Circulating Endothelial Progenitor Cells as a Marker of Coronary Atherosclerosis Severity in Patients with Symptomatic Chronic Heart Failure

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Background:
Recent evidence has defined that circulating endothelial progenitor cells (EPCs) might have a pivotal role in the presence of atherosclerosis, chronically diseased vessels or following acute vascular injury.

The aim of this study was to evaluate predict value of circulating EPCs in chronic heart failure patients with coronary artery disease (CAD).

Methods:
118 moderate-to-severe chronic heart failure (CHF) subjects (62 male, left ventricular ejection fraction = 42.68% [95 confidence interval (CI) = 35%-54%]) aged 46-68 years with angiographic documented stable CAD and 25 healthy volunteers were enrolled to the study. CAD severity was graded by calculating Gensini score index. Immunostaining and flow cytometric technique (FCT) were used for predicable distinguish cells subsets depended on expression of CD14, CD34, Tie-2, CD45, and VEGFR2. Mononuclear cells were cultured for functional analysis (CFUs) after FCT.

Results:
Analysis of obtained outcomes have been shown a significantly decreasing of the total CFU count and also circulating CD34+ subsets level: CD34+ CD45- VEGFR2+, and CD34+ CD45- Tei-2+ VEGFR2+ cells in CHF patients when compared with healthy volunteers. The relationship between Gensini score index and CD34+ CD45- Tei-2+ VEGFR2+ was determined by negative linear regression (R=-0.68; P=0.006). CD34+ CD45- Tei-2+ VEGFR2+ and CD34+ CD45- VEGFR2+were significantly higher in patients with first and second quartiles of Gensini score index when compared with those who have top quartiles of one (odds ratio (OR) = 5.32 [95% CI = 2.7-11.50]; P=0.008).

Conclusions:
A reduction in circulating EPCs defined as CD34+ CD45- VEGFR2+, and CD34+ CD45- Tei-2+ VEGFR2+ subsets cells in ischemic CHF patients. These findings can be taken into consideration as supporting of hypothesis about predict value of such cellular biomarkers with potential vascular repair capacity in evaluation of CAD severity inpatients with CHF.