

Effect of supplementation with vitamin D and calcium to excessive suppression of bone metabolism during antiresorptive therapy

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OBJECTIVES

Long-term therapy with bisphosphonates is considered a risk factor for the development of atypical fractures of the femur. One of the mechanisms of these fractures is excessive suppression of bone metabolism. The supplementation dose of vitamin D and calcium could have an impact on the degree of suppression of bone turnover.

The aim was to determine whether the presence or dose of supplementation with vitamin D and calcium during antiresorptive therapy have an impact on the achieved degree of suppression of bone metabolism.

METHODS

This was a prospective longitudinal study that included 200 postmenopausal women with antiresorptive treatment of osteoporosis. We analyzed osteocalcin, CTx and ionic calcium, before treatment and three months after starting the antiresorptive therapy, and dose of supplementation with vitamin D and calcium during the therapy. Based on the values of osteocalcin and CTx after three months of therapy, patients were divided into four groups:

Group 1 -accelerated bone metabolism

Group 2 -awaited response to therapy

Group 3 -excessive suppression of bone resorption (low CTx)

Group 4 -excessive suppression of bone remodeling (low CTX and low osteocalcin)

Calcium and vitamin D supplementation distribution among the groups

N=200	No Calcium		Calcium 500mg/day		Calcium 1000mg/day	
	n	%	n	%	n	%
Group 1	2.	10.5	13.	68.4	4.	21.1
Group 2	15.	20.3	50.	67.6	9.	12.2
Group 3	23.	26.1	51.	58.0	14.	15.9
Group 4	5.	26.3	13.	68.4	1.	5.3

$p < 0.1$ $p < 0.05$

N=200	No Vitamin D		Vitamin D 400 IU/day		Vitamin D 800 IU/day		Vitamin D ≥ 1200 IU/day	
	n	%	n	%	n	%	n	%
Group 1	1.	5.3	9.	47.4	9.	47.4	0.	.0
Group 2	3.	4.1	34.	45.9	27.	36.5	10.	13.6
Group 3	10.	11.4*	47.	53.4	27.	30.7	4.	4.5
Group 5	1.	5.3	10.	52.6	7.	36.8	1.	5.3

RESULTS

Calcium supplementation was carried out in 77.5% of patients, usually in a dose of 500 mg per day and vitamin D in 92.5% usually at a dose of 400 IU. The dose of calcium is satisfied recommended dose in 14% of cases, a dose of vitamin D in 42.5% of cases. Calcium supplementation was not associated with the degree of suppression of bone metabolism ($p=0.557$, $\chi=0.155$). Supplementation with vitamin D was not associated with the degree of suppression of bone metabolism ($p=0.652$, $\chi=0.241$). The values of ionic calcium before and during treatment were in the reference range.

CONCLUSIONS

Most patients with antiresorptive therapy for osteoporosis takes supplementation with vitamin D and calcium. The supplementation dose in many cases was less than the recommended dose. The degree of suppression of bone metabolism during antiresorptive therapy did not depend on the supplementation dose of calcium nor vitamin D.

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