

## 6<sup>th</sup> International Conference on **Clinical & Experimental Cardiology** November 30-December 02, 2015 San Antonio, USA

### **Circulating endothelial cell-derived micro-particles as a marker of clinical outcomes in chronic heart failure patients**

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**Background/Aim:** Chronic Heart Failure (CHF) remains a leading cause of cardiovascular morbidity and mortality. Although the endothelium is considered an important targeting for traditional risk factors and endothelial dysfunction remained independently associated with mortality from CHF, the innate molecular mechanisms affected forming of endothelial dysfunction is being became not fully clear. The study aim was to evaluate whether circulating micro particles with apoptotic or none-apoptotic phenotypes are useful for risk assessment of three-year cumulative fatal and non-fatal cardiovascular events in CHF patients.

**Methods:** It was studied prospectively the incidence of fatal and non-fatal cardiovascular events, as well as the frequency of occurrence of death from any cause in a cohort of 388 patients with CHF during 3 years of observation. Circulating levels of NT-pro Brain Batriuretic Peptide (NT-pro-BNP), high-sensitivity C-Reactive Protein (hs-CRP), Endothelial Apoptotic Micro Particles (EMPs) were measured at baseline.

**Results:** Median follow-up was of 2.32 years (IQR=1.8-3.1). During follow-up, 110 cardiovascular events (including 43 fatal cases) were determined. Additionally, 74 subjects were hospitalized repetitively due to worsening CHF and also 16 subjects were readmitted in the hospital due to other cardiovascular reasons. In the univariate logistic regression analysis, the main factors independently related with cumulative end-points were creatinine, fasting glucose, HbA1c, total cholesterol, uric acid various types of EPMs, NT-pro-BNP, hs-CRP, NYHA class, decreased left ventricular ejection fraction (LVEF) less 45%, and type 2 diabetes mellitus. In multivariate model NYHA class, decreased LVEF (less 45%), NT-pro-BNP, hs-CRP, CD144+/CD31+/annexin V+ EMPs, and CD31+/annexin V+ EMPs remained statistically significant for cumulative end-point. Adding of CD144+/CD31+/annexin V+ EMCs and CD31+/annexin V+ EMCs to the standard ABC model may improve the relative IDI for cumulative end-point by 11.4% and 10.5% respectively. These data are very promising, and they are required new investigation with higher statistical power and increased sample size to be overcome the internal limitations of the study.

**Conclusion:** Apoptotic phenotype of circulating micro particles may relate three-year combined clinical outcomes in CHF patients. Finally, identification of the pattern of circulating EMPs may help to determine patients at high risk and reclassify it for possible biomarker-guided therapy of CHF.

#### **Biography**

Alexander E. Berezin has received PhD in 1994 in the State Medical University of Zaporozhye (Ukraine). He is currently working as a Professor of Medicine in the State Medical University of Zaporozhye (Ukraine). His research goals are fundamental study of biological markers, the development of cardiovascular prevention and rehabilitation. Based on this research and training in heart failure he has received several awards and honors. He has published more than 550 papers in reputed journals, 19 books/chapters and has been serving as an editorial board member of repute.

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