Effects of G-CSF on systemic inflammation, coagulation and platelet activation in patients with acute myocardial infarction.

Abstract:
In the prospective, randomised, double-blind, placebo-controlled Regenerate Vital Myocardium by Vigorous Activation of Bone Marrow Stem Cells (REVIVAL)-2 trial patients with acute myocardial infarction (AMI) and successful mechanical reperfusion received granulocyte-colony stimulating factor (G-CSF, 10 ?g/kg KG s.c.) or placebo for 5 days. Aim of this substudy was to assess the impact of G-CSF on systemic inflammatory and procoagulant responses and platelet activation. Before and five days after G-CSF (n=56) or placebo (n=58) circulating cytokine concentrations of interleukin (IL)-1ß, IL-6, IL-8, IL-10, IL-12 and Tumor-Necrosis Factor-? (TNF-?) were measured. Prothrombin fragment F1+2 and Tissue Factor activity served as a measure for activated coagulation. Platelet activation was characterized by cell surface expression of the activated fibrinogen receptor (PAC-1), P-selectin and CD40L by flow cytometry. Administration of G-CSF was associated with elevated TNF-? and CRP concentrations compared to the placebo group after 5 days. Other cytokines (IL-1ß, IL-6, IL-8, IL-10, IL-12) were comparable after treatment with G-CSF. Similarly, circulating prothrombin fragments F1+2, TF activity and platelet activation did not differ in both groups. Treatment with G-CSF in
patients with AMI was associated with enhanced proinflammatory TNF-α and CRP levels but no activation of coagulation.