Cell-Free mRNA Concentrations of Plasminogen Activator Inhibitor-1 and Tissue-Type Plasminogen Activator Are Increased in the Plasma of Pregnant Women with Preeclampsia

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Background: Detection of placental mRNA in maternal plasma has been reported in high-risk pregnancies. We attempted to investigate the concentrations of plasminogen activator inhibitor-1 (PAI-1) and tissue-type plasminogen activator (tPA) mRNA in maternal plasma in preeclampsia.
Methods: Peripheral blood samples were obtained from healthy pregnant women before and after delivery and also from women with or without preeclampsia. Plasma was isolated from these samples, and RNA was extracted. Plasma PAI-1 and tPA mRNA concentrations were then measured by use of reverse transcription PCR assays. The concentrations were converted into multiples of the median (MoM) of the controls adjusted for gestational age. Data were stratified and analyzed according to the clinical severity of preeclampsia and quantitative distribution of blood pressure and proteinuria.
Results: The median (minimum–maximum) PAI-1 mRNA MoM values for women with preeclampsia and controls were 2.48 (0.82–8.53) and 1.00 (0.41–2.33), respectively, whereas the median (minimum–maximum) tPA mRNA MoM values were 3.33 (1.01–10.58) and 1.00 (0.95–1.20), respectively. The concentrations of both PAI-1 and tPA mRNA were significantly increased in cases of preeclampsia, compared with controls (P <0.0001). The MoM values of both mRNA species were directly correlated with the severity of preeclampsia and were greatest among a subgroup of hemolysis, increased liver enzymes, and low platelets pregnancies.
Conclusion: Maternal plasma PAI-1 and tPA mRNAs are significantly increased in patients with preeclampsia and are positively correlated with the severity of preeclampsia.