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Immune Phenotypes of Endothelial-Derived Microparticles in Dysmetabolic Patients

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ABSTRACT

Type two diabetes mellitus remains a leading contributor to cardiovascular mortality worldwide. This study was conducted to investigate the pattern of circulating endothelial-derived microparticles in diabetes patients in comparison with metabolic syndrome subjects.The study retrospectively evolved 101 patients (54 subjects with type two diabetes mellitus and 47 patients with metabolic syndrome) and 35 healthy volunteers. All the patients have given written informed consent for participation in the study. Biomarkers were measured at baseline of the study. Type two diabetes mellitus (T2DM) remains to be increased metabolic disease achieved worldwide epidemic although quality assurance in care of pre diabetes states including metabolic syndrome (MetS) is continuously arised in the development countries Recent studies have emerged that genetic, early-life-depended, age-related, and sociodemographic factors, as well as dietary particularities, exiting comorbidities are discussed leading causes for current prevalence of T2DM in general population However, both clinical conditions T2DM and MetS are considered major risk factors that contribute in cardiovascular outcomes through interaction of similar pathogenesis' mechanisms Moreover, hyperglycemia, insulin resistance (IR), coagulation, activated immunity and cytokine production, oxidative stress that is suitable for T2DM and MetS may realize their effect on development of cardiovascular complication through inducing endothelial dysfunction There is evidence that systemic pro-inflammatory response induced by T2DM and MetS is cause of microvascular endothelial cell inflammation which affects cell-tocell cooperation, negatively effects tissue reparation, and may mediates by endothelial-derived microparticles and non-specific (shear stress) stimuli Circulating endothelial-derived microparticles (EMPs) depending on their origin (apoptotic-derived or activated endothelial cell production) are capable of transferring biological information (regulating peptides, hormones) or even genetic material (micro-RNA, mRNA, and DNA), as well as proteins, lipid components, from one cell to another without direct cell-to-cell contact to maintain cell homeostasis. Additionally, circulating EMPs derived from activated endothelial cells did not contain nuclear components and they have also been shown to have pro-angiogenic and cardio-protective properties. In opposite, apoptotic EMPs may originate from damaged endothelial cells that concentrate immune mediators, generating powerful signaling by the simultaneous receptor interaction and they are discussed a marker of endothelial cell injury and vascular aging The results of the study clarified that patients with T2DM and MetS may have different predominantly appeared phenotypes of circulating EMPs. As expected the Annexin V+ subset of EMPs should be significantly higher in T2DM patients when compared with MetS, but the results of the study did not confirm this assumption. In fact, annexin V binds to molecule.

Keywords: Diabetes mellitus; Metabolic

syndrome; Circulating endothelial-derived microparticles; Cardiovascular risk factors