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Heart Failure Improvement After Autologous Bone Marrow Mononuclear Cells (abmmc) Transplantation

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Abstract:

Background:

Pilot studies suggest that intracoronary transplantation of unselected ABMMC cells may improve Left Ventricular Ejection Fraction (LVEF) in heart failure (HF)

Methods:

18 patients were enrolled and completed 1 year follow up. Patients underwent SPECT evaluation, all had ejection fraction < 35%, 6 patients were randomly allocated to the control group and 12 in the Bone Marrow Cells (BMC) group, median age 65 years old, male/female ratio 17/1; all with ischemic cardiomyopathy. All of cohort had NYHA class of III with maximal medical therapy and median basal LEVF was 28.38% (SD=6.5%). Median number of mononuclear and CD34+ cells infused were 8.1×10^8 and 1.2×10^7 respectively in a 50 cc delivered retrograde via coronary sinus approach using balloon occlusion "over wire" for 8 to 10 minutes. No study related adverse events were observed.

Results:

After a median time of 21 days, patients in the BMC group had relief of dyspnea symptoms and improvement in functional class. At 1 year, NYHA class improved in 92% of the patients in the BMC group by at least 1 class and no improvement in the control group. Mean improvements of LVEF post BMC transplantation were 6.18% (SD=4.94%) and 6.7% (SD=4.07%) at rest and stress SPECT

respectively. Rest LVEF at baseline and after one-year follow up between the BMC and control groups demonstrates significant difference (4.9% vs 1.6%, $p=0.006$), as well as the comparison of change in stress LVEF in both groups (6.7% vs 0.11%, $p<0.001$).

Conclusion:

Infusion of progenitor cells into the coronary sinus is safe and feasible in the ischemic HF. It is associated with significant improvement in symptoms, functional capacity and LVEF. Larger randomized studies are in progress to build upon this pilot study.

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