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# The microRNA cluster including miRNA16, miRNA27 and miRNA103 represents an early peripheral biomarker of fetal growth restriction

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**Abstract**

Objective: Current tests available to diagnose fetal hypoxia in-utero lack sensitivity thus un-diagnosing many fetuses at risk. microRNAs derived from the placenta circulate in the maternal blood during pregnancy and may be used as biomarkers for pregnancy complications. To identify putative markers of fetal growth restriction (FGR) and new therapeutic druggable targets, we examined, in maternal blood samples, the expression of a cluster of microRNAs, known to be regulated by hypoxia. Population: Pregnant Caucasian women between 18 and 46 years old hospitalized. Design and Setting: To discriminate between early- and late-onset FGR, the study population was divided into two subgroups according to the gestational age at delivery, group (1) : <32th weeks of gestation; and group (2) from 32th to 37th weeks of gestation. Methods: Ultrasound biometry, Doppler velocimetry, RT-PC-R, Software miRNA-targets predictors Results: Among the microRNA cluster examined, three microRNAs: miR-16-5p, miR-103-3p, and miR-27b-3p were upregulated in FGR blood samples before the 32th week of gestation. Notably, the expression of all miRNAs was increased through gestation in healthy control group, whereas, in the FGR groups, where there was a progressive reduction in the expression of miR-103-3p and miR-107-3p and a slight reduction for miR-16-5p. Main Outcome Measures: miRNA expression Conclusions: Our results showed that measurement of miRNAs in maternal blood may form the basis for a future diagnostic test to determine the degree of fetal hypoxia in FGR, thus allowing the start of appropriate therapeutic.

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