Bone turnover markers in women with postmenopausal osteoporosis depending on the level of vitamin D

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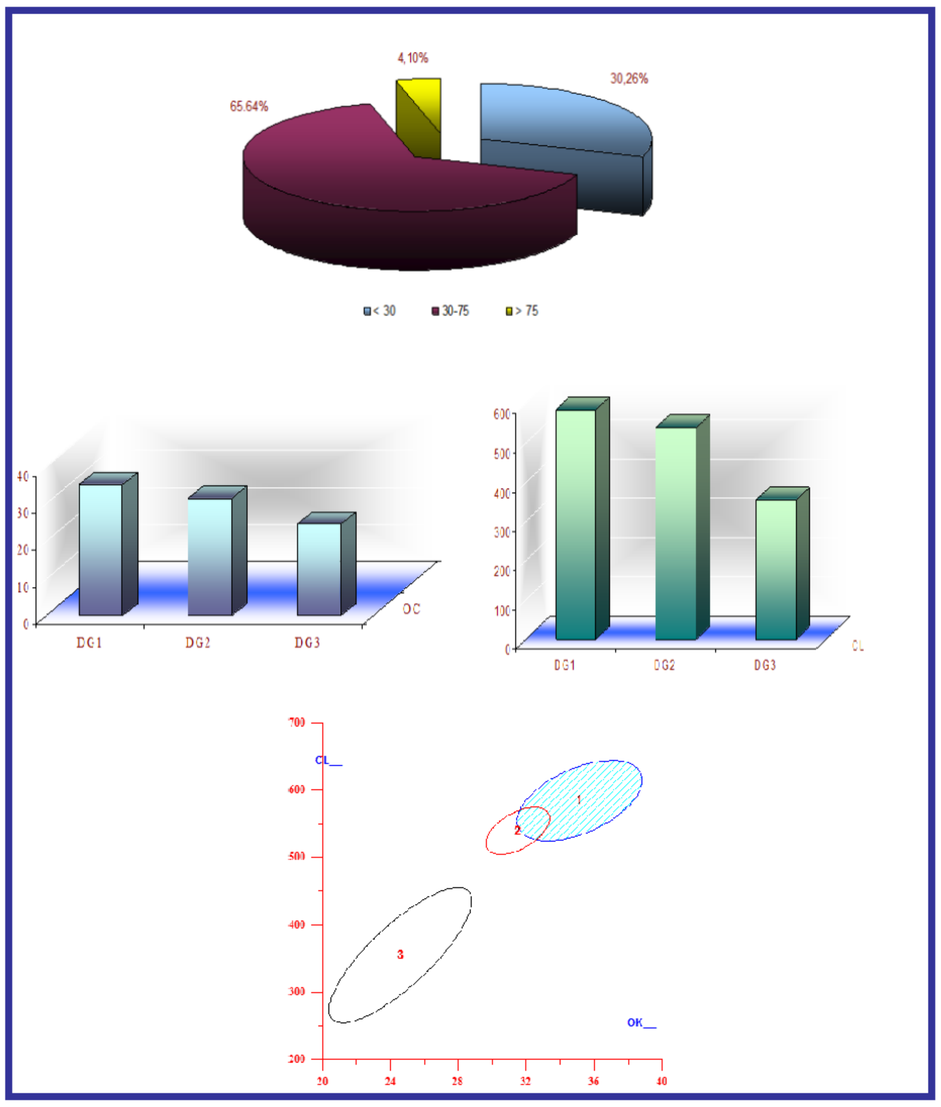
OBJECTIVES

It is indisputable importance of vitamin D for the preserved integrity of the skeleton and bone metabolism. The aim of the study was to analyze bone turnover parameters in relation to the vitamin D status in women with postmenopausal osteoporosis.

METHODS

This study included a total of 195 postmenopausal women with osteoporosis. Osteoporosis is diagnosed by DXA scan of the spine and hip. Bone turnover markers osteocalcin, β-CTX and 25OH vitamin D were determined by ECLIA method on Elecsys apparatus. Vitamin D status is defined as a deficiency if 25OH vitamin D was <30 nmol/l. Within the range of normal values of 25OH vitamin D(30-100nmol/l), insufficiency is defined if level of 25OH vitamin D is 30-75 nmol/l and a sufficient level of 25OH vitamin D>75 nmol/l.



RESULTS

The mean age was 60.30 ± 6.33 years and mean duration of postmenopausal period was 11.8 ± 5.51 years. The average body mass index (BMI) was 25.41 ± 4.26 kg/m^2. The average value of 25OHD was 39.98 ± 17.97 nmol/l, the average value of osteocalcin was 32.31 ± 11.97 ng/ml and the average value of beta-CTX was 545.31 ± 212.07 pg/ml. 25OHD level of <30 nmol/l in 59 (30.26%) subjects, the level of 25OHD 30-75 nmol/l had a 128 (65,64%), and vitamin D levels >75 nmol/l, had an 8 (4,10%) of subjects. There was a statistically significant difference in levels of osteocalcin and beta-CTX compared to the levels of vitamin D defined as a deficiency, insufficiency and sufficiency. Average values of osteocalcin in the above defined groups of vitamin D were 35.15 ± 14.26 vs 31.49 ± 10.77 vs 24.59 ± 5.38 ng/ml; p<0.1. Average values of beta-CTX in the above defined groups of vitamin D were 584.16 ± 230.77 vs 539.30 ± 201.33 vs 354.88 ± 128.33 pg/ml; p<0.01.

	DG 1 (< 30 nmol/l)				DG2 (30-75 nmol/l)				DG3 (>75 nmol/l)			
	x	SD	min	max	x	SD	min	max	x	SD	min	max
OC ng/ml	35.15	14.26	9.2	86.2	31.49	10.77	9.3	66.7	24.59	5.38	17.8	32.9
β-CL pg/ml	584.16	230.77	205.0	1188.0	539.30	201.13	126.9	1207.0	354.88	128.23	231.0	583.0

CONCLUSIONS

In women with postmenopausal osteoporosis dominates deficit and insufficient levels of vitamin D. Insufficient vitamin D leads to accelerated bone remodeling with a predominance of bone resorption over formation which contributes to the reduction of bone mass and quality.