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INTRACORONARY AUTOLOGOUS STEM CELL THERAPY FOR ACUTE MYOCARDIAL INFARCTION: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMISED CONTROLLED TRIALS

Yao Kuiwu, Zhang Liangdeng, Wang JieGuang An Men Hospital, China Academy of Chinese Medical Sciences, Beijing, China

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Objective We undertook a systematic review and meta-analysis to investigate the effects of autologous stem cell (SC) therapy for patients with acute myocardial infarction (AMI).

Methods We searched Medline, Embase, and the Cochrane Library for randomised controlled trials (RCTs) using intracoronary autologous SC therapy in AMI patients with follow-up of at least three months, published between 1990 and April, 2011. We assessed the effects of intracoronary autologous SC therapy for AMI compared with control treatment. Outcomes analysed were left ventricular ejection fraction (LVEF), infarct sise, regional wall motion, major cardiovascular events, clinical adverse events, and quality of life (QOL).

Results We included 27 trials providing data for 1326 patients, and pooling was performed with random effect. Autologous SC contains bone marrow SC (19 trials), peripheral blood SC (8 trials), and bone marrow mesenchymal SC (1 trial). Six trials collected peripheral blood SC mobilised by granulocyte colony-stimulating factor. Patients received intracoronary autologous SC therapy from baseline had a significant improvement in LVEF compared with control groups (5.94% vs 3.28% mean increase, $p<0.05$), as well as mean reduction in infarct size (4.51% vs 3.13%, $p<0.05$) and amelioration in regional wall motion ($p<0.05$). The recurrent AMI, repeat revascularisation, cardiac failure and death were reduced by intracoronary autologous SC therapy compared with control groups ($p<0.05$). The incidence of clinical adverse events were similar between autologous SC therapy and control groups ($p>0.05$), while the QOL was in favour of autologous SC therapy ($p<0.01$).

Conclusions Intracoronary autologous SC therapy, as compared with control treatment, is relatively effective and safe at improving both of cardiac function and QOL for AMI patients. Relevant mechanisms studies and further larger multicenter RCTs need to advance heart regenerative medicine from bench to beside and beyond.