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MESENCHYMAL STEM CELLS THERAPY IN PATIENTS WITH CHRONIC CORONARY ARTERY DISEASE: 12 MONTHS FOLLOW-UP

ACC Poster Contributions
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Background We have evaluated the feasibility, safety and efficacy of autologous MSC-derived endothelial progenitor cell treatment to improve vascularization in patients with stable chronic coronary artery disease (CAD).

Methods 31 patients with stable chronic CAD (Age: 66+7 years (mean±SD), 26 men and 5 females) with angina CCS 2-3 and reversible myocardial ischemia on an adenosine stress single photon emission computerized tomography (SPECT) and no further revascularization options were included. Mesenchymal stem cells (MSCs) were isolated from the bone marrow and culture expanded for 6 - 8 weeks and the last week stimulated by rhVEGF-A165 to differentiate into endothelial precursor cells. A total of 3 - 62 Mill MSCs were injected directly into the myocardium with reversible ischemia on SPECT.

Results It was feasible to establish in-hospital culture expansion of autologous MSCs and safe to treat the patients with intramyocardial injections of a total of 3 - 62 x106 cells using the NOGA-XP® system. Patients treated with MSC had significant increased exercise capacity ($p<0.001$) at 6 months but not at 12 months follow-up ($p=0.07$). At both 6 and 12 months follow-up there was a significant reduction in CCS ($p<0.001$), angina attacks ($p<0.001$) and nitroglycerine consumption ($p<0.001$), and in all 6 Seattle Angina Questionnaire evaluations ($p<0.001$ for all). Patients were divided into two groups: group 1 treated with 10.9±2.6 mill (n=16) and group 2 treated with 32.9±11.9 mill MSCs (n=15). For all the parameters there was a tendency towards improved outcome with increasing number of cells. MSC treatment improved left ventricular ejection fraction ($p<0.001$) and systolic wall thickening ($p<0.02$) at 6 months follow-up. These measurements were not performed at 12 months.

Conclusion The study demonstrates that treatment with aoutologous MSC was safe. Moreover, 12 months follow-up data demonstrated in patients treated with MSCs a highly significant improvement in clinical symptoms and quality of life. In addition, improvement in cardiac function and exercise capacity was demonstrated after the treatment.