DAS28 is 2.78 ± 0.35, randomized into 2 groups. As basic therapy 20 patients (42.55 %) received methotrexate 7,5–15 mg per week, 23 patients (48.94 %) combined methotrexate with glucocorticoids 5–10 mg per day, 4 patients (8.51 %) received leflunomide 20 mg per day. Patients of the first group (n = 23) along with basic therapy were treated with osteogenon, the second group (n = 24) — basic therapy and calcium with vitamin D. Pain syndrome was assessed according to visual analogue scale (VAS) before treatment and after 1, 3 and 6 months. BMD was determined by dual energy X-ray absorptiometry.

Results. Pain decreased by 35.4 % ($p < 0.05$) in the group of patients receiving osteogenon and in the group receiving combination of calcium and vitamin D to 9.1 % ($p < 0.05$). Bone mineral density increased in the group receiving osteogenon (+ 6.9 %, $p < 0.001$) after 6 months of treatment, in contrast to second group, in which was not observed reliable dynamic (+ 1.35 %, $p > 0.05$).

Conclusions. More significant improvement of BMD was registered in first group in comparison with a group of patients that received the combination of calcium with vitamin D at recommended doses. ■

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Comparison of TBS and FRAX in fracture risk assessment of postmenopausal females with osteopenia

Introduction. More than half of osteopenic patients suffer from fracture (Fx), but BMD osteopenia is usually not considered for treatment initiation. To our knowledge there is no study which compares risk stratifying methods in Fx prediction of BMD non-therapy group.

Objective. Comparison of three methods, trabecular bone score (TBS), FRAX and FRAX adjusted for TBS in Fx risk prediction of postmenopausal (PM) females.

Methods. Observational cohort study of PM females with BMD osteopenia (defined as T-score ≤ −1 ≥ −2,5) during 2/2009-5/2015 was performed. Patients underwent TBS, FRAX and FRAX adjusted for TBS evaluation. Using NOF cutoff values of 20 % for major osteoporotic Fx and 3 % for hip Fx were used to consider patients at high absolute 10 years risk of Fx. With redard to TBS patients were divided to 3 groups: normal, moderate and degraded. According to temporary consensus guidelines patients with BMD osteopenia + very low (degraded) TBS (< 1,1) are at high risk of developing Fx. TBS Insight® tool was used to assess TBS derived from L-spine DXA scans. Primary endpoint during follow-up was clinical Fx/death.

Results. In total, 144 PM females (mean age 66,1 yrs., BMI 26,7 kg/m^2, T-score: neck —1,2; L-spine 1,4, TBS 1,24) were included. At baseline, 31,9 %; 30,5 and 34 % belonged to high Fx risk group according to TBS, FRAX and FRAX adjusted for TBS, respectively. Trend to increase Fx risk (RR 2,3; 95% CI 0,32; 12,5) was observed by degraded TBS. Fx/death probability was significantly 4,28-times higher in patients with degraded TBS value (RR 5,28, 95% CI 1,4; 19,1). Mean time to Fx/death was 4,4 yrs.

Conclusions. Patients with BMD osteopenia with degraded trabecular microarchitecture are at high risk of Fx. This study provides supportive results that TBS is appropriate method to assess high risk of Fx patients with BMD osteopenia. ■

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Dynamics of the tumor necrosis factor α at the osteopenic syndrome in pregnant women with perinatal infections

Introduction. The special role in the maintenance of immune homeostasis during pregnancy belongs cytokines like intercellular interaction mediators. Tumor necrosis factor α (TNF-α) is the multifunctional pro-inflammatory cytokines and are now widely discussed its role in bone's metabolism.

Objective. To study of the dynamic level of TNF-α in healthy pregnant women and pregnant women with osteopenic syndrome with verified perinatal infection (VPI) in the gestation's dynamics was.

Materials and methods. The 3 groups of pregnant women was examined: IA — the 192 women with osteopenic syndrome and VPI, IB – 43 women with VPI without osteopenia and II group — 128 healthy women. Inspection was spent in 2th, 3rd trimesters of pregnancy.

By the chemiluminescence immunoassay method defined concentration TNF-α in blood. The structural condition of the bone tissue was defined by the ultrasound osteodensytometric method.

By age, parity births, according extragenital diseases the survey group had no significant difference.

Variance of the Z-criterion in 2nd (−1.31 ± 0.04 SD) and 3rd (−1.98 ± 0.04 SD) trimester in the group I-A corresponded osteopenic syndrome already from second trimester ($P_{IA–II}$, $P_{IA–IB}$, $P_{IB–II} < 0.01$). In with increasing gestational age in the group IB (−0,90 ± 0,04 SD — 2nd trimester; −1.60 ± 0.07 SD — 3rd trimester) and in II group (−0.65 ± 0.03 SD and −1.22 ± 0.03 SD) deviation from the Z-criterion also showed of the bone's mineral density decrease. The bone quality index in all groups decreased with increasing gestational age (group IA: from 73.95 ± 0.65 to 65.37 ± 0.63 %; group IB: with 80.37 ± 0.94 to 71,91 ± 0,96 %; group II: from 85,25 ± ± 0,59 to 77,09 ± 0,61 %). At the perinatal infections all the osteodensytometrical parameters reliably were below.

Activity of the ФНО-α in 2nd (10.30 ± 0.15 pg/ml) and 3rd (2,98 ± 0,16 pg/ml) trimester at the osteopenic syndrome on the

infections background significantly ($p < 0,001$) exceeds its activity at healthy pregnant women ($5,37 \pm 0,17$ и $6,94 \pm 0,18$ pg/ml).

Conclusion. In pregnant women with the verified perinatal infection rates of ultrasonographic densitometry demonstrate significant decrease of the bone mineral density. In pregnant women with perinatal infection without osteopenic syndrome TNF-α level higher than that of healthy women, but lower than those infected and osteopenia. Possibly, the persisting infection and the high levels ФНО-α assist reduction of the bone tissue mineral density. ■

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Male hypogonadism and bone mass

Normal sex steroids hormone levels are essential for optimizing peak bone mass and their deficiencies during adulthood may modify the bone mass, as it causes bone loss by increased bone resorption and can be associated with a low BMD, osteoporosis or/and fragility fractures risk. Sex steroid hormones affect the skeleton by direct and indirect mechanisms. Androgens affect osteoblast activity and probably stimulate directly the bone formation and may exert a moderate resorption of the trabecular bone, similar to estrogens effects on bone. In male hypogonadism there is not enough sex steroid hormone synthesis by the testes, sperm or both; hypogonadism is also characterized by the lack of estrogen and unequivocally androgen: the bone disease of men with hypogonadism is associated with the absence of estrogen actions. In adult men with primary or hypogonadotropic hypogonadism due to bilateral orchiectomy there is a BMD decrease detectable 1 to 3 years after orchiectomy. These men had a rapid loss of vertebral bone mass (about 7 % per year) progressing together with an increased osteoclast activity, which is inhibited by non-aromatisable androgens; the rapid bone mass loss and increased bone turnover are more intense in the years just after orchiectomy, with a consequent diminished bone loss phase, a process menopause-like. In prepubertal secondary or hypogonadotropic hypogonadism there is a reduced BMD at the cortical and cancellous bone. GnRH analogues therapy (inhibition of the pituitary gonadotropins production and secretion originating gonadal deficiency) in adults is also related with a marked bone mass loss and osteoporotic fractures. Chronic glucocorticoid therapy may reduce substantially testosterone levels and contribute also to the bone mass loss.

Our group detected a significant low BMD at several skeletal sites in hypogonadal men, as compared with a group with normal gonadal function. Studies in chronic male hypogonadism revealed decreased rates of bone formation, increase in average of bone remodeling rates, increased levels of osteocalcin, interaction between testosterone and vitamin D metabolism and a reduction in the trabeculae number. The BMD is correlated with free testosterone plasma levels in old men. In prepubertal hypogonadism and growth hormone deficiency, vertebrae sizes are small due to short stature and vertebral fractures (compression or wedge) are frequent. Hypogonadism may contribute to severe osteoporosis in about 15 % of men; androgen deficiency is associated with 30 % of the osteoporotic vertebral fractures and hip fractures that occur most often in old hypogonadal men with vitamin D deficiency.

Testosterone therapy inhibits osteoclast activity and increases bone formation. Therapy of adult males with hypogonadism showed positive effects on BMD in most osteoporotic patients but the BMD may not normalize even if the testosterone levels are already normal for one year. Our group observed a significant low BMD in a group of hypogonadal men treated during 7 years. Finally, no data were published about osteoporotic fractures risk and testosterone therapy for the different types of male hypogonadism. ■

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Markers of bone tissue metabolism and their clinical significance in patients with chronic obstructive pulmonary disease

Introduction. Contradictions of the literature data on the relationship of vitamin D level with pulmonary functional parameters determine the aim of this research to study of vitamin D-status and markers of bone metabolism in patients with chronic obstructive pulmonary disease (COPD).

Materials and methods. 47 patients who were hospitalized because of exacerbation of COPD during the autumn-winter (September-December) period of 2012 were examined.

The average age of patients was (53.59 ± 12.83) years with the weight (78.80 ± 12.53) kg and height (170.54 ± 7.84) cm. The body mass index (BMI) was (27.17 ± 4.07). 27 (57.45 %) men and 20 (42.55 %) women were examined. 24 (51.06 %) patients were smokers, pack/years index was 29.08 ± 16.62. All patients were divided into the groups depending on the age and sex.

All patients were were determined such parameters as 1) markers of bone formation — type I procollagen propeptides (P1NP) and osteocalcin propeptydy first type procollagen, osteocalcin; 2) markers of bone resorption — β-C-terminal telopeptides of type I collagen (β-CTx); 3) hormonal regulation markers — Intact Parathyroid Hormone (IPH), total vitamin D level (25-OH vitamin D_2 and 25-OH vitamin D_3) with the use of the electrochemiluminescence method on Eleksys 2010 analyzer.

Results. Content of P1NP decreased by 82.96 % in patients with stage IV compared to stage I COPD ($p = 0.002$).