

## ABSTRACT

Maternal smoking causes serious health danger for a mother but especially for a baby. Cigarette smoking produces complex steroidogenesis changes during the whole life of a woman. To study the influence of smoking on fetoplacental unit focusing on steroid hormones it was important first to concentrate on changes of the chosen steroids around the delivery.

The first part of the thesis is dedicated to observe some chosen steroid hormones in peripartal period (37th week of the pregnancy, first stage of labor of mothers and mixed umbilical blood of their neonates) and to look for relations to the age of mother, the increase of the weight during the pregnancy, the type of the delivery and the sex of the baby.

It was interesting to compare steroids in the relation to the type of the delivery: vaginal delivery versus planned caesarean section. Non-smoking women who delivered a boy spontaneously had significantly higher level of 17-OH-pregnenolone, progesterone, cortisol, corticosterone and significantly lower level of estradiol in comparison with non-smoking women who delivered a boy by a planned Caesarean section. In the maternal blood in the 37th week of the pregnancy there were found differences between steroids in accordance to the sex of the fetus but they were not found in the neonates' case. The age of mother, the increase of the human weight and the birth weight of the neonate didn't have any relation to any of the observed steroids. There were created reference ranges for observed steroids measured by LC-MS/MS.

In the second part my thesis was monitoring changes of the creation of steroid hormones of smoking mothers. This part was focused on changes of steroidogenesis in blood of mothers in the 37th week of their pregnancy and in mixed umbilical blood of their neonates.

In the group of women who were expecting a boy there were smoking women in the 37th week who had higher serum levels of cortisone, DHEA, 7 $\alpha$ -OH-DHEA, 17-OH-pregnenolone, testosterone and androstenedione in comparison with non-smoking women. In the group of women who were expecting a girl there were smoking women in the 37th week who had lower serum levels of 7 $\beta$ -OH-DHEA and higher levels of androstenedione. There were detected higher levels of testosterone at the boys of smoking mothers. But at the girls of smoking mothers there were detected lower levels of 7 $\alpha$ -OH-DHEA. Smoking during pregnancy causes changes in the creation of steroids not only in the case of pregnant women but also in the case of their children.

The results shown in this thesis can help to understand better physiological changes of steroid hormones in peripartal period and to clarify impacts of smoking in pregnancy on possible pathophysiological changes in overall setting of steroid axis.