Abstract: P6602

Plasma signature of apoptotic microparticles in acute coronary syndromes is associated with endothelial dysfunction and plaque rupture

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Background: Circulating microparticles (MP) are surrogate biomarkers of atherosclerosis and are elevated in acute coronary syndromes (ACS) but its exact biological role remains unknown.

Purpose: To explore the diagnostic and biological significance of circulating apoptotic MP signature in patients with ACS.

Methods: We enrolled 122 ACS patients: n=38 with unstable angina (UA), n=49 with STEMI, 35 with NSTEMI. Flow cytometry analysis was used to quantify circulating apoptotic (annexin+) endothelial cell (EMP), red blood cell (RMP) and platelet (PMP) derived microparticles. Endothelial function was estimated with flow mediated dilation (FMD), and inflammatory status with C-reactive protein (hsCRP).

Results: The association between EMP, RMP and PMP is shown on a cloud plot (A). Using an unbiased approach, we performed hierarchical clustering (A) of the total population of patients with ACS by using the circulating levels of EMP, RMP and PMP (B). Hierarchical clustering identified two discreet clusters of patients (Cluster A and B) without any differences in the presence of traditional risk factors (not shown), but significant differences in the distribution of ACS type (C). STEMI subtype (a surrogate for definite plaque rupture) was significantly increased in Cluster B, which also had significantly decreased FMD (D), but not hsCRP (p=NS).

Conclusions: Apoptotic MP are involved in the pathogenesis of acute coronary syndromes via promotion of endothelial dysfunction and plaque rupture. The diagnostic and/or predictive value of microparticles' profiling for plaque vulnerability should be explored in future studies.
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