Regulation of monocyte procoagulant activity in acute myocardial infarction: role of tissue factor and tissue factor pathway inhibitor-1

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In acute myocardial infarction (AMI), monocyte procoagulant activity is increased and may contribute to the risk for recurrence and other thrombotic events. This study sought to investigate the role tissue factor (TF) and tissue factor pathway inhibitor-1 (TFPI-1) in the regulation of monocyte procoagulant activity in AMI. Serial venous blood samples were obtained from 40 patients with AMI undergoing revascularization by stent placement. Twenty patients with elective stenting for stable angina served as control subjects. TF proteolytic activity was measured with spectrozyme factor Xa (FXa), TF and TFPI-1 surface expression on monocytes by flow cytometry, RNA expression in whole blood by reverse transcription-polymerase chain reaction, and concentrations of plasma prothrombin fragments F(1 + 2) by immunoassay. Forty-eight hours after AMI, an increase was found in TF RNA, followed by an increase in TF surface expression by 24% +/- 4% and in plasma concentration of F(1 + 2) by 103% +/- 17% (P <.05). These changes could not be attributed to the intervention because they did not occur in the control group. TFPI-1 RNA and binding to the monocyte surface remained unchanged. FXa generation by monocytes of patients with AMI increased 53.6% +/- 9% in the presence of polyclonal antibodies to TFPI-1, indicating that cell-associated TFPI-1 inhibits monocyte TF activity. The increased monocyte procoagulant activity in AMI was caused by an up-regulation of TF that was partially inhibited by surface-bound TFPI-1. Anticoagulant therapy by direct inhibition of TF activity may, thus, be particularly effective in AMI. (Blood. 2001;97:3721-3726)