History, Low BMD Raise Long-Term Fracture Risk

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Low bone mineral density and a prevalent vertebral fracture were long-term independent predictors of an increased risk of vertebral fractures in women aged 65-99 who were followed for almost 15 years.

Previous studies have shown links between low BMD and an increased risk of a new vertebral fracture and between a prevalent vertebral fracture and an increased risk of a new vertebral fracture after an average of nearly 4 years.

But this study was the first to assess the long-term absolute risk of vertebral fracture based on follow-up evaluations of community-dwelling older women (JAMA 2007;298:2761-67).

In this study, Jane A. Cauley, Dr.PH., of the department of epidemiology at the University of Pittsburgh, and her colleagues reviewed data from 2,680 white women who took part in the longitudinal Study of Osteoporotic Fractures. The average age at baseline was 68.8 years and the average age at follow-up was 83.8 years.

After an average of 14.9 years, 487 women (18.2%) had incident vertebral fractures. This number included 163 of the 394 women (41.4%) who had a prevalent vertebral fracture at baseline and 324 of the 2,286 women (14.2%) who didn't have a vertebral fracture at baseline.

Overall, women with a prevalent fracture were more than four times as likely to suffer an incident vertebral fracture during the follow-up period, compared with those with no fracture history. The association remained significant after the researchers controlled for BMD and other risk factors for vertebral fracture, and the risk was greatest in women who had at least two prevalent vertebral fractures when they enrolled in the investigation.

In addition, a low baseline BMD at several sites (the calcaneus, distal radius, total hip, femoral neck, and lumbar spine) was a significant predictor of incident vertebral fractures during the follow-up period.

After adjustment for risk factors including smoking, body mass index, and estrogen use, about a third of women with a hip BMD T score of –2.5 or less (which is considered osteoporotic) developed incident fractures during the follow-up, compared with about 10% of those with normal BMD scores.

Women with a prevalent fracture were more than four times as likely to suffer an incident vertebral fracture during follow-up, than were those with no fracture history.

Women with both a prevalent vertebral fracture and total hip BMD T scores of –2.5 or less had an absolute risk of an incident vertebral fracture greater then 50%, compared with a 9% risk among women with a normal BMD and no fracture history.

But women with baseline prevalent vertebral fractures were at increased risk of additional fractures during the follow-up period regardless of BMD, and the interaction between BMD and prevalent vertebral fractures was not statistically significant.

This finding suggests that the presence of a vertebral fracture may indicate deterioration in bone quality, not just bone density, the investigators wrote. "Our results support the recommendation that older women with a prevalent vertebral fracture should be treated for osteoporosis irrespective of BMD."

In addition, women who had incident fractures tended to be older, thinner, and less likely to report estrogen use. The results were consistent with the short-term findings from the Study of Osteoporotic Fractures and from other similar studies. But the study was limited by its inclusion of white women only, and the results may not be applicable to men or women of other ethnicities. Also, the absolute risk of vertebral fractures may be higher than reported because the study subjects who returned for the follow-up examinations were healthier at baseline than were patients who were lost to follow-up, the researchers noted.

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