

COMMENTARIES

Osteopenia: A Risk Factor that Deserves Some Respect

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Commentary on:

- Sornay-Rendu E, Munoz F, Garnero P, Duboeuf F, Delmas PD. Identification of osteopenic women at high risk of fracture: the OFELY study. *J Bone Miner Res.* 2005 Oct;20(10):1813-9.
- Szulc P, Munoz F, Duboeuf F, Marchand F, Delmas PD. Bone mineral density predicts osteoporotic fractures in elderly men: the MINOS study. *Osteoporosis Int.* 2005 Oct;16(10):1184-92.

Clinicians and clinical researchers who care about reducing the incidence of fragility fractures are beginning to learn lessons that have been apparent in other medical areas for some time. Diseases such as hypertension or hypercholesterolemia predispose both men and women to complications, including myocardial infarction and stroke. These conditions are defined by levels of blood pressure or blood lipids that exceed an agreed upon norm, in recognition of the fact that the greater the extent of abnormality, the greater the risk to the affected individual for the clinical event that is the complication of the disease (1). Fragility fractures are a complication of lower than normal bone mass, predominantly occurring in postmenopausal women and older men who have experienced varying degrees of age-related bone loss. Just as there are designated cut-off points that identify abnormal levels of blood pressure or LDL cholesterol that qualify as reflecting a "disease" state, cut-off points have been set by the WHO (2) for the quantity of bone mass, estimated by measuring bone mineral density (BMD), considered to be below normal. Less than normal BMD is further characterized as either low bone mass (osteopenia) or osteoporosis, based on the number of standard deviations below the average value in healthy, young, normal subjects at peak bone mass. At least according to most

current US guidelines, osteoporosis is a disease that requires pharmacological treatment. Many view osteopenia as merely a precursor of future osteoporosis in some people - and there is substantial disagreement about when and if treatment is indicated in patients with this diagnosis (3;4).

The two studies reported by researchers in Lyon (5;6) and summarized here note that most men and women with fractures actually have osteopenia, and this is compelling us to re-frame the way we think about low bone mass and fracture risk in older individuals, just as our cardiology colleagues have had to reassess and redefine over time how much hypertension is too much to ignore, and which levels of hypercholesterolemia warrant efforts to lower them. First, we need to recognize that all of these declared abnormal ranges of values reflect a *continuum of risk* – the higher the BP or lipid level, or the lower the BMD, the greater the risk of the complication. At some point, the risk is high enough that an intervention is warranted to lower risk. Inexpensive interventions, such as lifestyle alterations involving diet, exercise or smoking cessation, can be applied to lower risk in virtually everyone at even minimal risk, but when interventions are costly and the resources for paying for them are limited, these interventions are reserved for those at the highest risk, where they are most cost-

effective. In each of these disease states, it is clear that the risk of the clinical event is highest in those with the worst constellation of risk factors. For example, the obese, diabetic smoker with a severe elevation of blood pressure or LDL cholesterol is at high risk for a heart attack, just as the frail, elderly woman with a history of early menopause, a femoral neck T-score of -3 and a prior vertebral fracture is at high risk of a hip fracture. In both cases we should try diligently to lower risk. However, there are far more people in the world today at moderate risk than at high risk, so if tallies of the numbers of people with complications of these diseases are made, it is apparent that the majority of events – the complications that cost society a great deal of time and money to treat - are actually occurring in people with less severe levels of increased risk, because there are so many more people in that category.

Both of these papers make at least two very important points. First, they support findings from other recent studies that have indicated that, in postmenopausal women, most fractures are occurring in those with osteopenia, who as individuals are at more moderate risk than osteoporotic subjects, because there are more people in that diagnostic grouping (7-9). Second, they emphasize that risk stratification through the use of combinations of risk factors in osteopenic individuals is critical to help sort out degrees of risk, because within that broad category of people, some will be at higher and some at lower absolute risk for future fracture. The current efforts of the WHO to establish an evidence based method for assessing 10 year fracture probability, using specified risk factors in combination with BMD measurements (in those parts of the world where BMD is available), should help identify those older women and men at relatively low, moderate or high risk of fracture, whether osteopenic or osteoporotic by BMD. Determination of fracture probability will be a universally applied process, but decisions regarding the level of fracture probability at which to intervene with medical treatment will be made by each country based on societal values and health economic considerations. If we truly hope to lower the numbers of

fractures experienced as people age, we need to take a much more sophisticated view of what risk assessments tell us, and do a much better job both identifying those individuals at some level of increased risk and determining which ones we really do need to treat.

Conflict of Interest: The author reports that no conflict of interest exists.

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