

LONG TERM BENEFIT OF AUTOLOGOUS BONE MARROW TRANSPLANTATION

BY RETROGRADE TECHNIQUE IN TERMINAL HEART FAILURE

(LIBERTY study)

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Background: Randomized studies suggest that intracoronary transplantation of autologous cells may improve Left Ventricular Ejection Fraction (LVEF) in heart failure (HF).

Methods: 40 patients were enrolled and completed 4 years follow up. Patients underwent SPECT evaluation; all had LVEF $\leq 25\%$, 20 patients with ischemic HF (IHF) and 20 patients with non-ischemic HF (nIHF). For IHF and nIHF at baseline: the median age was 67 and 64 years old respectively (ns); NYHA III/IV were 14/6 and 16/4 respectively (ns); median LVEF were 18.7% and 24.7% respectively (ns); median EDV were 281 ml and 242 ml respectively ($p=0.16$, ns) and median ESV were 217 ml and 189 ml respectively ($p=0.29$, ns). Median numbers of MNC & CD34+ cells were 12×10^8 & 23×10^6 respectively. Cells were delivered in 90 cc using a retrograde technique by coronary sinus approach using a balloon occlusion "over wire" for 10 to 15 minutes. No early or late study related adverse events were observed.

Results: After a median time of 21 days, patients in both groups had relief of dyspnea symptoms and improvement in functional class. All patients were evaluable at one year and 17 in each group for 4 years follow-up. Differences (Δ) and statistical difference (p) are shown

			1 YEAR
4 YEARS	IHF	nIHF	
IHF			

	(n=20)	(n=20)	(n=17)
(n=17)			
ΔNYHA grade reduction (p<0,001)	1 (p<0,001) 2 (p<0,001)	2 (p<0,001)	1
ΔLVEF (median, %) (p<0,001)	9.0 (p<0,001) 19.0 (p<0,001)	12.0 (p<0,001)	9.0
ΔEDV (median, ml) (p=0.054)	40.0 (p=0,002) 20.0 (p=0,089)	29.5 (p=0,021)	16.0
ΔESV (median, ml) (p=0,001)	35.5 (p<0,001) 41.0 (p<0,001)	42.0 (p<0,001)	31.0

Conclusions: Infusion of autologous bone marrow cells into the coronary vein is safe and feasible. It is associated with significant improvement in symptoms and functional capacity benefit. Both groups benefited in terms of LVEF improvement and lower ESV. Our data suggest that nIHF patients have a higher LVEF increment than IHF patient and lasting up to 4 years; revealing a high restoration of myocardial dysfunction. Further randomized studies are warranted.