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Bisphosphonate therapy: When *not* to monitor BMD

Monitoring bone density within the first 3 years of therapy does not provide useful information—and it is costly besides.

PRACTICE CHANGER

After starting patients on bisphosphonates for osteoporosis, wait at least 3 years before ordering a repeat dual-energy x-ray absorptiometry (DXA) scan.¹

STRENGTH OF RECOMMENDATION

C: Based on a secondary analysis of a large randomized controlled trial.

Bell KL, Hayen A, Macaskill P, et al. Value of routine monitoring of bone mineral density after starting bisphosphonate treatment: secondary analysis of treatment data. *BMJ*. 2009;338:b2266.

ILLUSTRATIVE CASE

CASE ▶ Ms. K, a 68-year-old woman diagnosed with osteoporosis on a screening DXA scan a year ago, has been taking a bisphosphonate ever since. She's anxious to know whether the medication is working and asks if it's time for a repeat DXA scan. What should you tell her?

Fragility fractures from osteoporosis are common in postmenopausal women. In the year 2000 alone, an estimated 9 million such fractures occurred worldwide.² Treatment with bisphosphonates has been found to reduce the risk of fragility fractures,³ and the United States Preventive Services Task Force (USPSTF) recommends a DXA scan to screen for osteoporosis in women older than 65 years and some younger women at increased risk.⁴

Monitoring treatment: How often?

Although recommendations for how often to monitor bone mineral density (BMD) after initiating treatment vary, the consensus has been that periodic monitoring is useful. But there have been no randomized trials evaluating BMD testing in patients taking bisphosphonates.

The use of DXA scans to identify osteoporosis has been shown to be a cost-effective strategy in women older than 65 years,⁵ but there has not been a cost/benefit analysis of follow-up DXA scanning after initiating treatment. The cost of a scan ranges from about \$150 to \$300, and it is not known how many patients undergo repeat DXA scanning after starting treatment.

STUDY SUMMARY

Yearly scans are not helpful

The study we report on here is a secondary analysis of data from the Fracture Intervention Trial (FIT).⁶ In 1993, FIT randomized 6457 US women ages 55 to 80 years with low hip bone density to either alendronate or placebo. The initial dose of alendronate was 5 mg/d, but was later increased to 10 mg/d when other studies found that the higher dose was more effective. FIT showed that alendronate increased BMD and decreased the risk of vertebral fracture.⁷

Bell et al¹ used a mixed-model statistical analysis to compare “within-person varia-

tion" in BMD (variation in DXA results over time in *individuals*) and "between-person variation" in BMD (variation in DXA results over time in the *population* of patients). The BMD of all FIT participants in both the control and treatment groups was measured at baseline and at the 1-, 2-, and 3-year marks. Each individual was always tested on the same scanner to minimize differences in machinery.

Individual results vary from year to year. The researchers found that the within-person variation was about 10 times greater than the between-person variation. This finding suggests that the precision of DXA scan measurements is not that reliable from 1 test to another.

The average annual increase in BMD in patients in the alendronate group was 0.0085 g/cm²—which is smaller than the typical year-to-year (within-person) variation of 0.013 g/cm². It would therefore be difficult to differentiate the medication's effect from the random variation inherent in DXA scans.

Response is favorable after 3 years of treatment. While there is variation in test results from year to year, longer-term findings are more reliable. After 3 years of treatment, 97.5% of patients taking alendronate had an increase in hip BMD of at least 0.019 g/cm², with a strong correlation between hip and spine measurements. Although this represents a relatively small change in Z and T scores, this increase in hip BMD is considered a favorable response that warrants continued treatment. These findings are consistent with a previous analysis of BMD monitoring in women taking bisphosphonates, in which those who had the largest drop in BMD after the first year of treatment typically had a large gain over the second year.⁸

WHAT'S NEW

Now we know early testing is unnecessary

Not many studies are available to provide guidance about the interval between BMD measurements after starting a bisphospho-

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nate. This study advises us that it is not necessary to recheck BMD for at least 3 years after starting treatment. Elimination of early repeat DXA testing could result in significant cost savings.

CAVEATS

Findings contradict usual recommendations

Physicians should be aware that the conclusion of this study is not in line with recommendations from a number of prominent organizations. The American Association of Clinical Endocrinology,⁹ the National Osteoporosis Foundation,¹⁰ and the North American Menopause Society¹¹ all recommend follow-up DXA testing in 1 or 2 years.

High-risk patient exception. The delay in repeat DXA testing may not be appropriate for patients at higher risk of bone density loss. However, a separate analysis of higher-risk groups was not done.

Finally, while the findings of Bell et al suggest that we should wait at least 3 years before retesting, it is still not clear whether there is any benefit to repeat DXA testing at any interval, given the nearly universal response rate. It is also possible that advances in DXA technology will reduce some of the variation in BMD results.

CHALLENGES TO IMPLEMENTATION

Anxious patients

Patients like Ms. K may ask their physicians to retest well before 3 years. Yet those who undergo scanning after a shorter interval may be discouraged by early results. Advising patients that the treatment is almost uniformly effective in increasing BMD should reassure them that sticking with treatment is worthwhile. **JFP**

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CONTINUED

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QUESTION

How long do you typically wait after initiating bisphosphonate therapy before ordering a repeat DXA scan?

- 1 year
- 2 years
- ≥3 years
- It depends on the patient.
- Other_____

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