Soluble fms-like tyrosine kinase 1 and placental growth factor in the prediction of preeclampsia

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Objective
Preeclampsia (PE) is a major cause of maternal and perinatal morbidity. This condition is subdivided into early (before 34 weeks) and late (after 34 weeks) PE. We found to have too high false positivity using previously published cut-off values (85 and 110 for Roche Elecsys) in our setting. The objective of this case-control study is to investigate the potential value of maternal serum angiogenic factor ratio soluble Fms-kinase 1 (sFlt-1) / placental growth factor (PIGF) in the prediction of early and late PE in our institute.

Methods
Serum s-Flt-1 and PIGF and their ratio preeclamptic index (PEI) were measured in patients that developed PE before or after 34 weeks and unaffected controls. Preeclampsia was defined by blood pressure > 140/90mmHg and proteinuria > 300mg/24h. We analyzed s-Flt-1 and PIGF (Brahms Kryptor). PEI was calculated for patients before and after 34 weeks of pregnancy. We observed gestational age at delivery (GA), incidence of PE, HELLP syndrome, fetal growth restriction (FGR), small for gestational week (SGA), intrauterine fetal death (IUFD) and perinatal outcome. Statistical analysis was performed using IBM SPSS Statistics 24.

Results
Our study included 339 patients. Average maternal age was 32.9, average BMI 24.9, 43% were primigravidas and 56% were nulliparous. Patients with subsequent adverse outcome (n=87) had significantly higher sFlt-1, lower PIGF and higher PEI ratio than women without adverse outcome (n=252), p<0.001. PEI ratio correlated with prematurity. GA was significantly lower in the PE group: 34.7 vs. 39.5 weeks, p<0.001. We calculated a cut-off for PEI ratio (>300) with good sensitivity and specificity for prediction of early PE. This cut-off shows good precision value (AUC 0.86) for measurements by Brahms Kryptor.

Conclusion
Our study shows, that previously published PEI cut-off levels did not improve preeclampsia detection when measuring sFlt-1/PIGF ratio with Brahms Kryptor in our setting. We propose a cut-off (PEI > 300) that shows high diagnostic accuracy for early PE. Further analysis is needed.