19th World Congress in Fetal Medicine

Circulating micro RNA as biomarkers of preeklampsia

Kondracka A, Jaszczuk I, Koczkodaj D, Kondracki B, Stupak A, Filip A, Kwaśniewska A
Department of Obstetrics and Pathology of Pregnancy, Lublin, Poland

Objective

The aim of the study is to ascertain the effectiveness of following prognostic preeclampsia development factors during the first trimester of the pregnancy in the Polish population. The approach being accessed is the utilization of estimations of microRNA profiles in the serum of pregnant women. .

Methods

The study group will be chosen from patients of the Department of Obstetrics and Pathology of Pregnancy, Medical University of Lublin. Peripheral blood samples from 80 pregnant women and 20 healthy non-pregnant female volunteers will be examined. Pregnant women blood samples will be collected in the first trimester (12 weeks of gestation). Blood serum microRNA profiles rating will be carried out by using real-time quantitative polymerase chain reaction (RQ-PCR) based on dedicated, commercially available kits.

Results

The presence of specific placenta-related circulating microRNAs fraction in the serum of pregnant women with pre-eclampsia symptoms after 20 weeks of gestation and also significant microRNAs level changes can play an important role in the development of placenta-related complications. Research concentrating on microRNAs levels in the blood serum of pregnant women with pre-eclampsia will enable us to create a practical way of utilizing selected microRNAs at the earliest possible stage as a safe biomarker of severe complications of pregnancy. .

Conclusion

Preeclampsia is a condition clinically diagnosed only during the second half of pregnancy, but processes that lead to its development start at the stage of blastocysts nesting in uterine. Defective placentation leads to preeclampsia symptoms. Preeclampsia symptoms mainly consist of abnormal blood perfusion in the uterus and placenta and also the clinical effects of ischemia. Placental development during each pregnancy is associated with intensive placental remodeling caused mainly by cell proliferation, angiogenesis and simultaneous apoptosis. Current strategies for pre-eclampsia prediction consist of assessments of combinations of maternal risk factors, ultrasound parameters and different biomarkers (proteins, circulating cell free DNA and microRNAs). Studies of microRNAs are very promising because they carry great diagnostic potential and lead to new kinds of therapy in pregnancy-related disorders. The fraction of specific placenta-derived circulating microRNAs can be analyzed in whole blood and also in the blood serum of pregnant women. Pregnant woman microRNAs serum profiling gives the opportunity to examine the correlation and microRNAs level changes associated with the gestational complications development. MicroRNAs profiles changes and microRNAs levels deviations are observed in every trimester of pregnancy. MicroRNAs associated with the presence of trophoblast are detected in serum during the pregnancy and are not present in the serum after parturition. This is the main reason of statistic differences in levels of serum microRNAs expression in pregnant women with preeclampsia and pregnant women with healthy pregnancy. It allows specific, selected microRNAs to become a safe and accurate clinical biomarkers of severe pregnancy complications. Wide knowledge of molecular specific microRNAs targets will also allow understanding their role in preeclampsia. This can protect pregnant women and can lead to development of new effective therapeutic methods to mitigate preeclampsia. The conducted studies lead to elaborate an effective and noninvasive method for diagnosing at an early stage of the pregnancy.