EDITORIAL

Osteoporosis Screening—2 Steps May Be Too Much for Women Younger Than 65 Years

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The 2018 US Preventive Services Task Force (USPSTF) osteoporosis screening statement[1] includes separate B recommendations (moderate certainty of moderate net benefit) for bone density screening in women 65 years or older and in postmenopausal women younger than 65 years who are at increased risk of osteoporosis, as determined by a formal clinical risk assessment tool. The B recommendation for routine osteoporosis screening in all women 65 years or older has been an enduring and evidence-based feature of the USPSTF recommendations since 2002. Unfortunately, the B recommendation for a 2-step strategy of risk-factor assessment before bone-density testing in postmenopausal women younger than 65 years does not match existing evidence. Instead, the evidence for 2-step osteoporosis screening in women younger than 65 years would be better characterized by an I statement; ie, the evidence is insufficient to determine the balance between benefits and harms.

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Potential Benefits of 2-Step Osteoporosis Screening

The potential benefit of osteoporosis screening is a reduced rate of fractures, especially hip and vertebral fractures that cause the greatest mortality and morbidity. The highest-quality evidence supporting osteoporosis screening comprises the treatment trials demonstrating reduction of hip and clinical vertebral fractures in postmenopausal women selected by age, in whom osteoporosis was identified by bone-density testing.[2] Based on data from the Fracture Intervention Trial of bisphosphonate use in postmenopausal women aged 54 to 81 years with low bone density and without vertebral fracture at baseline,[3] the estimated numbers needed to screen (NNS) to prevent 1 hip fracture over 5 years are 1667, 1000, and 556 for postmenopausal women aged 55 to 59 years, 60 to 64 years, and 65 to 69 years, respectively.[4] The analogous NNS values for vertebral fracture over 5 years are 625, 435, and 233.[4] The high NNS values in postmenopausal women younger than 65 years reflect well-documented age trends in population fracture incidence[5]; ie, the younger the woman, the lower the 5-year rates of hip and clinical vertebral fracture in her age group, and the greater number of women who need to be screened in the population to find one who will benefit from treatment. No data are available on the benefit of osteoporosis treatment beginning at age 50 to 59 years and continuing over 3 or 4 decades,[6] so early treatment is not an evidence-based rationale for routine screening before age 65 years.

The NNS estimates are not available for a 2-step screening procedure, but they would be higher because the FRAX fracture risk assessment tool most often proposed for prescreening performs only modestly better than chance to identify postmenopausal women aged 50 to 64 years with femoral neck osteoporosis.[7] Also, a prescreening step does not ensure selection of a patient population more likely to benefit from treatment. For example, a 2001 randomized clinical trial demonstrated that risedronate significantly reduced the risk of hip fracture among women aged 80 years or older with confirmed osteoporosis, but not among women aged 70 to 79 years selected primarily based on risk factors other than low bone mineral density.[8]

The evidence suggests that osteoporosis treatments can reduce hip and vertebral fractures in postmenopausal women with osteoporosis by bone-density criteria, but that routine use of 2-step osteoporosis screening in postmenopausal women younger than 65 years would be highly inefficient to identify those likely to benefit from treatment.

Potential Harms of 2-Step Osteoporosis Screening

The potential harm of a 2-step protocol is that prescreening will not increase the clinical value of bone-density screening for patients. If complicated risk tools perform no better than age alone to identify screening candidates, women younger than 65 years may be subjected to inefficient screening procedures. Multiple observational studies have demonstrated that age and weight are as strongly associated with osteoporosis and fracture outcomes as more complicated risk tools.[4] Moreover, 4 of the 11 non-bone-density clinical risk factors in the FRAX tool do not apply to the USPSTF primary care population, which excludes patients with previous low-trauma fracture, secondary causes of osteoporosis (including rheumatoid arthritis), or long-term glucocorticoid use. Considering the poor fit of some risk tools to the primary care population and the lack of a clinical trial comparing an age-based protocol to risk-tool prescreening, a B recommendation for 2-step screening in postmenopausal women younger than 65 years is unjustified. Indeed, a modeling study[9] reported that differences in average effectiveness among osteoporosis screening strategies (including bone density testing alone or with risk-factor prescreening) for postmenopausal women are likely to be small, offering a compelling reason for the USPSTF to conduct its own comparative effectiveness analysis.

The opportunity costs of a 2-step screening protocol are high in the primary care setting where the clinician's next patient may be an elderly person with chest pain and abnormal findings on electrocardiogram. The clinician could spend half of a 15-minute

clinical visit accessing a risk tool and asking the patient about unfamiliar risk factors (eg, secondary causes of osteoporosis) to make 1 decision out of the dozen or more compressed into an annual physical examination. Sadly, only 26.5% of women aged 65 to 79 years and 12.8% of women aged 80 years or older received osteoporosis screening between 2008 and 2014,[10] despite the fact that the USPSTF and others have recommended routine osteoporosis screening in women aged 65 years or older for over 15 years. Overly complicated clinical practice guidelines may be one reason for the low screening rates.

Knowledge of low bone density can cause patients to have anxiety despite lack of symptoms,[11] and the time period of anxiety is extended for those who are tested early. Because they have lower fractures rates compared with older women, postmenopausal women younger than 65 years are at higher risk of overtreatment leading to potential net harms including gastrointestinal upset, osteonecrosis of the jaw,[12] atypical fractures of the femur,[13] and being left with fewer treatment options when hip fracture risk increases sharply after age 70 years.[5]

As age increases, the likelihood increases that the benefits of osteoporosis screening will outweigh harms. Thus, identifying an optimal age range to use bone-density testing is an important but unresolved issue for patients, clinics, and the general population.

Next Steps

Instead of the B recommendation, an I statement from the USPSTF would have been more helpful to motivate further work on the osteoporosis screening protocol for postmenopausal women younger than 65 years. In its next set of recommendations, the USPSTF should use decision modeling to inform an optimal osteoporosis screening approach. A decision model would ideally test age ranges and intervals for bone-density testing across the entire age spectrum of postmenopausal women, as well as compare risk-assessment tools vs age alone to decide which women younger than 65 years should receive bone-density tests. Similar modeling should be conducted for men if adequate data are available. In all osteoporosis screening recommendations, the harms of opportunity costs to patients and clinicians should be weighed. Given the myriad responsibilities of primary care practices caring for patients with high-acuity conditions, implementation of screening programs that are needlessly complex is burdensome and distracts from high-value medical care.[14]

In summary, existing evidence supports routine osteoporosis screening in women 65 years or older. For postmenopausal women younger than 65 years, evidence is inconclusive, and further examination of osteoporosis screening protocols is necessary. As the United States spends more dollars to achieve worse health care outcomes than other industrialized countries,[15] the worst mistakes we can make are to underuse an effective screening protocol that has been made unnecessarily complex, or overuse a prescreening step that adds uncertain value.

ARTICLE INFORMATION

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