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# Human Genetics 2016: Epigenetic changes induced by pregnancy complications may initiate latter development of cardiovascular and cerebrovascular diseases in the mother - Ilona Hromadnikova - Charles University, Czech Republic

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**Aim:** To demonstrate that pregnancy complications are associated with alterations in cardiovascular and cerebrovascular microRNA expression in maternal circulation. We focused on microRNAs playing a role in pathogenesis of dyslipidemia, hypertension, vascular inflammation, insulin resistance and diabetes, atherosclerosis, angiogenesis, coronary artery disease, myocardial infarction and heart failure. Methods: Gene expression of 29 microRNAs was compared between groups (39 GH, 68 PE, 33 IUGR and 20 normal pregnancies) and correlated with the severity of the disease with respect to clinical signs, delivery date and Doppler US parameters.

**Results:** The down-regulation of miR-100-5p, miR-125b-5p and miR-199a-5p was a common phenomenon shared between GH, PE and IUGR. IUGR induced down-regulation of miR-17-5p, miR-146a-5p, miR-221-3p and miR-574-3p. Irrespective of the severity of the disease, PE was associated with the dysregulation of miR-100-5p and miR-125b-5p and IUGR with dysregulation of miR-199a-5p. PE terminated before 34 weeks was associated with down-regulation of miR-146a-5p, miR-199a-5p and miR-221-3p. Weak negative correlation between miR-146a-5p and miR-221-3p expression and the PI in umbilical artery was found. Additional microRNAs (miR-103a-3p, miR-126-3p, miR-195-5p and miR-499a-5p) showed a trend to downregulation.

**Conclusion:** MicroRNAs playing a role in pathogenesis of dyslipidemia (miR-146a-5p), vascular inflammation (miR-126-3p, miR-146a-5p, miR-195-5p, miR-221-3p), insulin resistance and diabetes (miR-126-3p), atherosclerosis (miR-126-3p), angiogenesis (miR-17-5p, miR-100-5p, miR-221-3p), coronary artery disease (miR-17-5p, miR-126-3p, miR-195-5p, miR-221-3p), myocardial infarction and heart failure (miR-17-5p, miR-100-5p, miR-103-3p, miR-125b-5p, miR-195-5p, miR-199a- 5p, miR-499a-5p, miR-574-3p) were also dysregulated in maternal whole peripheral blood during the onset of pregnancy complications such as gestational hypertension, preeclampsia or IUGR.

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