Actual gynecology and obstetrics

AGP

www.actualgyn.com

ORIGINAL ARTICLE

First trimester screening of circulating C19MC microRNAs can predict subsequent onset of gestational hypertension

Prvotrimestrální screening cirkulujících C19MC mikroRNA predikuje pozdější výskyt gestační hypertenze

Ilona Hromadnikova[1], Katerina Kotlabova[1], Lucie Hympanova[1,2], Jindrich Doucha[3], Ladislav Krofta[2]

[1]Department of Molecular Biology and Cell Pathology, Third Faculty of Medicine, Charles University in Prague, Czech Republic
[2]Institute for the Care of the Mother and Child, Third Faculty of Medicine, Charles University in Prague, Czech Republic
[3]Clinic of Obstetrics and Gynecology, Second Faculty of Medicine, University in Prague, Czech Republic

Correspondence: prof. RNDr. Ilona Hromadníková, PhD., Oddělení molekulární biologie a patologie buňky, 3. lékařská fakulta Univerzity Karlovy, Ruská 87, 100 00 Praha 10, tel.: +420 267 102 170, e-mail: ilona.hromadnikova@lf3.cuni.cz

Published: 13. 1. 2015 Received: 3. 1. 2015 Accepted: 5. 1. 2015
Actual Gyn 2015, 7, 1 ISSN 1803-9588

Free fulltext article at www.actualgyn.com

Cite as: Hromadnikova I, Kotlabova K, Hympanova L, Doucha J, Krofta L. First trimester screening of circulating C19MC microRNAs can predict subsequent onset of gestational hypertension. Actual Gyn. 2015;7:1

Objective: The objective of the study was to evaluate risk assessment for gestational hypertension based on the profile of circulating placental specific C19MC microRNAs in early pregnancy.

Study design: The prospective longitudinal cohort study of women enrolled at first trimester screening at 10 to 13 weeks was carried out (n=267). Relative quantification of placental specific C19MC microRNAs (miR-516-5p, miR-517*, miR-518b, miR-520a*, miR-520h, miR-525 and miR-526a) was determined in 28 normal pregnancies and 18 pregnancies which developed gestational hypertension using real-time PCR and a comparative Ct method relative to synthetic C. elegans microRNA (cel-miR-39).

Results: Increased extracellular C19MC microRNA plasmatic levels (miR-516-5p, p< 0.001; miR-517*, p= 0.007; miR-520h, p< 0.001; miR-518b, p= 0.002) were detected in patients destined to develop gestational hypertension. MiR-520h had the best predictive performance with a PPV of 84.6% at a 7.1% false positive rate. The combination of miR-520h and miR-518b was able to predict 82.6% of women at the same false positive rate. The overall predictive capacity of single miR-518b (73.3% at 14.3% FPR), miR-516-5p (70.6% at 17.9% FPR) and miR-517* (57.9% at 28.6% FPR) biomarkers was lower.

Conclusion: The study brought interesting finding that the up-regulation of miR-516-5p, miR-517*, miR-520h and miR-518b is associated with a risk of later development of gestational hypertension. First trimester screening of extracellular miR-520h alone or in combination with miR-518b identified a significant proportion of women with subsequent gestational hypertension.

Literature

Hromadnikova I, Kotlabova K, Hympanova L, Doucha J, Krofta L. First Trimester Screening of Circulating C19MC microRNAs Can Predict Subsequent Onset of Gestational Hypertension. PLoS One. 2014 Dec 15;9(12):e113735. doi: 10.1371/journal.pone.0113735. eCollection 2014.

The work was exclusively supported by the Grant Agency of Czech Republic (no. 304/12/1352) and partially supported by the Charles University research program PRVOUK P32.