

## **Abstract**

Children descending from pregnancy complicated by gestational hypertension, preeclampsia or fetal growth restriction have a lifelong increased risk of development of cardiovascular disease. This study investigates the expression profile of 29 cardiovascular and cerebrovascular microRNAs in children at the age of 3 to 11 years.

MicroRNAs are short non-coding RNA molecules affecting gene expression by posttranscriptional modifications of mRNA, which affects biological processes. Abnormal microRNA levels can lead to pathological conditions of the individual. This study explores the relationship between dysregulated microRNA levels in whole peripheral venous blood of children and the presence of complications during pregnancy. Furthermore, this study looks at expression profile specificities depending on the presence of pathology in the child's cardiovascular system, as found in a clinical examination consisting of BMI assessment and evaluation, blood pressure testing and ultrasound examination of the heart.

Dysregulated profile was present in children with gestational hypertension in miR-1-3p, miR-17-5p, miR-20a-5p, miR-21-5p, miR-26a-5p, miR-29a-3p, miR-126-3p, miR-133a-3p, miR-181a-5p, miR-199a-5p, miR-342-3p and miR-499-5p. In children with preeclampsia, dysregulation was found with miR-1-3p and miR-103a-3p. Infants affected by fetal growth restriction had abnormal levels of miR-17-5p, miR-21-5p and miR-126-3p.

Long-lasting dysregulation carries an increased risk of development of cardiovascular or cerebrovascular disease. The implementation of a microRNA expression profile screening has the potential to detect high-risk children and could reduce the likelihood of developing disease by introducing primary prevention.

## **Keywords**

miRNA, cardiovascular diseases, pregnancy-related complications, gestational hypertension, preeclampsia, fetal growth restriction