STEM CELLS

Injection during CABG surgery helps failing hearts

In a study of patients with chronic heart failure as a result of a previous myocardial infarction (MI), injection of stem cells during CABG surgery improved heart function. “Our results expand the indications of stem cell therapy and might speed up the translation of stem cell therapy from bench to bedside,” says Shengshou Hu from the Chinese Academy of Medical Sciences (Beijing), one of the directors of the study.

Previous studies have shown that a timely injection of stem cells into the heart can improve myocardial regeneration from acute ischemic conditions such as MI. With the present study, Hu and his team aimed to exploit the regenerative potential of stem cells for the treatment of chronic ischemic cardiomyopathies.

During 2006–2009, the researchers recruited 65 patients who had suffered an MI more than 3 months before and whose left ventricular ejection fraction (LVEF) was severely reduced (<30% of normal values). Hu and colleagues obtained bone marrow samples from 60 participants (mean age of ~60 years) who proceeded to CABG surgery and received an average of 4 bypasses. The patients were randomly assigned to be given either bone-marrow-derived mononuclear cells or a placebo during the procedure. As both preparations were injected into the bypass grafts while the heart was arrested, cells might have remained longer

in the heart and distributed more-evenly compared with techniques that are used after acute MI, say the researchers.

6 months after surgery, the LVEF of patients who received stem-cell injections had recovered more than that of participants who had received the placebo (+48.4% vs. +27.5%). Patients in the stem-cell group also performed better in a 6-min walking test and plasma levels of B-type natriuretic peptide decreased more than in patients in the placebo arm. The team did not, however, detect differences in myocardial perfusion, which they assessed by single-photon emission tomography.

Encouraged by these results, Hu now plans to launch a multicenter study with more patients and a longer follow-up, and is keen to study the biological fate of the stem cells in different parts of the heart.

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Original article Hu, S. et al. Isolated coronary artery bypass graft combined with bone marrow mononuclear cells delivered through a graft vessel for patients with previous myocardial infarction and chronic heart failure: a single-center, randomized, double-blind, placebo-controlled clinical trial. *J. Am. Coll. Cardiol.* 57, 2409–2415 (2011).

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