



TCT@ACC-i2: Invasive and Interventional Cardiology

SAFETY AND EFFICACY OF CARDIAC CELL THERAPY: FIRST RESULTS OF THE MESS (META-ANALYSIS OF CARDIAC STEM CELL STUDIES) DATABASE INCLUDING INDIVIDUAL PATIENT DATA OF 13 RANDOMIZED AND 3 COHORT STUDIES

Oral Contributions

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Background: Meta-analysis of individual patient data (IPD) facilitates subgroup analysis for predictors and uses common definitions and cutpoints.

Methods: The MESS database (clinicaltrials.gov NCT01098591) involves 1395 IPD of 13 randomized and 3 cohort studies of patients with ischemic heart disease (IHD) and treated with cell therapies, containing pre-defined demographic, baseline and follow-up (FUP) clinical and cardiac functional parameter.

Results: Cell therapy was performed in 921 patients (57 ± 10 years, 86% male) ($n=489$ post-AMI and $n=432$ with ischemic cardiomyopathy, iCMP) while 474 patients (59 ± 7 years and 87% male) were randomized to controls, with an average FUP time of 7.2 ± 3.0 months. Compared with controls, cell therapy improved ($p < 0.001$) end-diastolic volume (EDV) (mean difference -6.1 ml; 95% confidence interval /CI/ -9.8 to 2.3 ml) and ejection fraction (EF) (mean difference 2.2%; 95% CI 1.3% to 3.1%). Kaplan-Meier analysis resulted in a trend towards better survival (97.9% vs 93.5%, $p=0.069$) and significantly (log rank $p < 0.001$) higher combined cardiac adverse event-free survival (freedom of AMI, death or target vessel revascularization) (87.2% vs 75.5%) rate in cell-treated patients vs controls. Lower baseline EF proved to be a significant predictor for improvement in cardiac function in all cell-treated patients regardless of cell delivery mode and main diagnosis. Presence of atherosclerotic risk factors, such as diabetes mellitus, hypertension, hypercholesterolemia or smoking or older age (factors responsible for malfunction of autologous cells) or male gender was not predictive for worse clinical outcome or EF in cell-treated patients. Subgroup analysis of patients with recent AMI or iCMP (baseline EDV of 142 ± 52 ml or 174 ± 61 ml, $p < 0.001$; EF of $43.4 \pm 10.8\%$ or $42.5 \pm 12.1\%$, $p = \text{non-significant}$) resulted in an improvement of EF of 4.2% (95% CI 1.2% to 3.1%, $p < 0.05$) or 3.90% (95% CI 1.96% to 5.84%, $p < 0.001$), respectively.

Conclusions: Meta-analysis of IPD of randomized and cohort trials reveals highly significant clinical benefit of cardiac cell treatment of patients with IHD in terms of event-free survival with moderate improvement of EDV and EF, suggesting reverse remodeling.