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Placental CYP24A1 gene expression and vitamin D saturation in preeclampsia

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Introduction

Vitamin D deficiency and insufficiency is widely spread among pregnant and breastfeeding women. It increases rates of infertility, miscarriage, preeclampsia, hypertension during pregnancy, preterm delivery, GDM, caesarian section, bacterial vaginosis and low-weight at birth.

Aim

To determine gene CYP24A1 expression in placental tissue in women with different vitamin D saturation during physiological pregnancy and preeclampsia

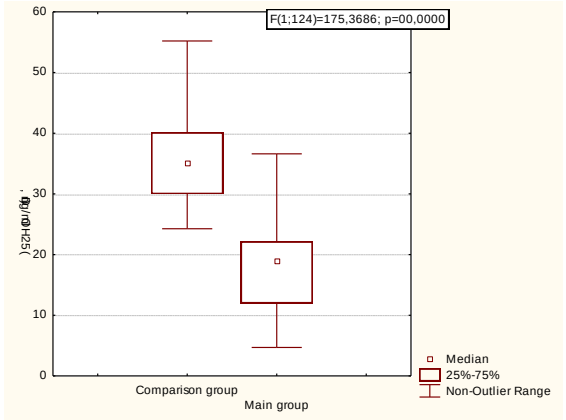
Methods& Materials

Cohort retrospective and prospective study. We examined 126 pregnant women in Saint Petersburg. Mean gestational term was 30±0,52 weeks. From 12 weeks all pregnant women took 400 IU of vitamin D. Serum 25-OH D level was measured by ELISA on the analyzer «Cobas E411» Roche. mRNA expression of CYP24A1 gene was measured in placental sample by qRT-PCR.

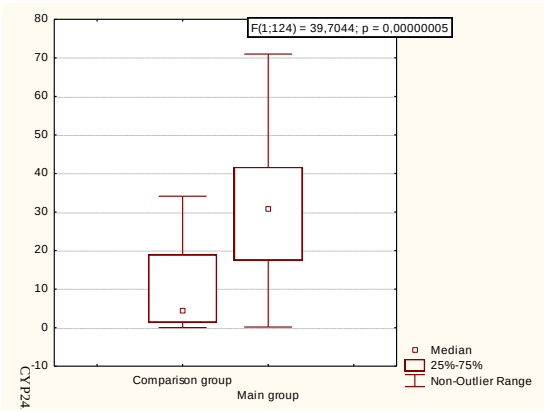
Results

2 groups were analyzed. In main group vitamin D deficiency was found in 60,95% , in group of comparison-not found. In main group vitamin D insufficiency was found in 31,25%, in group of comparison- in 29%. In main group normal level of vitamin D was found in 7,8% , in group of comparison- in 71%. Differences were significant (p<0,0001). Mean serum level of 25-OH D in physiological pregnancy was 36,65±3,1 ng /ml, in preeclampsia group-17,98 ±4,1 ng/ml (p<0,0001). Statistically significant increase of relative mRNA expression of CYP24A1 gene in placental tissue was found in preeclampsia group compared to physiological pregnancy (p=0,03). Negative correlation was found between serum 25-OH level and CYP24A1 gene expression in placental tissue (r=-0,75; p<0,05).

The joint distribution chart 25-hydroxycholesterol in the serum in the studied groups



Expression differences of the gene CYP24A1 mRNA in the studied groups



Conclusions

This study showed that vitamin D deficiency and insufficiency and the increase of placental CYP24A1 gene expression are risk factors for preeclampsia development .