Epoetin Alfa

A Review of its Pharmacodynamic and Pharmacokinetic Properties and Therapeutic Use in Nonrenal Applications

Anthony Markham and Harriet M. Bryson

Adis International Limited, Auckland, New Zealand

Various sections of the manuscript reviewed by:

W.M. Bennett, Department of Medicine, Division of Nephrology, Hypertension and Clinical Pharmacology, Oregon Health Sciences University, Portland, Oregon, USA; S. Cascinu, Oncologia Medica, University of Ancona, Ancona, Italy; M.A. Fischl, Department of Medicine, Division of General Medicine, University of Miami School of Medicine, Miami, Florida, USA; D.S. Halperin, Département de Pédiatrie, Hôpital Cantonal Universitaire de Genève, Geneva, Switzerland; J. Hayashi, Second Department of Surgery, Niigata University School of Medicine, Niigata, Japan; R.G. Kendall, Department of Haematology, The General Infirmary at Leeds, Leeds, England; K.M.L. Leunissen, Academisch Ziekenhuis Maastricht, Maastricht, The Netherlands; H. Ludwig, Department of Medicine and Oncology, Wilhelminenspital der Stadt Wien, Vienna, Austria; M. Mittelman, Department of Medicine B, Hasharon Hospital, Petah-Tikva, Israel; J.J. Walshe, Nephro-Urology Division, Beaumont Hospital, Dublin, Ireland

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Epoetin alfa is a recombinant form of the principal hormone responsible for erythrogenesis, erythropoietin. Already an established treatment for anaemia associated with renal failure, epoetin alfa may also be used to correct anaemia in other patient groups. The drug increases the capacity for autologous blood donation in patients scheduled to undergo surgery and attenuates the decrease in haematocrit often seen in untreated autologous donors. However, transfusion requirements did not significantly decrease in many trials. Epoetin alfa also accelerates red blood cell recovery after allogeneic – but not autologous – bone marrow transplant. Limited data in patients with adult rheumatoid arthritis suggest that while epoetin alfa increases haematocrit/haemoglobin levels, overall clinical rheumatological status may not improve. However, the drug did improve quality of life in a small cohort of children with juvenile rheumatoid arthritis in addition to correcting anaemia.

Response rates to treatment with epoetin alfa in patients with anaemia associated with cancer range between 32 and 85%. Anaemia associated with cancer chemotherapy also responds well to treatment with the drug as does anaemia associated with zidovudine therapy in patients with acquired immune deficiency syndrome (AIDS).

Studies evaluating the use of epoetin alfa as treatment for anaemia of prematurity have used different methodologies and dosages, making overall analysis difficult. Nevertheless, it appears that high dosages are necessary for response. Results from 1 study suggest that treatment with epoetin alfa appears to be more costly than transfusional support in this application; the relevance of this finding is questionable, however, given that the aim of treatment with epoetin alfa is elimination of transfusion requirements.

The incidence of many adverse events associated with epoetin alfa treatment in patients with renal failure (hypertension, seizures and thromboembolic events) has been minimal in patients without renal failure. Adverse events occurred at a similar rate in placebo and epoetin alfa recipients in placebo-controlled trials evaluating the use of the drug as treatment for anaemia in patients with cancer receiving chemotherapy or patients with AIDS receiving zidovudine.

In summary, epoetin alfa is an effective alternative to blood transfusion, reducing anaemia and producing consequent improvements in quality of life in many nonrenal applications. It was more effective than placebo in a number of double-blind trials and may be particularly useful as treatment for anaemia associated with other drugs such as cisplatin and zidovudine.

Epoetin alfa increases reticulocyte counts in healthy individuals and patients with anaemia associated with various pathologies including myelodysplastic syndrome and rheumatoid arthritis. Examination of the myeloid/erythroid ratio in 7 patients with myelodysplastic syndrome receiving epoetin alfa revealed an increased ability to form colony forming unit-erythroid derived colonies in 3 of 4 patients with increased reticulocyte counts.

This increase in reticulocyte count is followed by rises in haematocrit and