



Spinal vertebral fractures among US Caucasian women: New statistics and new insights

Dr. Susan E. Brown, PhD

Osteoporosis researchers in the past have estimated that 35 to 50% of all Caucasian postmenopausal women experience a spinal vertebral fracture.¹ This figure has always seemed high to me, and for some time I have been looking for “solid” statistics on these rather elusive spinal vertebral fractures. I call spinal vertebral fractures elusive because two-thirds of these fractures are “silent” and not even noticed by the people experiencing them. They can, however, be seen through an x-ray exam.

Now for the first time we have solid, long-term data on spinal vertebral fracture incidence among US Caucasian postmenopausal women. The new data from the US Study of Osteoporotic Fractures covers a 15-year observation period looking at nearly 2700 Caucasian women who were a mean age of 69 years old at the start of the study. Over the 15-year observation period the incidence of new spinal vertebral fractures was carefully studied using x-ray exams.² What researchers found was the following:

- ❖ Overall, 18.2% of all women in the study developed a spinal vertebral fracture visible on x-ray over the 15-year period.
- ❖ 14% of the women who came into the study without any vertebral fracture developed such a fracture during the 15 years.
- ❖ Only 9% of the women with normal bone density and no previous fracture came to have a vertebral fracture during this 15-year period.
- ❖ Among women with an osteoporotic lumbar spine bone mineral density, but no existing vertebral fracture at baseline, 23.3% came to fracture a vertebra during the study. An osteoporotic bone density is defined as being 2.5 standard deviations or greater below the average bone density of young women.
- ❖ Among women with an osteoporotic total hip bone mineral density T score (i.e., -2.5 T or more), but no existing vertebral fracture at baseline, 28.3% came to fracture a vertebra during the study.

¹ Cooper, C., O'Neill, T., Silman, A. European Vertebral Osteoporosis Study Group. 1993. The epidemiology of vertebral fractures. *Bone*, 14(suppl 1):S89-S97; Melton III, L. J. 1997. Epidemiology of spinal osteoporosis. *Spine*, 22(24)(suppl):2S-11S; Melton III, L. J., S. H. Kan, M. A. Frye et al. 1989. Epidemiology of vertebral fractures in women. *Am J Epidemiol*, 129(5):1000-1011; Wasnich, R. D. 1996. Vertebral fracture epidemiology. *Bone*, 18(3)(suppl):179S-183S; Cooper, C., Atkinson, E. J., O'Fallon, W. M., and Melton, L. J. III. 1992. Incidence of clinically diagnosed vertebral fractures: A population-based study in Rochester, Minnesota, 1985-1989. *J Bone Miner Res*, 7(2):221-227.

² Cauley, J. A., Hochberg, M. C., Lui, L. Y., et al. 2007. Long-term risk of incident vertebral fractures. *JAMA*, 298(23):2761-2767.



- ❖ Among those women who came into the study with an existing vertebral fracture, 41% of them experienced a new fracture over the 15 years. This was true even if they did not have low bone density.
- ❖ The highest risk of fracture was among women who came into the study with osteoporotic BMD (-2.5 T or more) and also had an existing vertebral fracture at the start of the study. A full 56% of these women suffered a new vertebral fracture during the 15-year study.
- ❖ Even women with previously undetected “silent” spinal vertebral fractures at baseline had a 4-fold increased risk of experiencing a new fracture, as compared to those who had no spinal vertebral fractures at the start of the study. This was true even if they did not have low bone density.
- ❖ The strongest predictors of fracture were previous fracture, advancing age, and lower weight.

So what does all this mean? What are the important implications of this large, long-term study?

1. A US Caucasian woman’s risk of experiencing a spinal vertebral fracture has been overstated.

The results of this study suggest that earlier estimates of spinal vertebral fracture incidence have overestimated real fracture incidence. Over fifteen years, from age 68 to 84, only 18% of all US Caucasian women experienced a vertebral fracture. Overall, counting those who entered the study with an existing vertebral fracture, a little over 26% of all women had radiological evidence of a spinal fracture by age 84. This figure is significant, yet not as worrisome as the 35-50% estimate previously reported.

2. Many spinal fractures, at least in Caucasian women, occur before they reach seventy.

In this study, 14.7% of all women experienced a vertebral fracture before entering the study at a mean age of 68.8 years. During the 15 year study a total of 18.2% ended up with a spinal fracture. Thus, nearly as many women fractured before their late 60’s as did after their late 60’s (between 68.8 and 83.8 years of age).

3. And just how important are these spinal vertebral fractures?

To put this study into perspective we must remember that only 1/3 of all spinal vertebral fractures are clinically recognized. Most are never detected by the person suffering the fracture or by his/her doctor. These fractures are not painful or troubling enough to notice. Multiple spinal vertebral fractures, however, can cause significant pain, height loss, the development of a dowager’s hump, and, if extreme, compromise breathing, balance and mobility.



4. Having one or more spinal vertebral fractures does in fact increase your risk for having others.

Another impressive finding from this long-term study is the increased risk of a new fracture for women who entered the study with an existing spinal vertebral fracture. For some time, it has been suggested that those who have experienced a spinal vertebral fracture are at greater risk for having another. In this study the risk of experiencing a spinal vertebral fracture over the 15-year study was increased 5-fold if one came into the study having had a previous spinal vertebral fracture. Of those found to have any previous spinal vertebral fracture, 41% experienced a new spinal vertebral fracture over the 15 years.

Even “silent,” unnoticed fractures indicated a 4-fold increased likelihood of other vertebral fractures. Other short-term studies have also shown that a prevalent vertebral fracture is associated with a 5-fold increased risk of sustaining a new vertebral fracture.³

Anyone, woman or man, should pay special attention and work especially diligently to improve your bone health if you experience a fracture—any low-trauma fracture likely suggests you are more vulnerable to other fractures. As I have said, most vertebral body deformities go unnoticed, but you can have these assessed as part of your bone density test. As an “add-on” to your bone density test you can ask for an imaging of the vertebrae to detect deformities and fractures. This is known as a measurement of “vertebral morphometry” and with this you can see “silent” vertebral deformities and fractures. If such “silent” fractures, or even slight deformities, are seen, one should redouble his/her efforts at implementing a program of nutritional and lifestyle support, such as the Personal Program for Better Bones (you can learn more about this program for women [here](#).)

5. Bone mineral density is an important risk factor, but still does not determine fracture risk by itself.

Lower densities increase fracture risk, but do not determine the risk. Keep in mind that most fractures occur in women who do not have osteoporosis based on BMD alone. Those who fracture generally have other factors contributing to bone weakness, including lower levels of vitamin D, the use of bone-depleting medications, lack of physical activity, little muscle strength, older age, low body weight, a metabolic acid load, and the like. In this study it was shown that the strongest predictors of fracture risk were previous fracture, advancing age, and lower weight. (You can use our [fracture risk and bone health profile](#) to learn about your risk of fracture).

6. It is wise to look beyond osteoporosis medications for fracture prevention.

Over the 15 years of this study several osteoporosis medications became available. Many women in the study were given these medications over the years by their physicians. The use of such medications was

³Black, D. M., et al. Study of Osteoporotic Fractures Research Group. 1999. Prevalent vertebral deformities predict hip fractures and new vertebral deformities but not wrist fractures. *J Bone Miner Res*, 14(5):821-828.



significantly higher in women who had a fracture during the study (51%) than among those who did not fracture (42%). As the researchers report, the use of bone medications did not have a significant impact on study findings. Whether they used bone drugs or not, the women with previous fracture, lowest weight, lowest bone density and more advanced age had the highest rate of new fractures.

7. The likelihood of experiencing an osteoporotic fracture varies greatly from individual to individual depending on the number of risk factors one exhibits.

The more risk factors you have, the more imperative it is to develop an effective bone strengthening and fracture-prevention plan. It is our long-held position that the best approach to fracture prevention is a comprehensive, holistic nutrition and lifestyle program. (Read more about this in our article on [bone-healthy lifestyle](#).)



Susan E. Brown, PhD
Center for Better Bones
605 Franklin Park Drive
East Syracuse, NY 13057
www.betterbones.com