EFFECTS OF AUTOLOGOUS BONE MARROW MONONUCLEAR CELLS TRANSPLANTATION THROUGH CORONARY ARTERY BYPASS GRAFTING IN PATIENTS WITH CHRONIC MYOCARDIAL INFARCTION ASSESSED BY MAGNETIC RESONANCE IMAGING: A RANDOMIZED, DOUBLE BLIND, PLACEBO-CONTROLLED PILOT TRIAL

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PURPOSE:

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 chronic myocardial infarction(MI) undergoing CABG.

METHOD AND MATERIALS

We did a randomised, double-blind, placebo-controlled study in 50 patients (male=47, female=3, age 57.48±7.98y) with Chronic MI. The patients were randomly divided into 2 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 one 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±5.86ml/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) didn't 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).

CONCLUSION

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 infaction.

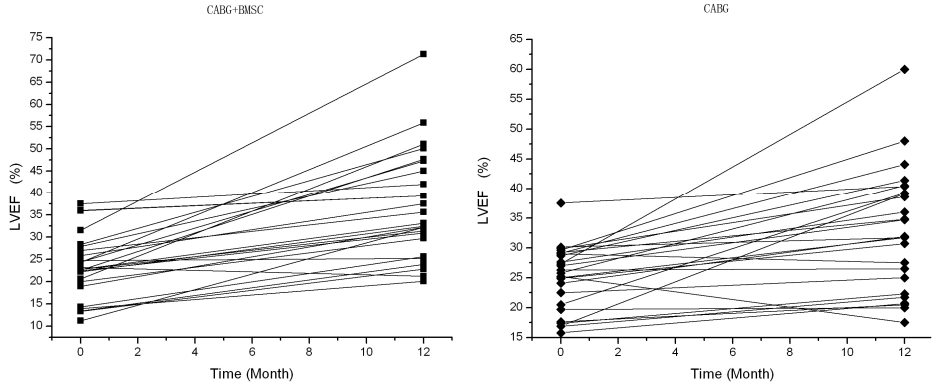

Table 1: LV volume and mass indices, global and regional LV function, and late contrast enhancement before BMCs transfer(Baseline) and at 12 months' follow-up

	Baseline		12 months later		Difference		T Value	*P*
	CABG	CABG+BMSC	CABG	CABG+BMSC	CABG	CABG+BMSC		
LVEDV index(ml/m^2)	98.6 (23.6)	107.0 (30.0)	95.5(40.8)	82.8 (22.3)	-3.1 (36.1)	-24.2 (29.3)	-2.264	0.028
LVESV index(ml/m^2)	74.3 (19.4)	83.2(26.8)	66.6 (36.3)	54.0(21.8)	-7.7 (29.6)	-29.2 (25.3)	-2.761	0.008
Global LVEF(%)	24.9 (5.4)	23.4(7.1)	33. 0(10. 2)	36.9 (12.3)	8.0 (8.6)	13.5 (10.3)	2.042	0.047
SV(ml)	44.9 (13.1)	44.5 (13.8)	52.0(13.4)	51.9 (12.9)	7.1(16.4)	7.4 (13.0)	0.076	0.939
CO L/min	3.2 (1.0)	3.01 (0.9)	3.7(0.8)	3.5 (1.1)	0.4 (1.3)	0.5 (1.1)	0.171	0.865
CI (L/min/m^2)	1.8 (0.5)	1.7(0.5)	2.1(0.5)	2.0(0.6)	0.3(0.8)	0.3(0.6)	0.249	0.805
LV mass index	128.8 (33.7)	123.8 (33. 7)	115.8(27.9)	120.1(35.3)	-13.1(30.8)	-3.7(31.1)	1.072	0.289
SWTI (%)	12.1(8.4)	11.5(7.8)	16.5(9.7)	18.4(11.4)	4.5(19.5)	6.9(23.8)	2.979	0.005
SWTB (%)	21.3(10.1)	19.7(9.4)	30.2(15.3)	33.7(16.2)	8.9(16.5)	14.0(21.9)	2.592	0.013
LCE (cm^3)	33.4(11.9)	34.9(12.0)	27.4(19.7)	25.5(18.0)	6.0(17.7)	9.4(15.4)	-1.676	0.100

SWTI: Systolic wall thicking in infarct area, SWTB: Systolic wall thickening in border zone; Late contrast enhancement (LCE)