

Calcium homeostasis in women with non-metastatic breast cancer with osteoporosis after a single dose of denosumab: a pilot study

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Aim: To assess the calcium homeostasis after treatment with denosumab in women with non metastatic breast cancer

Patients and Methods: We prospectively enrolled 42 female patients with osteoporosis, who were eligible for treatment with denosumab. Patients were divided in two groups. In Group A were included 24 healthy postmenopausal women (controls) and in group B were included 18 patients with non metastatic breast cancer.

A single-dose of denosumab (60mg) was administered to both groups, under standard calcium and vitamin D supplementation. Serum calcium, phosphorus, parathyroid hormone (iPTH) and 24hr urine calcium were measured at days 0, 7 and 180. Primary outcomes were the development of hypocalcaemia and secondary hyperparathyroidism.

Results: At baseline, both groups were comparable in age, calcium and iPTH levels. No events of hypocalcaemia were recorded. Overall, incidence of secondary hyperparathyroidism was found to be 45.5% one week after administration of denosumab. At day 7, iPTH was found to be significantly higher only in controls (Wilcoxon Signed Rank test: $p = 0.013$) compared to group-specific baseline values. Interestingly, at day 180 incidence of secondary hyperparathyroidism was higher in Group B in contrast to the pattern recorded in controls, although not reaching statistical significance. At day 180, borderline increase in iPTH of Group B was noted ($p = 0.08$), whereas iPTH returned to baseline in controls.

Conclusions: A pattern of delayed development of secondary hyperparathyroidism might be present in patients with non-metastatic breast cancer. It could be extrapolated that this finding might be associated with a partial functional defect in calcium sensing receptor, which has recently been implicated in the pathogenesis of breast cancer. The findings warrant further investigation.

		Group A	Group B
Age		59.5	57.5
Ca	0	9.79	10.015
	7	9.285	9.655
	180	9.63	9.72
P	0	3.57	3.855
	7	3.085	3.6
	180	3.325	3.61
PTH	0	42.995	46.53
	7	68.55	50.2
	180	45.64	60

Table: Biochemical changes from day 0 to 180, Ca: calcium, P: phosphorus, PTH: parathyroid hormone, 0: at baseline, 7: day 7, 180: day 180. Data are median