ui/d 19d and then 6 injections/20d	iron, folate, vit K and B12
Hashem B. and Dillard TA.	2004	44/F	Vaginal Hemorrhage	Hb=2.5	Hb=5.5 d10	rHuEPO IV 60,000ui/1d then 40,000ui/d 3d followed by 40,000ui every other day for 1week	iron folic acid
Schalte G. and al	2005	44/F	Vaginal Hemorrhage post operative	Hb=2.3	Hb=6.5 d24	rHuEPO IV 600UI/kg/d alternate day (6doses in 13d) then 10,000ui/d SC twice weekly	iron folic acid vitamin
Charles A. and al	2006	72/F	Maxilofacial surgery	Ht=25.1% d1 Ht=17.1% d3	Ht=30% d20	rHuEPO SC 20,000ui/d d1-2 40,000ui/d d3-10 20,000ui/week until d22	iron IV then PO
Belfort M. and al	2010	28/F	Pregnancy postop	Ht=7.8%	Ht=20.8% d10	rHuEPO IV 600ui/kg/d 10d	iron
Raman SR. and al	2011	60/F	Intestinal Hemorrhage	Hb=3.3	Hb=7.6 d30	rHuEPO 10,000ui/d on alternate day	iron IV
Gutierrez G. and al	2011	44/F	Vaginal Hemorrhage	Hb=3.5	Hb=6.7 d13	darbepoetin alfa IV 200µg/week	iron IV, vitK, multivitamin

Autors	Year	Clinical trial	Study design	Conclusion
van Ipereb CE. and al	2000	36 patients Hb<11,2g/dl	Folate IV daily or folate and iron IV daily or folate and iron IV daily and epoetin alfa 300ui/kg/d on alternate day during 10 days on 14	with epoetin alfa significant rise of reticulocyte (maximum d13) bone marrow of critically ill patients is able to respond to exogenous EPO
Corwin HL. and al	2002	1302 patients Ht<38%	Placebo or rHuEPO SC 40,000ui/week 3 weeks	rHuEPO reduces of RBC transfusion increases in haemoglobin level
Georgopoulos D. and al	2005	148 patients Hb<12g/dl	Placebo or rHuEPO SC 40,000ui/week or 40,000ui 3times/week treated betwenn 2-3 weeks	rHuEPO reduce the need of RBC transfusion but no difference between the two dosing schedules
Corwin HL. and al	2007	1460 patients medical, surgical or traum	Epoetin alpha/placebo 40,000ui/weeks 3weeks	no decrease of incidence of RBC transfusion reduce mortality in trauma increase incidence of thrombotic events

Discussion

Currently in emergency there is no alternative to transfusion and a higher mortality is linked to a low haemoglobin level. Several strategies can be utilized to treat the Jehovah's Witness patient: intraoperative blood salvage, minimizing metabolic demand, maximizing oxygen delivery, reducing iatrogenic blood loss and increasing RBC production.
Some clinical trials have shown the efficacy of rHuEPO, used in off-label, administered once weekly or alternative day, to reduce mortality and sometimes RBC transfusions but always to increase haemoglobin level. Support with amino acids, vitamin B12, folate and particularly iron accelerates the correction of anemia when they are associated with rHuEPO.
Eleven recent publications reported experiences with rHuEPO intravenous(IV) or subcutaneous(SC) administration in anemia therapy. The optimal dose of rHuEPO remains unclear: dosage ranges from 200µg/week darbepoetin alfa, to 130UI/kg of rHuEPO three times weekly, until 600UI/kg/day for 2 days then 300UI/kg/day. After starting treatment the haemoglobin level doubled in 19 days (in an average of 4 days to 30 days).

Conclusion

Our weekly rHuEPO protocol is in the lower targets found in the literature but it appears as effective as other protocols. An important variability without major efficacy difference appears about rHuEPO used for Jehovah's Witness patients. Few patients can survive with a haemoglobin level of less than 5g/dl without transfusion. rHuEPO may provide an alternative therapy in life-threatening anemia, when blood transfusion is not accepted by the patient.

18th Congress of the EAHP, 13-15 March 2013, Paris, France