

## HIGH ACTIVITY OF MMP-2 AND MMP-9 IN TROPHOBLAST TISSUE DURING SPONTANEOUS ABORTION

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**Objective:** Extracellular matrix degrading enzymes – matrix metalloproteinases are responsible for many aspects of tissue remodelling. Both matrix metalloproteinase type 2 (MMP-2) and matrix metalloproteinase type 9 (MMP-9) are involved in human implantation and placentation. These enzymes play a crucial role in some pathological processes occurring in the early pregnancy. Low activity of MMP-2 and MMP-9 during trophoblast invasion could lead to the development of preeclampsia. Also the process of spontaneous abortion may be mediated by increased activity of MMP-2 and MMP-9.

The aim of the study was the estimation of activity of MMP-2 and MMP-9 in human trophoblast during spontaneous abortion.

**Methods:** Three specimens of trophoblast from spontaneous abortion at 7<sup>th</sup> to 9<sup>th</sup> week of pregnancy were obtained. Another 3 specimens of trophoblast were taken after therapeutic abortion at 7<sup>th</sup> to 8<sup>th</sup> week of pregnancy. Tissues were pulverised, homogenised in buffer containing 10 mM CaCl<sub>2</sub> and 0,25% Triton X-100 and centrifuged at 6000 x g. The supernatants (Triton extracts) were stored at 4° C until further examination. The pellets were resuspended in 50 mM Tris buffer containing 100 mM CaCl<sub>2</sub>, 150 mM NaCl and incubated for 6 minutes at 60° C. The samples were centrifuged at 20000 x g and dialysed. The activities of MMP-2 and MMP-9 were estimated by the means of substrate zymography and quantitated by the integrated computing densitometer system (One.Descan). Statistical analysis was done using Student's t-test.

**Results:** The activities of MMP-2 and MMP-9 in Triton extracts were negligible except one case of spontaneous abortion. The estimation of MMP-9 activities in heat extracts revealed statistically significant difference between cases of spontaneous abortion and therapeutic abortion ( $9,98 \pm 7,16$  OD vs.  $0,77 \pm 1,18$  OD,  $p=0,01$ ). Also the activities of MMP-2 were higher, although not significantly, in spontaneous abortion group ( $3,46 \pm 3,52$  OD vs.  $0,69 \pm 0,92$  OD,  $p=0,09$ ).

**Conclusion:** MMP-2 and MMP-9 could play important role in the pathophysiology of spontaneous abortion.

## USE OF MATHEMATICAL TECHNIQUES FOR PROGNOSIS OF LARGE FETUS WEIGHT IN THE THIRD TRIMESTER OF PREGNANCY

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**Aim:** prognosis of intrauterine fetus weight in case of macrosomia in the third trimester of pregnancy in order to optimize date and method of birth.

**Methods:** ultrasonography of fetus in the third trimester of pregnancy with biparietal diameter (BD), femur length (FL), abdominal circumference (AC), transverse heart diameter at the level of four chambers (THD) measurements. Ultrasonography was performed with the use of linear array transducer 3,5 MHz from Aloka-650 and convex transducer 5 MHz. The results were processed using statistics analysis methods with the help of ECM. Construction of prognosis model was performed by linear multiple regressing analysis. Applied programmes «Statgraphics» were used for calculation. Transverse heart diameter 40 mm and greater is the diagnostic criteria of large fetus ( $p<0,001$ ).

**Results:** with the help of regressing analysis the decisive rule of prognosis was created, making possible the evaluation of large fetus weight according to the following formula:

$A = K1 \cdot BPD + K2 \cdot FL + K3 \cdot AC$  where A-biophysical criteria of large fetus prognosis in gr.;

BPD - biparietal diameter of head in mm ( $p<0,01$ ),

FL - femur length in mm ( $p<0,05$ ),

AC - abdominal circumference ( $p<0,05$ ),

K1, K2, K3 - coefficients.

**Conclusion:** decisive rule of prognosis permit to determine intrauterine fetus weight in macrosomia with high degree of reliability ( $R=0,98$ ). Choosing of optimal date and method of birth decreases risk of trauma for mother and newborn.