

Rapid improvement in the bone mineral density with vitamin D supplementation in postmenopausal woman with vitamin D deficiency

Sir,

A 50-year-old postmenopausal medical professional was detected with osteoporosis on a DXA scan and was advised bisphosphonate therapy [Table 1]. She reported to this hospital for advice. She was asymptomatic except feeling fatigued at the end of the day after work. Her clinical examination was unremarkable. Her biochemical investigations including hematological, liver, and renal functions were normal. Her serum calcium was 9.2 mg/ dl (9–11 mg/dl), inorganic phosphorus 3.4 mg/ dl (2.5–4.5 mg/dl), and serum alkaline phosphatase

Table 1: Change in bone mineral density after Vitamin D Supplementation: Change in bone mineral density after Vitamin D Supplementation

	Pretreatment BMD (g/cm ²)	Post-treatment BMD (g/cm ²)	Percent change
L1-L4 femoral neck	0.739	0.819	10.8
	0.669	0.715	6.8
	L1-L4 (Z-score)	Femoral neck (Z-score)	
Pretreatment	-2.3	-1.5	
Post-treatment	-1.2	-0.7	
	L1-L4 (T-score)	Femoral neck (T-score)	Interpretation
Pretreatment	-2.8	-1.6	Osteoporosis
Post-treatment	-2.1	-1.2	Osteopenia

BMD: Bone mineral density

200 IU/1 (60– 250 IU/1). Hormonal parameters were TSH 1.08 mIU/1 (0.5–6.5 mIU/1), vitamin D 10.3 ng/ml (>30 ng/ml), and PTH 76.9 ng/ml (12–72 ng/ml). She was started on oral vitamin D supplementation of 60,000 units weekly for 8 weeks, and then once monthly. After 1 year, vitamin D levels improved to 36.4 ng/ml and PTH was 43.6 ng/dl. Her repeat DXA scan showed marked improvement in the bone mineral density (BMD) in the range of osteopenia [Table 1].

This case though considered to be an anecdotal report highlights a pertinent question which is relevant to our context since >90% of our population above the age of 50 years is vitamin D deficient.^[1] With the proliferation of DXA machines and increasing awareness about osteoporosis particularly in cities, many elderly subjects undergo testing for BMD. Most females are diagnosed postmenopausal osteoporosis cases without considering the secondary cause of vitamin D deficiency (VDD), which is the commonest.^[2] In our patient, the Z-score of -2.3 at lumbar spine also suggested the possibility of a secondary cause, which was confirmed as VDD on hormonal evaluation. Most of patients with VDD do not have clinical or biochemical evidence of osteomalacia.^[1] Grados *et al.*^[3] reported significant improvement in BMD at lumbar spine (0.029 ± 0.057 g/cm², $P < 0.0001$) and femoral neck (0.010 ± 0.036 g/cm², $P = 0.025$) after 1 year of vitamin D supplementation in vitamin D insufficient postmenopausal women. Should all subjects with osteoporosis be treated with bisphosphonate or should a repeat BMD be done after a year of vitamin D supplementation? There is an urgent need for a larger study in India and other countries where the prevalence of VDD is very high,^[4] as was done in Bangladesh, where a study reported improvement in BMD after 1 year of vitamin D supplementation in premenopausal women with hypovitaminosis D.^[5]

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