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## IMBALANCE BETWEEN COAGULATION AND FIBRINOLYSIS SYSTEMS IS A RISK OF AN EXTENSIVE MYOCARDIAL INFARCTION

Y. Dudkina, O. Savchuk

Taras Shevchenko National University of Kyiv,  
Educational and Scientific Centre "Institute of Biology and Medicine",  
Ukraine

Changes in the system of hemostasis in case of acute myocardial infarction (AMI) are accompanied by significant activation of the blood coagulation system. This is evidenced by an increase in the content of the markers of thrombinemia: fibrinopeptides, soluble fibrin, fragments of prothrombin 1+2. The content of inhibitors of the blood coagulation system decreases and a thrombin-antithrombin complex (TAT) appears<sup>[1, 2]</sup>. The tissue plasminogen activator (t-PA), both bound and free, increases, but the level of t-PA activity remains low. Therefore, we were interested to look for biomarkers, which indicate a potential risk of myocardial infarction<sup>[3-5]</sup>. The aim was to study state of the hemostatic system in patients with angina pectoris, unstable angina and extensive myocardial infarction.

**Materials and Methods.** Coagulation parameters such as the levels of fibrinogen (Fg), soluble fibrin (SF), factor X, antithrombin III (AT III), protein C (PC), plasminogen (Pg), 2-antiplasmin (2-AP), tissue plasminogen activator (t-PA), thrombin time, ancistrionic time (reptilase time analogue) as well as activated partial thromboplastin time (APTT) were measured by coagulometer using corresponding commercial kits (Renam, Russia).

**Results.** In the group of patients with stable angina, the determined parameters were normal. In the group of patients with unstable angina deceleration of the blood clotting process in the APTT test (disbalance between activation of coagulation factors and inhibitors) was detected. Increase of

the level of fibrinogen, acceleration of clotting time in APTT tests and thrombin time (tendency to hypercoagulability), accumulation of thrombinemia marker - SF (0.015-0.12 g/l) was detected in cases with extensive myocardial infarction. Decrease in the level of PC both in patients with unstable angina and with extensive myocardial infarction (up to 60%) was observed. The activity of t-PA: control group - 2,062 0,653 (SD) iu/ml; stable angina - 1,792 0,78 (SD) iu/ml; unstable angina - 1,4 0,92 (SD) iu/ml, myocardial infarction - 1,16 0,14 (SD) iu/ml. Correlation was found between the levels of t-PA and SF (0,95,  $p < 0,05$ ), 2-AP (-0,37,  $p < 0,05$ ), Pg (0,37;  $p < 0,05$ ), Fg (0,75;  $p < 0,05$ ) in patients with extensive myocardial infarction.

Conclusion. The obtained results indicate that complex of tests which was used made it possible to detect accelerated activation of the blood coagulation system (internal pathway), accumulation of SF and lowering of AT III, PC, t-PA levels in case of extensive myocardial infarction. The detection of hypercoagulation and high levels of soluble fibrin with low t-PA activity can be an important prognostic indicator for the timely diagnosis.

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