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EFFECTS OF AUTOLOGOUS BONE MARROW MONONUCLEAR CELLS TRANSPLANTATION THROUGH CORONARY ARTERY BYPASS GRAFTING IN PATIENTS WITH OLD MYOCARDIAL INFARCTION ASSESSED BY MRI: A RANDOMISED, DOUBLE-BLIND, PLACEBO-CONTROLLED PILOT TRIAL

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Objectives Recent studies have shown that autologous bone marrow mononuclear cell (aBM-MNC) transplantation can be effectively performed in human beings either by the coronary route or by endoventricular injections. However, scanty data are available for patients undergoing coronary artery bypass grafting (CABG). Accordingly, the aim of this study was to use an 'one-stop' non-invasive imaging examination-MRI to evaluate the feasibility and safety of aBM-MNC transplantation in patients with old myocardial infarction (OMI) undergoing CABG.

Methods We did a randomised, double-blind, placebo-controlled study in 50 patients (male=47, female=3, age 57.48 ± 7.98 years) with OMI. The patients were randomly divided into two groups (group A: CABG+ aBM-MNC, group B: CABG only). Preoperative global left ventricular functions and scar tissue were measured by MRI. The therapeutic effects were assessed by MRI 1 year after aBM-MNC transplantation.

Results all the patients were treated without major complications. There is no evidence of new ventricular arrhythmia or neoplasia. The LVEF was improved 13.5% in group A, while 8.04% in group B ($p=0.04$), LVEDV/m² and LVESV/m² were decreased by 24.21 ± 5.86 ml/m² and 29.22 ± 5.05 , respectively, which were significantly different from that in group B (3.13 ± 7.23 ml ($p=0.028$) and 7.71 ± 5.93 ($p=0.008$)). The cardiac output (CO), cardiac index (CI) and cardiac mass (CM) did not show significant difference between the two groups. Compared with group B, aBM-MNC group was associated with a significant reduction in myocardial infarct size (25.4% vs 3.5%, $p=0.016$).

Conclusions Comprehensive in vivo CMR reveals reversed remodeling and improved systolic function and scar characteristics after aBM-MNC transplantation. CABG+aBM-MNC transplantation can lead to comparable improvements of left ventricle in chronic myocardial infarction.