Effect of Erythropoietin Therapy on Cardiorenal Syndrome

Thesis

Submitted for partial fulfilment of master degree in
Medical Physiology

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(2012)

Summary

Anemia is a clinical manifestation commonly observed in patients with congestive heart failure (CHF) and renal disease**.** Prevalence of this condition is estimated to be between 15 and 55% ***(Felker et al., 2004).***

potential benefits of erythropoeitin could include reduction of hypoxic vasodilation, lower venous return, regression of left ventricular dilation; increased oxygen uptake by cardiac myocytes; in addition of a cardioprotective anti-apoptotic role of erythropoietin and increased capacity to buffer hypoxic stress conferred by higher hemoglobin concentrations***(Robert ., 2008)***.

We studied the effect of anemia correction with erythropoietin (EPO) on Hb, RBC count, and HCT value , renal function parameters, B-type natriuretic peptide (BNP) levels and echocardiography ,we also analyzed the effect of EPO therapy on NYHA class after 3 months in comparison with a population undergoing to standard therapy for treatment of anemia.

EPO treatment reduced BNP levels in patients with cardio-renal anemia syndrome. The correction of anemia by EPO treatment appears to be able to improve clinical outcome in this subset of patients with heart failure, detected by significantly decreased BNP level by 33.8% in comparison to non significant decreased BNP level by 17.5% but worse echo changes detected by significant decreased EF% by 9.7%,in population exposed to standard therapy.

Conclusion &Recommendation

Correction of anemia in patients with CRS by rHuEpo leads to an improvement presented clinically by changed NYHA classification and by echocardiography (volumes , mass and wall motion ↑EF). All these positive changes occur together with BNP level decrease and appear related to anemic status correction and by enhanced reendothelialization of injured arterial vessels. It is now well known that EPO has anti-apoptotic effects in cells other than erythroid progenitor cells, which is considered to be independent of EPOs erythropoietic activities.

That was achieved by recommended use of subcutaneous recombinant human erythropoietin (rHuEpo), by dose(80-120 units /kg/week) in patients with cardio-renal anemia syndrome with avoidance of higher targets of hemoglobin, leading to higher blood pressure levels or greater requirements for antihypertensive therapy as most guidelines suggest that target hemoglobin should be about 11g/dl.

Erythropoietin therapy needs assessment of individual response by checking hemoglobin every 2-4 weeks as hyporesponsiveness may occur.