

Abstract

The aim of this study was to investigate gene expression of cardiovascular miRNAs in peripheral blood of mothers after delivery. MiRNAs are small non-coding RNAs, which significantly modulate posttranscriptional adjustments of mRNA and thus regulate gene expression across biological processes. Dysregulation of miRNAs is associated with many pathological phenomena, thanks that we can use them for diagnosis and potentially we can treat these diseases by the manipulation of miRNA gene expression.

We examined gene expression of circulating miRNAs associated with cardiovascular diseases, and we investigated, how the expression profile depends on pregnancy course and manifestation of pregnancy-related complications. For this purpose we examined material from 221 mothers 3-10 years after delivery. A group with identical pregnancy-related complication was always compared with a group of mothers after physiological pregnancy. Gene expression of 29 cardiovascular miRNAs in peripheral blood was studied using reverse transcription and quantitative real-time PCR.

It was confirmed, that the expression profile of miRNAs differed between pregnancy-related complications and physiological controls. We also confirmed, that the profile of gene expression discovered at mothers 3-10 years after delivery was different from that found in pregnant women with the same diagnosis. As the expression profile is changing, the risk of the development of cardiovascular disease also changes after the delivery. Therefore, pregnancy related complications, due to dysregulation of miRNA profile, highly affect mothers cardiovascular system even years after delivery.

The experimental data we have acquired have enormous potential for future diagnostic and prognostic utilization. MiRNAs may become a modern diagnostic markers of cardiovascular diseases. For mothers after pregnancy-related complications the information concerning the cardiovascular state based on miRNA expression profile can be very valuable. This could reveal, how pregnancy course influences mothers cardiovascular system, and how high is their own risk of later development of cardiovascular diseases.

Key words:

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