

SCIPIO

Cardiac Stem Cells in Patients with Ischaemic Cardiomyopathy

Bolli R. et al.

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Ischaemic Cardiomyopathy

„Ischemic Cardiomyopathy refers to a state of severe LV dysfunction caused by chronic coronary artery disease (CAD).“¹

Previous Studies

- 10 years ago: first success in infusion of bone marrow stem cells in mice and a patient
- rather modest successes
- application mostly in AMI
- encouraging results of application of CSCs in animal models²

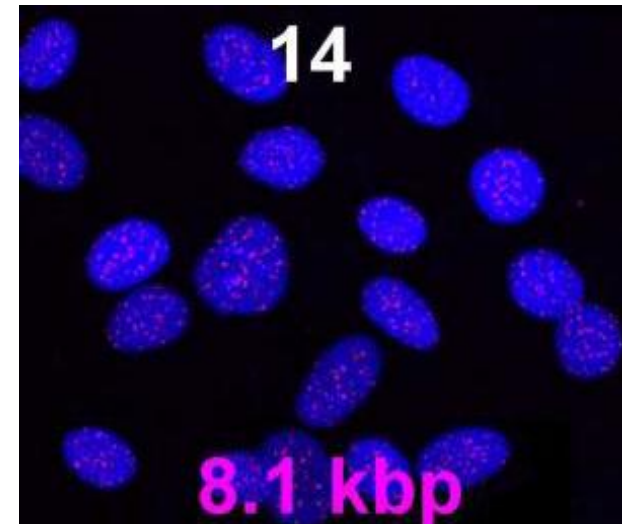
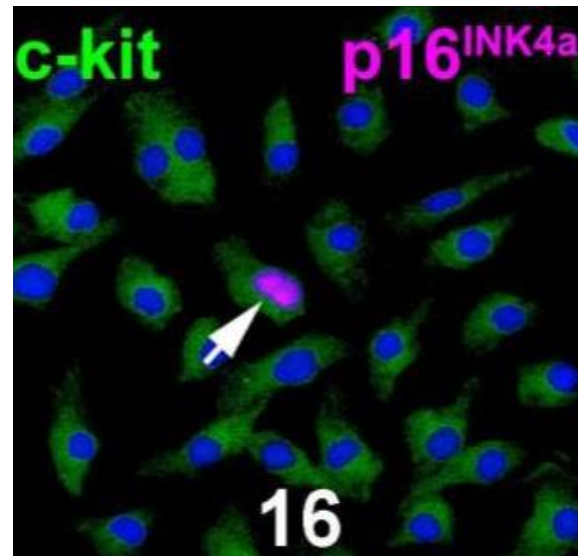
Methods

- phase 1, open-label trial
- inclusion criteria
 - CABG
 - LVEF \leq 40%
 - myocardial infarction with evidence of a scar
 - < 75 years

Phase A	9 treated patients	4 control group patients
Phase B	7 treated patients	3 control group patients

Methods

- right atrial appendage
- Ham's F12 medium containing Collagenase NB 6
- isolation of c-kit-positive CSCs
- Fish
- PCR
- p16^{INK4a}
- FACS



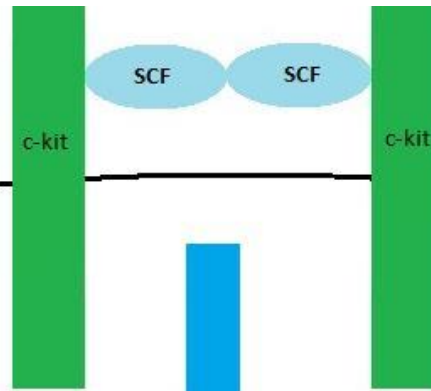


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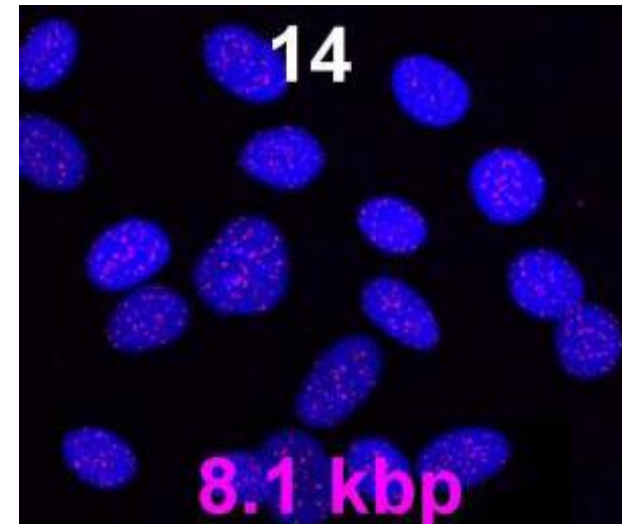
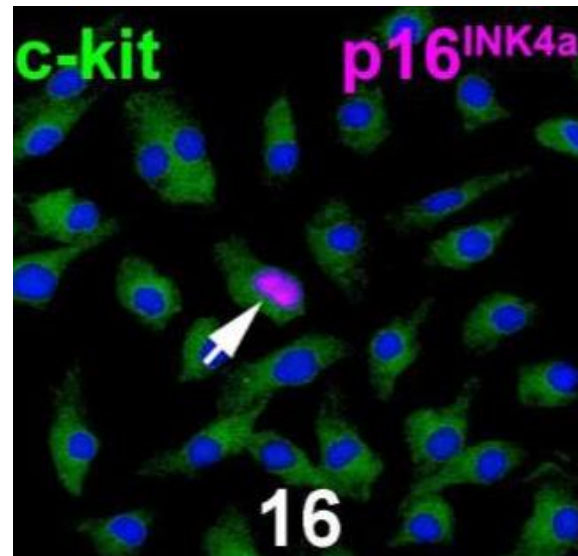


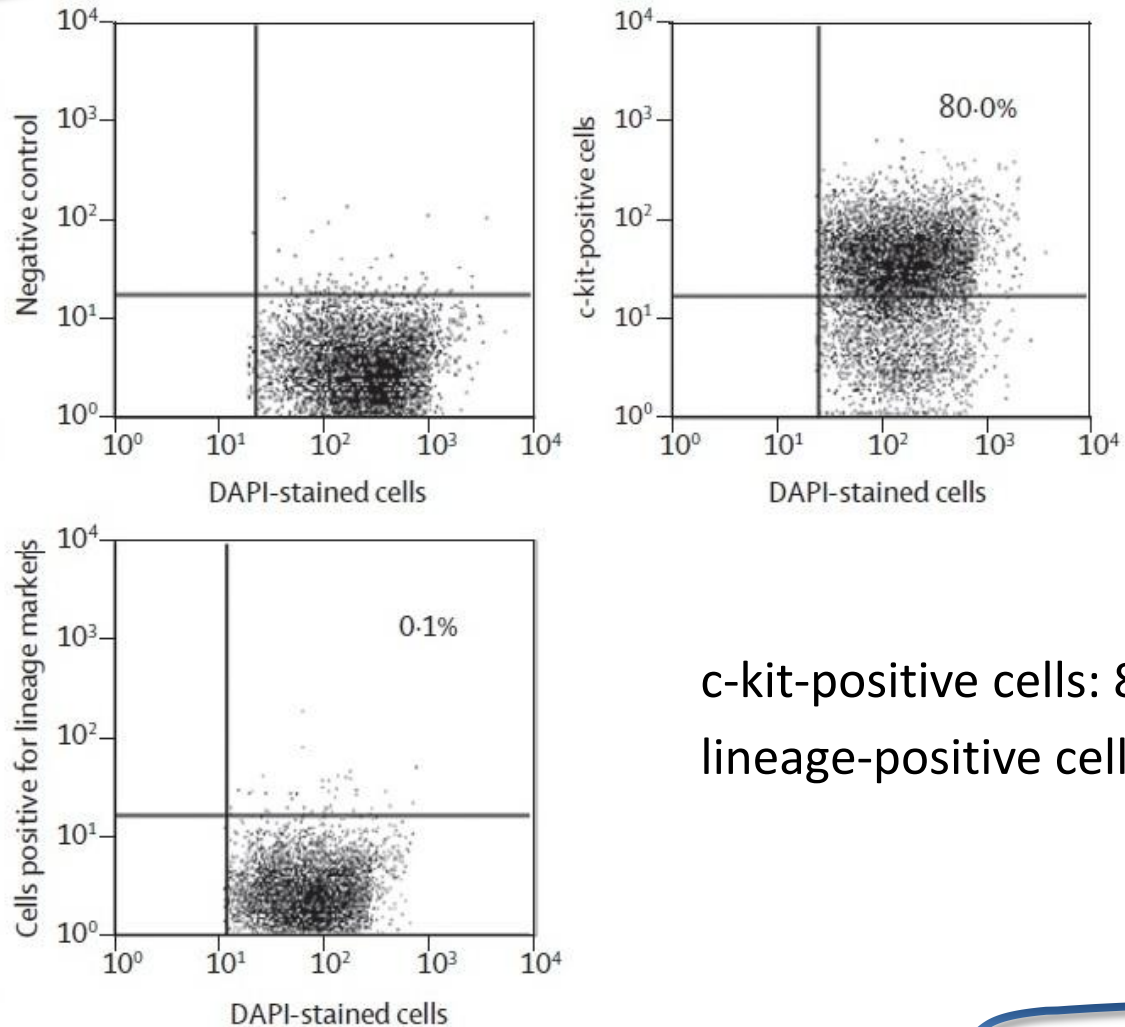
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Methods

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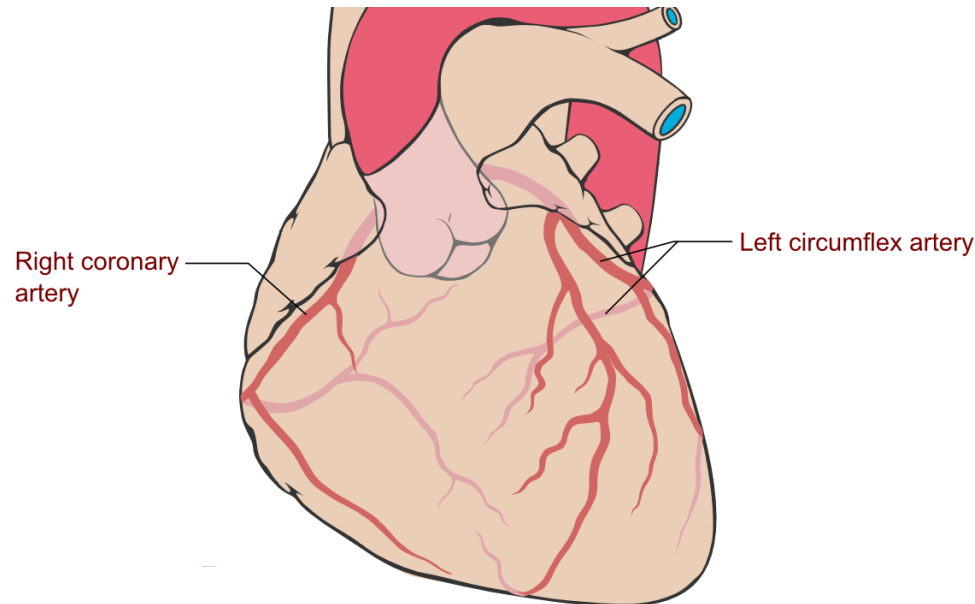




c-kit-positive cells: 88%
lineage-positive cells: 1,1%

Methods

- intracoronary infusion at a mean of 113d after CABG
- 1 million CSCs into anterior wall infarcts
- 500 000 CSCs into LCX or RCA



Methods

	2D/3D transthoracic echocardiogram	Routine laboratory tests	Physical examination	NYHA class assessment	MLHFQ	cMRI	24h ECG
Before CSC infusion	×	×	×	×	×	×	
24h		×	×				
1 week		×	×				×
2 weeks		×	×				×
1 month	×	×	×	×			
4 months	×	×	×	×	×	×	
8 months		×	×				
12 months	×	×	×	×	×	×	

Results

Ejection Fraction

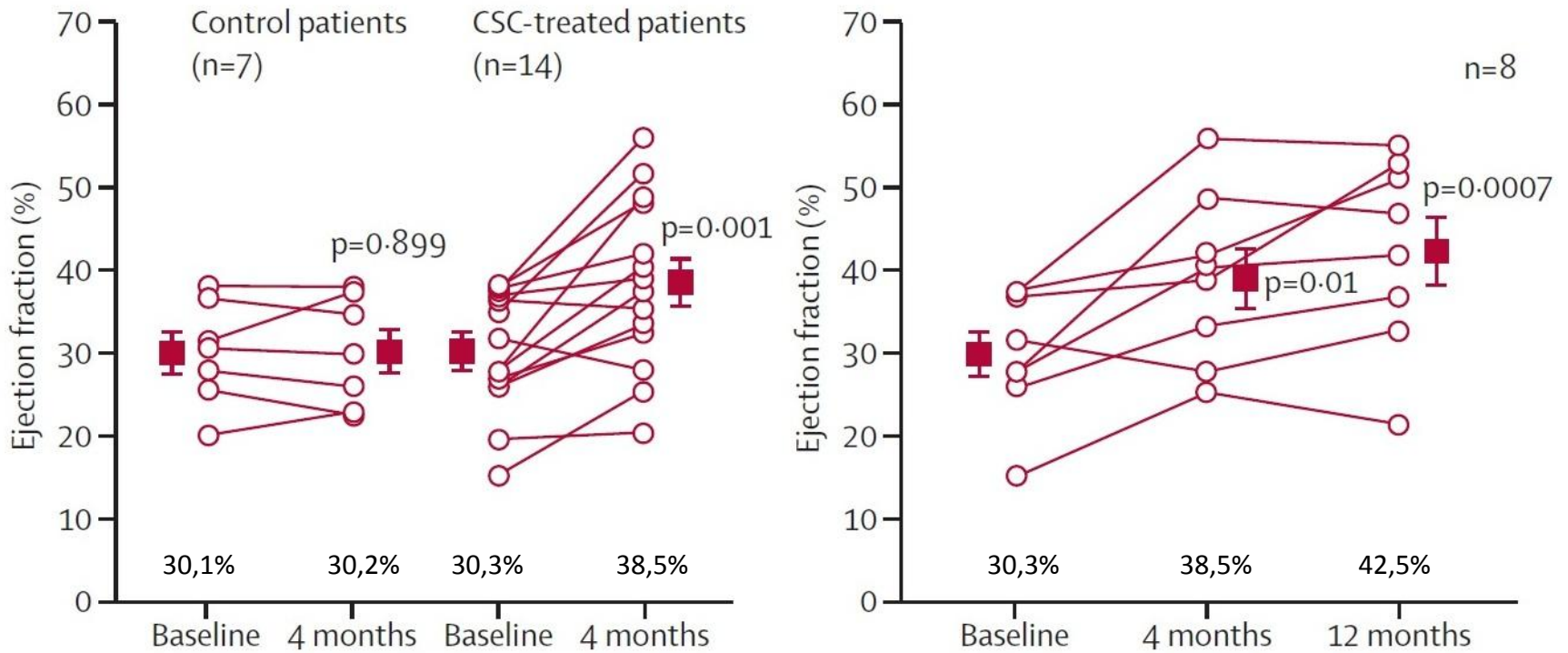


Figure 5: BOLLI, R. et al. Cardiac stem cells in patients with ischaemic cardiomyopathy (SCIPIO): initial results of a randomised phase 1 trial (2011)

Results

Wall Motion Score Index

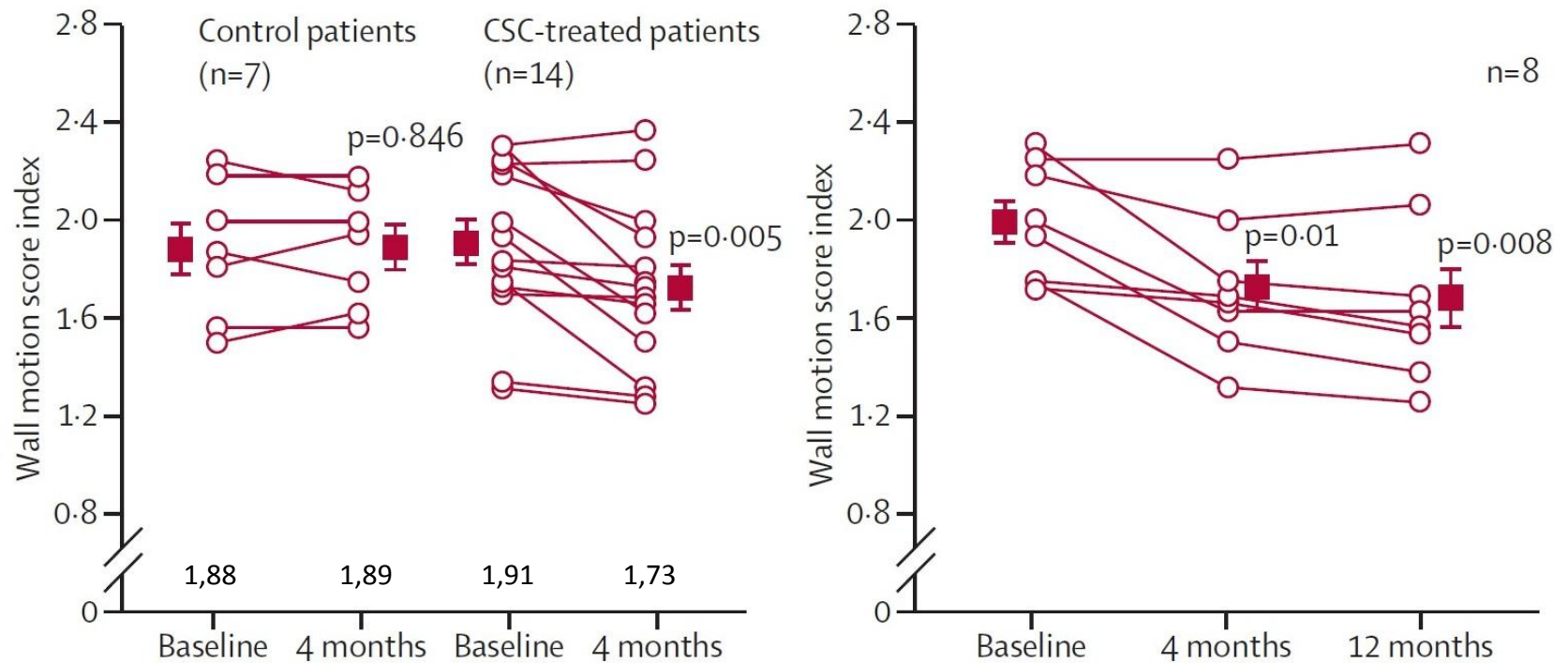
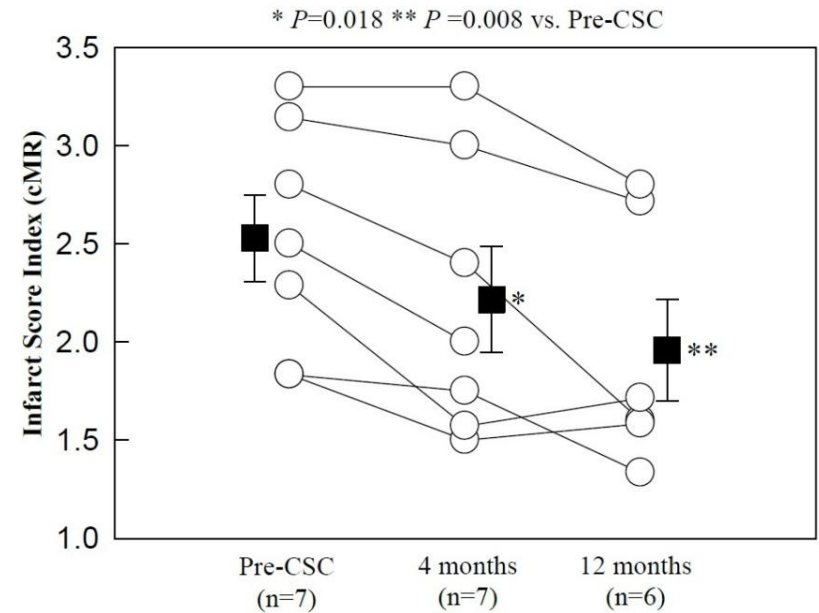
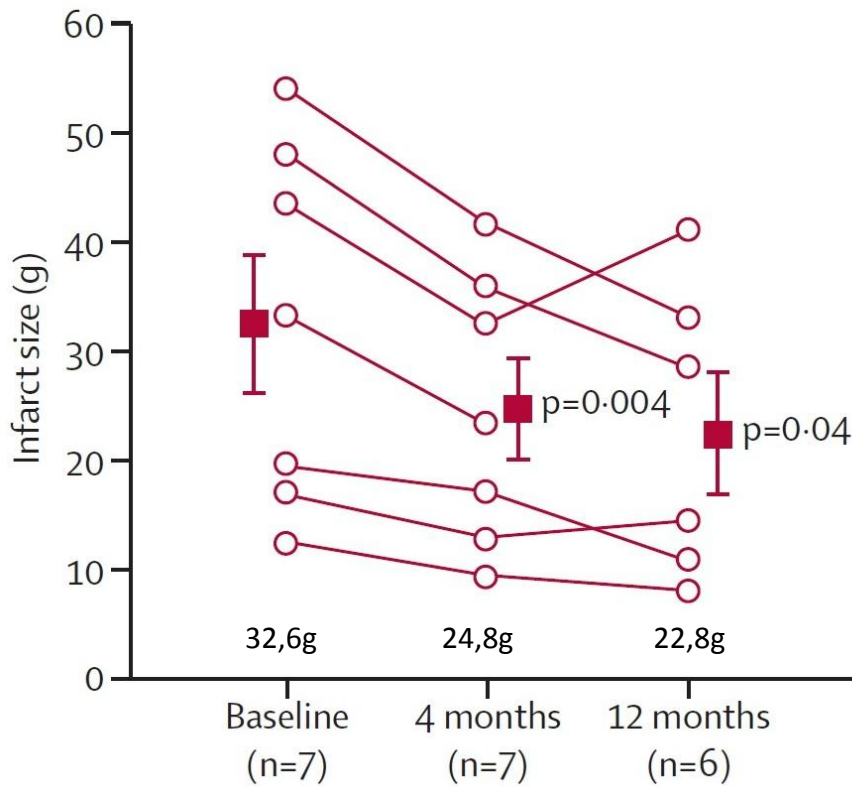


Figure 6: BOLLI, R. et al. Cardiac stem cells in patients with ischaemic cardiomyopathy (SCIPIO): initial results of a randomised phase 1 trial (2011)

Results

Infarct Size



Results

NYHA Functional Class

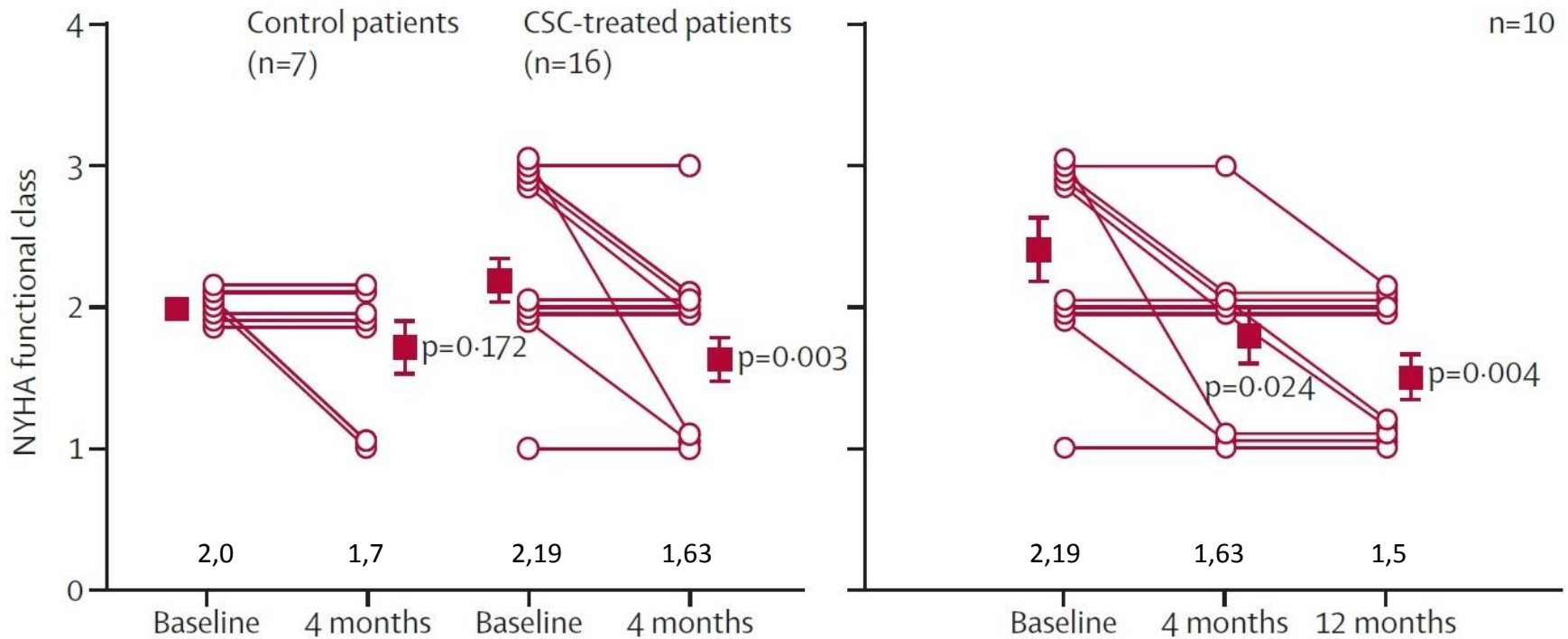


Figure 9: BOLLI, R. et al. Cardiac stem cells in patients with ischaemic cardiomyopathy (SCIPIO): initial results of a randomised phase 1 trial (2011)

Results

MLHFQ

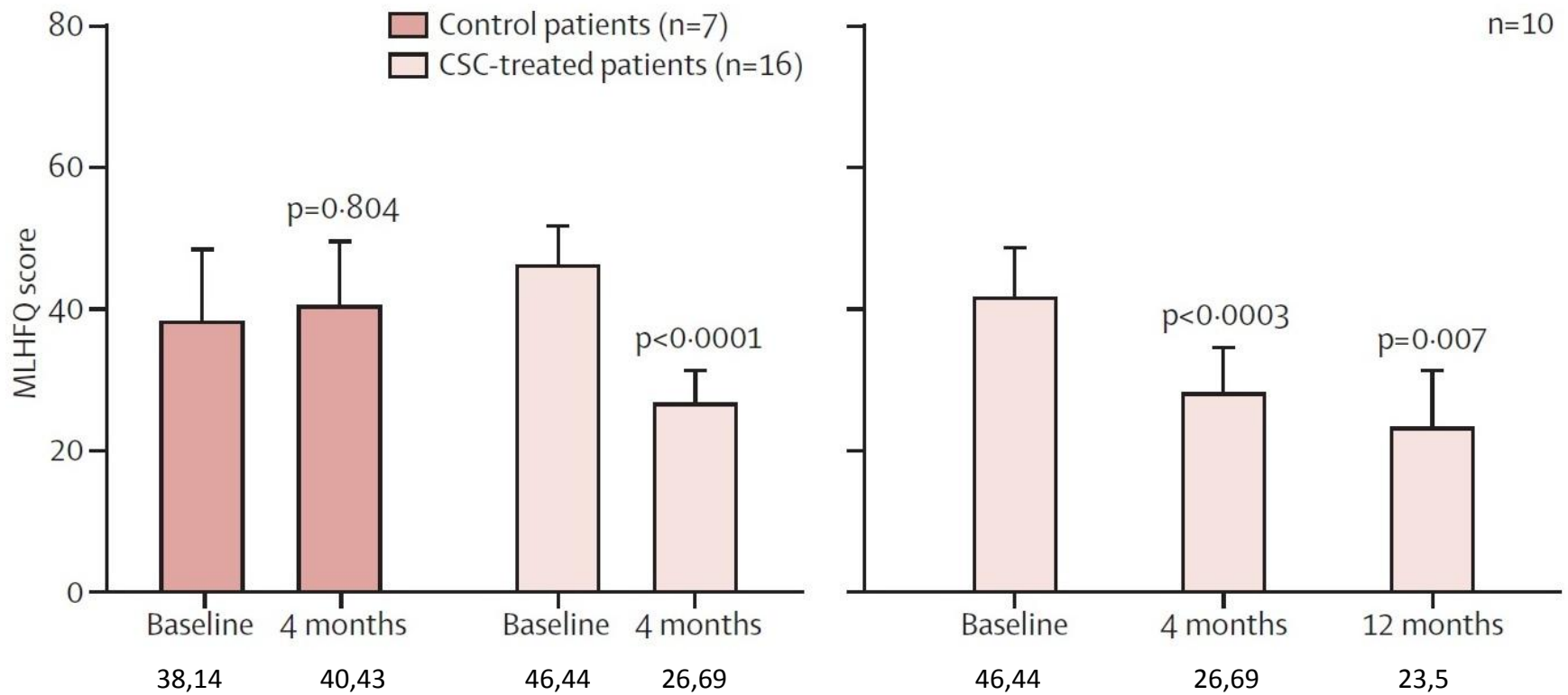


Figure 10: BOLLI, R. et al.. Cardiac stem cells in patients with ischaemic cardiomyopathy (SCPIO): initial results of a randomised phase 1 trial (2011)

Results

Adverse Events

	Treatment group (n=16)	Control group (n=7)
Death	0	0
Myocardial infarction (peri-procedural or post-procedural)	0	0
New tumour	0	0
Ventricular arrhythmia	0	0
Systemic infection (within 1 year)	0	0
Stroke	0	0
Allergic reaction	0	NA
Procedure-related event*	1 (6%)	NA
Revascularisation	0	1 (14%)
Hospital admission for heart failure†	1 (6%)	0
Hospital admission for angina	1 (6%)	2 (29%)

NA=not applicable. *Tortuous left internal mammary artery engaged for cardiac-stem-cell infusion had intimal dissection after balloon deflation; drug-eluting stent was placed without complication. †Secondary to worsening valvular disease.

Table 2: Adverse events in cardiac-stem-cell-treated and control patients

Conclusion

- congruent with preclinical studies
- 2 theories concerning mechanism
 - CSCs differentiate
 - activation of resident CSCs
- positive and no adverse effects, but only a small number of patients and no masking