PAPP-A in the first trimester of pregnancy as a predictor of preeclampsia

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Introduction: Preeclampsia (PE) is a major contributor of maternal and perinatal morbidity and mortality. Identification of high-risk factors, screening, and surveillance are of utmost importance in order to predict preeclampsia and initiation of preventive therapy. Serum concentration pregnancy associated plasma protein-A (PAPP-A) measurement might be useful in differentiating pregnancies that will have normal outcome from those which will not, and may reflect the pathophysiology of preeclampsia. Apart from chromosomal abnormalities, preeclampsia, intrauterine fetal demise, and pregnancy loss have been associated with maternal serum PAPP-A. For results below the first centile, PAPP-A has a strong positive predictive value for SGA and IUGR. Except for its vital role on the cleavage of insulin-like growth factor binding proteins (IGFBP), PAPP-A has proven to be a reliable marker for prenatal screening.

Aim of study: Aim of this study was to evaluate the association between the concentrations of maternal serum PAPP-A and the development of PE early in the first trimester.

Methods: The study was conducted as a prospective study, which included total of 60 pregnant women divided into two groups. In the study group (n=25) there were women with PE. The control group (n=35) were healthy pregnant women without complications in pregnancy. Blood samples were taken between 11. and 14. weeks of gestation, and the values of PAPP-A were determined in serum.

RESULTS: Values of serum concentration PAPP-A were significantly lower (t=2,792; p=0,007) in the PE group (0,80±0,32) than in CG group (1,22±0,69). There was significant, positive and moderate correlation between gestational age and PAPP-A level (R=0,451; p<0,001).
The cut off value with the best sensitivity and specificity ratio in the PE prediction is less than or equal to 0,328 where the sensitivity is 0,960 (96%), and the specificity is 0,086 (8,6%). In comparation to the control group, reduced PAPP-A was significantly lower (AUC=0.293; p=0.002) in the PE group

Conclusion: The results of this research indicate lower values of PAPP-A serum concentration could be one of the marker for prediction PE in the first trimester. Identifying women at risk of PE by maternal serum screening is conducive to prompt gestational management and thereby improve both maternal and perinatal outcomes. PAPP-A is a promising maternal serum marker for pregnancy outcome prediction with more studies needed in order for its potentials to be fully understood and exploited.

Keywords: PAPP-A, biomarkers, preeclampsia, hypertension in pregnancy, first trimester screening