

Can maternal hormones play significant role in childbirth mode? A prospective study.

Dr Christina Pappa¹, Dr Fani Gkrozou², Mr Evangelos Dimitriou³, Dr Orestis Tsonis⁴, Miss Aikaterini Kitsouli⁵, Dr Dimitrios Varvarousis⁶, Dr Vasileios Xydis⁷, Dr Minas Paschopoulos⁸, Dr Panagiotis Kitsoulis^{5,9}

¹Oxford University Hospitals, NHS Foundation Trust, Oxford, United Kingdom. ²University Hospitals of Birmingham, NHS Foundation Trust, Birmingham, United Kingdom. ³National and Kapodistrian University of Athens, Athens, Greece. ⁴St. Bartholomew's Hospital, Barts Health NHS, City of London, United Kingdom. ⁵Anatomy-Histology-Embryology, University Hospital of Ioannina, Ioannina, Greece. ⁶Orthopedic Surgeon, Medical School, University of Ioannina, Ioannina, Greece. ⁷Department of Radiology, University Hospital of Ioannina, Ioannina, Greece. ⁸Department of Obstetrics and Gynaecology, University Hospital of Ioannina, Ioannina, Greece. ⁹Orthopedic Surgeon, Medical School, University of Ioannina, Ioannina, Greece

Objective

Mode of childbirth can be affected by different aspects, like maternal pelvic anatomy, fetal growth and hormonal status at the time of delivery. Aim of our study was to evaluate maternal pelvis dimensions, specific traits and changes during pregnancy and childbirth, in correlation with fetal size and the hormonal profile of primigravidae women.

Design

Our study included 448 nulliparous women who had clinical assessment and blood tests in 3 different stages: at first trimester between 10 and 12 weeks, at the time of admission, before childbirth and just before delivery. Each examination included clinical internal pelvimetry and ultrasonographic measurements of specific variables of the pubic symphysis and the fetus. At the end of the examination 10ml of blood were collected for defining progesterone, estradiol and relaxin levels in peripheral maternal circulation.

Methods

Women with a preterm labour before 37 weeks of gestation, non-singleton pregnancies, previous childbirth after 24 weeks of gestation, second semester miscarriage or termination of pregnancy due to fetal anomalies were excluded. Women that failed to attend for the evaluation at all three stages or had an elective caesarean section (C/S) have been excluded too. The final study population was composed of 304 nulliparous women separated in three different groups: women with normal delivery, operative vaginal delivery and caesarean section after failure to progress (FTP). Blood samples were centrifuged for 15 minutes at 2000g at 4°C and the serum was stored until assay. For the statistical analysis, IBM SPSS Statistics 23 has been used. The correlation between variables was tested using the Linear Regression Model.

Results

According to our results, there is statistically significant difference at the mean of progesterone, estradiol and relaxin range during different ways of delivery (p-value<0.01). We also found that there is statistically significant correlation between the newborn's body weight and the changes in pubic symphysis dimensions.

Conclusions

We could identify that there is a various range in maternal hormonal profile during different ways of childbirth. Several changes have been observed in the bony pelvis and soft tissues but none of them has revealed a clear correlation with hormonal changes. On the contrary, fetal size seems to be the most important factor causing alterations in maternal pelvis during parturition. Our data combined with data supporting predictive factors of successful vaginal delivery can be used to form the basis of well-informed computerized systems which will be supportive to clinical decision.

