OBJECTIVES: The objective of this meta-analysis was to evaluate the effect of stem cell mobilization by granulocyte colony-stimulating factor (G-CSF) on myocardial regeneration on the basis of a synthesis of the data generated by randomized, controlled clinical trials of G-CSF after acute myocardial infarction (AMI).

BACKGROUND: Experimental studies and early-phase clinical trials suggest that stem cell mobilization by G-CSF may have a positive impact on cardiac regeneration after AMI. The role of G-CSF in patients with AMI remains unclear considering the inconsistent results of several clinical trials.

METHODS: For our analysis, PubMed, the Cochrane Central Register of Controlled Trials, conference proceedings from major cardiology meetings, and Internet-based sources of information on clinical trials in cardiology from January 2003 to August 2007 served as sources. Two reviewers independently identified studies and abstracted data on sample size, baseline characteristics, and outcomes of interest. Eligible studies were randomized trials with stem cell mobilization by G-CSF after reperfused AMI that reported data regarding the change in left ventricular ejection fraction (LVEF) at follow-up.

RESULTS: Ten trials using stem cell mobilization by G-CSF, including 445 patients, met the inclusion criteria. Significant improvement in LVEF at
follow-up was observed in both the G-CSF and placebo groups. Compared with placebo, stem cell mobilization by G-CSF did not enhance the improvement of LVEF at follow-up (mean difference 1.32% [95% confidence interval -1.52 to 4.16; p = 0.36]). Moreover, the mean difference of reduction of infarct size between the treatment and placebo groups was -0.15 (95% confidence interval -0.38 to 0.07, p = 0.17). CONCLUSIONS: Cumulatively, available evidence does not support a beneficial effect of G-CSF in patients with AMI after reperfusion.