Correlation between biochemical parameters of the bone metabolism and vitamin D level during pregnancy.
E. Shelepova, I. Zazerskaya

Vitamin D deficiency affects the rate of bone metabolism. Increasing the speed of bone resorption can lead to osteopenia and osteoporosis and fractures in the postpartum period. Deficiency and deficit of the vitamin D are a common problem in the world. However, at the present time there is no research which is dedicated to studies about the saturation of vitamin D of pregnant women in Russia. The purpose of this study is to assess biochemical parameters of bone metabolism, and vitamin D levels of the pregnant women in the III trimester. The group included 46 pregnant women at 37-41 weeks of gestation period, living in St. Petersburg and Leningrad region. The study was conducted on the basis of Almazov Federal Heart, Blood and Endocrinology Centre. All pregnant women receive multivitamin complex containing 400 IU of vitamin D. Calcium Entry Level assessed by developed questionnaire. Evaluated: the level of 25-(OH) D in serum, osteocalcin and ß- isomer of the C-terminal telopeptide of collagen type I (CTX) by chemiluminescence immunoassay analyzer Architect2000 and Roche Cobas E411 base on Central Clinic-diagnostic laboratory of The Almazov Federal Heart, Blood and Endocrinology Centre.

Results: the normal levels of vitamin D - 7 pregnant women (15.23 %), deficiency of vitamin D - 15 pregnant women (32.60 %), vitamin D deficit - 24 pregnant women (52.17 %). Average values of vitamin D in serum are 37.24 ± 0.3 ng/ml, 23.69 ± 0.3 ng/ml, 14.82 ± 0.3 ng/ml, respectively. Increasing the rate of bone metabolism: 79.2% patients with deficit and deficiency of vitamin D, 60% women with vitamin D deficiency, 28.6% women with normal levels of vitamin D. The number of patients, whose osteoresorption prevailed over osteosynthesis exceed 2:2 times. In the group with normal levels of vitamin D 1 patient (14.3 %) had elevated osteocalcin and CTX (45.0 ng/ml and 0.670 ng/ml), the second one (14.3 %) - normal levels of osteocalcin and CTX (24.68 ± 0.4 ng/ml and 0.392 ± 0.5 ng/ml). In the group with deficient of vitamin D - 9 women (60 %) had normal and elevated levels of osteocalcin CTX (23.73 ± 0.3 and 0.623 ± 0.2), 5 women (33.3 %) - had normal levels of osteocalcin and CTX (26.62 ± 0.4 and 0.382 ± 0.6). 1 woman (6.7%) had an increase of osteocalcin and CTX (119.34 ng/ml and 0.724 ng/ml). In the group with a deficit of vitamin D 13 women (54.2 %) had normal and elevated levels of osteocalcin CTX, (7.95 ± 0.4 ng/ml and 0.721 ± 0.2 ng/ml), 6 women (25 %) had an increase osteocalcin and CTX (71.21 ± 0.5 ng/ml and 0.876 ± 0.3 ng/ml), 4 women (12.5%) had a normal levels of osteocalcin and CTX (20.99 ± 0.4 ng/ml and 0.419 ± 0.7 ng/ml), one woman had reduced levels of osteocalcin and normal levels of CTX (4, 1 %, 13.04 ng/ml and 0.136 ng/ml).

Thus, women with deficiency and deficit of the vitamin D (gestation 37-41 weeks of pregnancy), had an increased rate of bone metabolism, with domination of osteoresorption. Pregnant women with
deficiency and vitamin D deficit have a risk of osteopenia and fractures in the postpartum period.