Prošireni sažetak / Extended abstract

Relationship between level of circulating endothelial progenitor cells and severity of ischemic chronic heart failure with preserved left ventricular ejection fraction

Alexander Berezin*, Alexander Kremzer
State Medical University, Zaporozhye, Ukraine

Objectives: Traditional endothelial progenitor cells (EPC) populations, such as phenotypes CD34+VEGFR-2+ and CD34+VEGFR-2+CD133+ are not related to the extent of CAD or clinical outcome in patients with ischemic chronic heart failure. The concentrations of EPCs with phenotypes CD14+CD309+ and CD14+CD309+Tie2+ reflect the extent of vascular injury and risk of heart failure related outcomes in this patient population[1,2]. The aim of this study was to evaluate circulating endothelial progenitor cells (EPC) level phenotyped as CD45-CD34 +, CD14 + CD309 + and CD14 + CD309 + Tie2+ in patients with ischemic chronic heart failure with preserved left ventricular ejection fraction.

Patients and Methods: 126 patients (54 men) aged 48—62 years with angiographically proven coronary artery disease in the presence of stenotic lesions of at least one coronary artery >50%, and 25 healthy volunteers were included in the study. Ischemic chronic heart failure (CHF) was determined in 82 patients (65.0%) using traditional criteria in accordance with current clinical guideline. Phenotyping of mononuclear cells was performed by flowcytometry using monoclonal antibodies labeled with fluorochromes[3]. Circulating EPC were defined as CD45-CD34 +. In order to identify subpopulations of EPA co-expressing CD14 antigen is further defined antigens both CD309 (VEGFR2) and Tie-2 antigens.

Results: Circulating levels of proangiogenic mononuclear cells with the phenotype CD14 + CD309 + and CD14 + CD309 + Tie2 + is more dependent on the presence of chronic heart failure and the number of cardiovascular risk factors than on the severity and extent of coronary atherosclerosis in patients cohort with angiographically determined coronary artery disease. The most important independent predictors of lower circulating levels of EPC with the phenotype CD14 + CD309 + Tie2 + are CHF (OR = 1.45, 95% CI = 1.12-1.88; P = 0.004), type 2 diabetes (OR = 1.21, 95% CI = 1.10-1.40; P = 0.008), NT-pro-BNP> 154 fmol / mL (OR = 1.13, 95% CI = 1.04-1.18; P = 0.003), hyperlipidemia (OR = 1.12, 95% CI = 1.05-1.23; P = 0.005), as well as the presence of three or more traditional cardiovascular risk factors (OR = 1.31, 95% CI = 1.12-1.49; P = 0.008).

Conclusion: The negative impact of cardiovascular risk factors in respect of the manifestation of ischemic CHF may be mediated by non-hematopoietic deficiency of circulating EPC, whose mobilization from peripheral tissues is reduced in the early stages of myocardial dysfunction.

KEYWORDS: circulating endothelial progenitor cells, ischemic heart disease, chronic heart failure.

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*Address for correspondence: State Medical University, Mayakovsky av. 26, 69035 Zaporozhye, Ukraine.

Phone: +38.0612-729607

E-mail: dr_berezin@mail.ru

Literature

1. Vasa M, Fichtlscherer S, Aicher A, et al. Number and migratory activity of circulating endothelial progenitor cells inversely correlate with risk factors for coronary artery disease. Circ. Res. 2011; 89(1): E1-7.

2. Padfield GJ, Tura-Ceide O, Freyer E, et al. Endothelial progenitor cells, atheroma burden and clinical outcome in patients with coronary artery disease. Heart. 2013 Feb 6. [Epub ahead of print].

3. Liew A, Barry F, O'Brien T. Endothelial progenitor cells: diagnostic and therapeutic considerations. Bioessays. 2006;28(3):261-70.