Erythropoietin-induced progenitor cell mobilisation in patients with acute ST-segment-elevation myocardial infarction and restenosis

Abstract:
Erythropoietin improves myocardial function and enhances re-endothelialisation. Aim of this study was to analyse progenitor cell mobilisation and restenosis in patients from the Regeneration of Vital Myocardium in ST-Segment Elevation Myocardial Infarction by Erythropoietin (REVIVAL-3) study. Patients with STEMI undergoing percutaneous coronary intervention (PCI) were randomly assigned to Epoetin beta (EPO) (n=68) or placebo (n=70). Drug-eluting stents (DES) were utilised in 93% of patients receiving EPO and in 95% of patients receiving placebo (p=0.83). Serial venous blood samples were drawn; CD133+ progenitor cells were quantified by four-colour flow cytometry and cytokines interleukin (IL)-1 beta, IL-6, IL-8, IL-10, IL-12 and tumour necrosis factor (TNF) alpha were analysed by cytometric bead array. Forty-eight hours after PCI a significant increase in CD133+ progenitor cells was observed in the EPO group. Yet, no differences in plasma cytokines were found. Quantitative coronary angiography after six months revealed an increase in segment diameter stenosis in the EPO group (32 +/- 19% vs. 26 +/- 14%, p=0.046). However, this increase in neointima generation was not associated with progenitor cell
mobilisation. EPO in patients with STEMI treated with PCI is associated with an increase in diameter stenosis that is not associated with circulating progenitor cells.