



ACC.14

TCT@ACC-12 | innovation in intervention

A902

JACC April 1, 2014

Volume 63, Issue 12



Heart Failure and Cardiomyopathies

CLINICAL FEASIBILITY STUDY TO DETECT ANGIOGENESIS FOLLOWING BONE MARROW STEM CELL TRANSPLANTATION IN CHRONIC ISCHAEMIC HEART FAILURE

Poster Contributions

Hall C

Sunday, March 30, 2014, 3:45 p.m.-4:30 p.m.

Session Title: Approaches to Advanced Heart Failure: From VAD, Transplant, Palliative Care to New Percutaneous Therapies

Abstract Category: 12. Heart Failure and Cardiomyopathies: Clinical

Presentation Number: 1221-189

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Background: Bone marrow derived stem cell (BMSC) therapy for ischaemic heart failure has shown promising results in recent clinical trials. There remains a need for clinical mechanistic studies to understand the biological effects of cellular therapy on human cardiac tissue to help bridge the transition from bench to bedside. The REGENERATE-IHD study is an on-going double-blind randomised controlled trial assessing the safety and efficacy of different routes of delivery of BMSCs in patients with ischaemic heart failure. We have designed a sub-study to assess the feasibility of a novel imaging technique to detect angiogenesis following intracoronary BMSC transplantation.

Methods: Nine patients who had been randomised to receive intracoronary injection of G-CSF mobilised BMSCs or control (serum) were included in this sub-study. Patients underwent SPECT imaging using a novel radiotracer peptide (99mTc-NC100692), which has a high affinity for the $\alpha v\beta 3$ integrin, an angiogenesis related integrin. This was repeated 4 days after intracoronary injection of BMSCs/control to assess for neoangiogenesis.

Results: The imaging study was well tolerated with no adverse effects. Myocardial tracer uptake was detectable at baseline in all nine patients with no myocardial uptake seen in two control patients used for comparison. Baseline uptake appeared to correlate with baseline ejection fraction but changes with therapy did not reach statistical significance.

Conclusions: SPECT imaging with a 99mTc-NC100692 is feasible in patients with heart failure with baseline activity suggesting persistent angiogenesis in patients with remote myocardial infarction. Further appropriately designed studies are warranted to assess the ability of this exciting molecular imaging technique to detect angiogenesis associated with cell therapy.

ClinicalTrials.gov Identifier: NCT00747708