ACC.13
62nd Annual Scientific Session & Expo
TCT@ACC-i2

E1822
JACC March 12, 2013
Volume 61, Issue 10

INTRACORONARY CARDIOSPHERE-DERIVED CELLS (ICCDCS) PRODUCE MICROCIRCULATORY REMODELING BUT DO NOT INCREASE CORONARY FLOW RESERVE IN SWINE WITH HIBERNATING MYOCARDIUM

Poster Contributions
Poster Sessions, Expo North
Sunday, March 10, 2013, 3:45 p.m.-4:30 p.m.

Session Title: Cell Therapy and Angiogenesis
Abstract Category: 42. TCT@ACC-i2: Cell Therapy & Angiogenesis
Presentation Number: 2110-234

Authors: *Abdallah Kamouh, Brian Weil, Merced Leiker, John Canty, Gen Suzuki, University at Bufalo, Bufalo, NY, USA*

Background: Intracoronary CDCs increase myocyte proliferation and improve regional function in hibernating myocardium (HM) but their effects on the coronary microcirculation are unknown.

Methods: Accordingly, swine with collateral-dependent HM from a chronic LAD occlusion (n=12) were studied 4-months after instrumentation. We slowly infused a total of ~40x106 CDCs isolated from LV biopsies into each of the 3 major coronary arteries. Coronary flow (microspheres) was assessed at rest and after adenosine vasodilation and coronary flow reserve (CFR; vasodilated/resting flow) was compared to pathological indices of arteriolar (anti-alpha-smooth muscle actin) and capillary (anti vWF) microcirculatory remodeling.

Results: LAD wall thickening (%WT) in HM was decreased at rest (LAD %WT 26±4% vs. 70±7% in remote, p<0.05) and improved after icCDCs (LAD %WT 51±5% vs. 31±5% in untreated HM, p <0.05). While icCDCs increased capillary angiogenesis, they reduced the compensatory upregulation of arteriolar density in untreated HM (Table). As a result, there was no significant change in serial CFR (LAD 1.9±0.3 vs. 2.0±0.4 after icCDCs; Remote 4.9±0.3 vs. 5.4±0.4 after icCDCs, p-ns).

Conclusion: These data indicate that icCDCs stimulate capillary angiogenesis but normalize arteriolar density. Thus, the functional improvement resulting from icCDCs is associated with microcirculatory remodeling but independent of an increase in collateral perfusion.

Quantitative Histology of Coronary Microcirculation in Hibernating Myocardium

	LAD		Remote RCA	
	Untreated (n=6)	icCDCs (n=6)	Untreated (n=6)	icCDCs (n=6)
Capillary Density (number/mm^2)	1013 ± 31	1654 ± 27*	1038 ± 27	1545 ± 59*
Arteriolar Density (number/mm^2)	24.0 ± 3.7†	13.7 ± 2.2*	9.8 ± 1.7	8.9 ± 1.4

Mean ± SEM, *p <0.05 vs. untreated , †p <0.05 vs. remote.