

Fast and slow bone loss in women

A longitudinal study

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Conclusion:

Though the highest BMD was found in women with mandibular dense trabeculation, the largest bone loss was also found in this group, probably because dense trabecular bone has the largest bone surface and consequently most bone cells and bone remodelling.

Background:

Previously, it has been found that individuals with dense mandibular trabecular bone have normal BMD whereas sparse trabecular bone is a sign of osteopenia. Furthermore, dense mandibular trabecular bone is associated with a very low fracture rate (1.2%) whereas individuals with sparse mandibular trabecular bone have a high fracture rate (41%).

Methods:

130 women (22-75yrs old) visiting a public dental office participated in this 5-yrs prospective study. They underwent a DXA examination of the distal forearm twice five yrs apart. The mandibular coarseness of trabeculation was assessed on periapical dental radiographs as dense, alternating dense and sparse, and sparse.

Results:

Women with dense trabeculation had significantly higher BMD than women with alternating dense and sparse trabeculation, and the latter had significantly higher BMD than those with sparse trabeculation ($p < 0.001$). Mean bone loss in premenopausal women was $1.5\% \pm 4.98\%$ ($n=74$), and mean bone loss in postmenopausal women was $3.2\% \pm 5.6\%$ ($n=56$). The difference was highly significant ($p < 0.001$).

In both premenopausal and postmenopausal women bone loss was largest in those women who had a dense trabeculation in the mandible and least in those with alternating dense and sparse trabeculation ($p < 0.05$). In the group with sparse trabeculation 30% (7/23) have had a fracture, compared with 11% (10/91) with alternating dense and sparse trabeculation, and zero with dense trabeculation ($p=0.01$).

Table I. Data of 130 women.

Trabeculation	Dense	Dense & sparse	Sparse
n	16	91	23
Initial BMD %	96.1 (80-111)	89.0 (63-113)	72.3 (46-84)
Final BMD %	90.8 (75-105)	87.6 (60-118)	69.0 (42-87)
BMD loss %	$5.3\% \pm 6.38\%$ (-5 to 22)	$1.4\% \pm 4.86\%$ (-11 to 17)	$3.3\% \pm 4.97\%$ (-4 to 15)
Initial BMD group	Normal BMD >88%	Osteopenia	Osteoporosis $\leq 70\%$
n	61	55	14
Initial BMD %	97.3 (89- 113)	81.3 (70-88)	62.9 (46-69)
Final BMD %	94.8 (75- 116)	79.7 (59-94)	60.1 (42-70)
BMD loss %	$2.5\% \pm 5.94$ (-11 to 22)	$1.6\% \pm 4.54$ (-6 to 15)	$2.8\% \pm 4.44$ (-4 to 10)

Table II.

Bone loss (BMD loss %) in premenopausal and postmenopausal women with different trabecular structure: dense, alternating dense and sparse, and sparse trabeculation.

Trabeculation	n	BMD loss%	SD %	Range %
Premenopausal				
Dense	7	4.14	4.60	-5 to 9
Dense & sparse	58	1.10	5.01	-7 to 17
Sparse	9	1.78	4.94	-4 to 10
Postmenopausal				
Dense	9	6.22	7.64	-5 to 22
Dense & sparse	33	1.94	4.97	-11 to 10
Sparse	14	4.36	4.89	-4 to 15

