

ABSTRACT

Hypertensive disorders are most important complications of pregnancy leading to maternal and fetal morbidity and mortality. Pre-eclampsia (PE) is a condition in which hypertension develops with proteinuria after 20 weeks of gestation. Those who develop hypertension without proteinuria are said to have pregnancy induced hypertension (PIH). Placental growth factor (PlGF), a member of vascular endothelial growth factors is produced predominantly by the placenta. PlGF has been suggested as one possible marker of endothelial dysfunction in PIH/PE.

50 women with PIH/PE and 45 women with uncomplicated normal pregnancies in the third trimester of pregnancy were involved in this study. A venous blood sample from each individual was drawn and the plasma PlGF levels were measured using commercially available ELISA kit. Results were analyzed using Mann-Whitney U test after stratification according to gestational age (<36 and \geq 37 weeks), infant birth weight (<2500g vs \geq 2500g) and presence or absence of urine albumin.

PlGF levels were significantly higher in the control sample than in the PIH/PE women in early third trimester [geometric mean, (95% CI): 544.7 (508.4, 799.3) vs 242.3 (234.0, 457.2) pg/ml respectively; $P=0.0016$]. PIH/PE women who had low birth weight infants had significantly lower PlGF levels compared to those with normal birth weight babies [geometric mean, (95% CI): 213.0 (193.4,380.9) vs 369.3 (319.4, 587.7) pg/ml respectively; $P=0.0146$]. Pre-eclamptic women had significantly lower PlGF levels compared to PIH women. [geometric mean, (95% CI): 180.2 (157.0, 332.1) vs 374.3 (355.5, 641.8) pg/ml respectively; $P=0.0016$].

In addition, two dimensional gel electrophoresis (2DE) technique was established to examine the placental proteome in pregnancy related complications. Pre-eclampsia and intrauterine growth restriction (IUGR) are complications of abnormal placentation. It is shown that IUGR placenta is not simply the smaller versions of a term placenta. 2DE is a valuable tool in proteomic research and still it is the best single technique for resolving proteins in a complex mixture.

Human term placentae from women with normal uncomplicated pregnancy ($n=2$), women with pregnancy induced hypertension ($n=1$) and women with IUGR pregnancy ($n=2$) were obtained during the caesarean section. The placental proteome was extracted using the extraction buffer and quantified by the Bradford test. 2DE was carried out using ATTO (Japan) Electrophoresis system using two different IEF gels (pH 3-10 & pH 5-8) and the polyacrylamide gel (5-20%).

This preliminary study shows that PlGF can be used as a marker for PIH/PE. Further studies are needed to determine PlGF levels in early gestational ages and protein profiling under different conditions.

Key words: Pre-eclampsia, Pregnancy induced hypertension, Intrauterine growth restriction, Placental growth factor, ELISA, Two dimensional gel electrophoresis