PreSERVE-AMI: A Randomized, Double-Blind, Placebo-Controlled Clinical Trial of Intracoronary Infusion of Autologous CD34+ Cells in Patients With Left Ventricular Dysfunction Post STEMI

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Background: ST segment Elevation Myocardial Infarction (STEMI) affects 160,000 annually in the US. Guidelines direct immediate revascularization and adjunctive medical therapies. Yet STEMI victims remain at risk for infarct expansion, heart failure, reinfarction, repeat revascularization and death. In pre-clinical studies, human CD34+ stem cells are angiogenic within ischemic myocardium, improving perfusion and function. A precedent Phase 1 study demonstrated feasibility, safety and bioactivity of intracoronary infusion of autologous CD34+ cells in patients with LV dysfunction (LVD) post-MI and identified a threshold dose of 10M cells associated with improved infarct region perfusion.

Methods: PreSERVE-AMI is a Phase 2, randomized, double-blind, placebo-controlled trial performed at 60 sites in the US. Those with LVD (EF=48% by CMR) =4 days post-STEMI underwent mini bone marrow harvest and were randomized 1:1 to (A) autologous CD34+ cells (minimum dose of 10M±20% cells in autologous serum) or (B) autologous serum. (A) or (B) was delivered via stop-flow method for intracoronary infusion. The primary efficacy endpoint was change in resting myocardial perfusion measured by gated SPECT over 6 months. Ventricular function was also assessed
The primary safety endpoint was occurrence of AEs, SAEs and MACE (CV mortality, heart failure, reinfarction, revascularization).

**Results:** 161 patients were randomized and received intracoronary infusion (from Jan 2012 to Dec 2013). Mean age was 57.3±10.6, 81% were men and minority had history of HF, prior MI or DM (12%, 17%, 27%, respectively). LVEF by CMR was 36.5±9.1. The 6-month data will be presented.

**Conclusions:** PreSERVE-AMI represents the largest study of cell-based therapy for STEMI completed in US and will determine endpoints, sample size and suitability of autologous CD34+ cell therapy for upcoming Phase 3 study in patients with LVD post STEMI who are at risk for death and major morbidity.

**Disclosure:**

A.A. Quyyumi, NeoStem, Inc, Modest, Consultant/Advisory Board; A. Vasquez, Jannsen Pharmaceutical, Modest, Speakers Bureau; Edwards Lifesciences, Modest, Speakers Bureau; M. Klapholz, Investigator - Clinical Trial, Modest, Research Grant; D. Kereiakes, Harvard Clinical Research Institute, Modest, Consultant/Advisory Board; Ablative Solution, Inc, Modest, Consultant/Advisory Board; Boston Scientific, Significant, Consultant/Advisory Board; Abbott Vascular, Significant, Consultant/Advisory Board; REVA Medical Inc., Significant, Consultant/Advisory Board; G.L. Schaer, Steering Committee Member, RENEW Trial, Baxter, Modest, Other; Steering Committee Member, ixCELL Trial, Aastrom, Modest, Other; K. Fujise, Eli Lilly, Modest, Speakers Bureau; St. Jude Medical, Modest, Consultant/Advisory Board; A. Abdel-Latif, None; R.S. Iwaoka, None; A.E. Denktas, None; R.S. Gammon, None; S.C. Frohwein, None; V.S. Kasi, Astrazeneca, Significant, Speakers Bureau; M.R. Tamberella, None; C. Toma, None; N. Dib, None; T.K. Bajwa, None; R. Schatz, None; T.D. Henry, None; M. Cohen, None; D.M. Shavelle, None; G.W. Barsness, None; C. Davidson, None; T. Moss, Neostem, Inc., Significant, Employment; P. Hyde, Neostem, Inc., Significant, Employment; A. Kanakaraj, Neostem, Inc., Modest, Employment; V. Druker, Neostem, Inc., Significant, Employment; L. Dich, Neostem, Inc., Significant, Employment; J. Sackner-Bernstein, NeoStem, Inc., Significant, Employment; R. Preti, Neostem, Inc., Significant, Employment; D. Losordo, NeoStem, Inc., Significant, Employment; A. Pecora, Neostem, Inc., Significant, Employment.