

Titel	Gene and Protein Profiling of the Preeclamptic Placenta
Författare	Magnus Centlow , ingen e-mail
Avdelning/ar	Department of Obstetrics and Gynaecology (Lund)
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Aims State-of-the-art methodology was used to screen and profile the placenta, gene and protein expression, for changes related to preeclampsia (PE) and cases with increased resistance in the uterine arteries. Women with increased resistance in the uterine arteries have increased risk of developing PE. Since not all of them develop PE, this group, identified by Doppler ultrasound, was included to search for genes and/or proteins that may protect them from developing PE. Results The PE placenta showed increased gene expression of fetal hemoglobin (Hb). Protein expression analysis confirmed the accumulation of free Hb, particularly the gamma chain was detected in the vascular lumen. Patients with increased resistance in the uterine arteries, expressed as a notch in blood velocity tracings recorded with Doppler ultrasound. Notching without PE, showed increased expression of genes related to apoptosis and antigen presentation in their placentas. In the notch placentas that later developed PE, an increased expression of genes related to inflammatory cell movement was seen. Antibody microarray screening of maternal plasma showed that late and early onset PE as well as PE with notching and IUGR showed different inflammatory responses. Conclusions The changes in gene expression suggested that PE may be a three-stage disease with notch as a reversible middle stage. Accumulation of inflammatory cells in the notch placenta may cause inflammation that drives the pathophysiology into PE. Increased expression of antigen presenting genes may protect the notch placenta from pro-inflammatory damage thereby preventing progression into PE. Free fetal Hb was identified as a possible placental factor that further induces inflammation and tissue damage. Increased maternal plasma levels of free fetal Hb may be used as a prognostic and diagnostic marker for PE. The maternal immune reaction and inflammatory response may be important factors that further determine the severity and the clinical manifestations of PE.