**Title:** Early Detection of Preeclampsia

**Summary:**

Preeclampsia (PE), a pregnancy-related placental vascular disorder affecting 5-8% of all pregnancies, is thought to be a multisystem disorder of pregnancy driven by alterations in placental function and resolved by the delivery of the placenta and fetus. Untreated PE can cause serious health problems for both mothers and babies. Early detection of risk of developing PE remains a challenge in clinical settings. The ratio of soluble fms-like tyrosine kinase (sFlt-1) and placental growth factor (PIGF) levels has been proposed as a useful index to diagnose and manage PE. However, the ratio only works at mid or late gestation. Previous transcriptomic and proteomic profiling of normal and complicated pregnancies have identified disease-specific expression patterns and signaling networks, which suggests candidate biomarkers for possible early clinical assessment. We hypothesized that there are maternal serological biomarkers differentiating impending PE from normal pregnancy at early stage of gestation. We quantified proteins and lipids in maternal serum by ELISA and LC MS/MS methods, and evaluated the performance of these candidate markers in predicting PE on an age-matched discovery cohort (32 PE subjects and 32 controls) and a longitudinal testing cohort (20 PE subjects and 20 controls). Results showed that a ratio of an elevated marker and a decreased marker differentiated women with impending PE from normal pregnant women at 1st and early 2nd trimesters, which is earlier than the well-established biomarkers (sFlt-1 and PIGF). Our finding may offer a new investigational approach towards the understanding of biology during pregnancy as well as guiding innovative methods for PE assessment.

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