Cell Free DNA as a Potential Marker in Acute ST-Elevation Myocardial Infarction

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Background: High levels of circulating cell free DNA, originating from apoptotic and necrotic cells , have been associated with poor prognosis in various malignant and inflammatory states. Data pertaining to cell free DNA in acute MI are scarce and the clinical significance of elevated levels in this situation is yet unknown. Moreover, the available data have been obtained by either slow electrophoresis or PCR, methods which are not practical for routine use. **Objective:** To evaluate a quick novel method for the detection of circulating cell free DNA in patients with ST elevation myocardial infarction (STEMI) and to examine their correlation with established markers such as troponin -T, CK and ejection fraction. **Methods:** The serum concentrations of cell free DNA, troponin-T and CK were measured simultaneously upon arrival from a Randomly selected STEMI patients admitted to the ICCU and at 3 more time points, 5-8 hours apart. Cell free DNA was quantified by a novel rapid fluorometric assay. Ejection fraction was assessed by echocardiography, blinded to lab results. **Results:** Specimens were taken from 16 patients aged 50.3±12.5 years (Figure 1: average serum levels vs. time). 14 patients had primary PCI. Peak DNA levels were found at 11.5±10.0 hours after admission and correlated with peak levels of CK and troponin -T (R=0.79, 95% CI 0.48-0.92); R =0.65, 95% CI 0.23-0.87, respectively). Levels of cell free DNA were higher during the first 6 hours after admission than later (147±69.9 ng/ml vs. 98.5±48.4 ng/ml P=0.01). Peak levels tended to correlate negatively with ejection fraction (R=-0.46 (95% CI -0.776 -- +0.051)/ P=0.075). **Conclusion**: With this rapid novel method, peak cell free DNA levels correlate significantly with the levels of established markers of myocardial necrosis but not with ejection fraction. The kinetic pattern of DNA release after STEMI and its prognostic value require further investigation.