HIP fracture remains the most feared of the so-called fragility fractures in older adults. It is the result of trauma (frequently from falling) and osteoporotic bone. A decade ago, only prolonged estrogen replacement in early menopause was accepted as diminishing femoral fracture incidence. Later, a French study reported that vitamin D and calcium replacement significantly decreased fracture incidence in older women (mean age of 88 years) in nursing homes (1). A large study of free-living individuals, however, did not replicate this finding (2). These individuals, however, were younger, and there was a tendency to reduce fractures with vitamin D supplementation. Because it is clear that vitamin D levels decrease with age (3), this difference in age may account for the difference in findings. These results suggest that calcium and vitamin D supplementation should be provided for all older individuals living in nursing homes.

More recently, a series of reports have documented that alendronate decreases fracture incidence (including femoral fracture) in vitamin D- and calcium-replete postmenopausal women across a wide range of ages and bone densities (4–6). This therapy increases bone mass. Other bisphosphonates seem likely to offer similar benefits when they become available (7). Selective estrogen receptor modulators like tamoxifen and raloxifene also hold promise to reduce hip fracture incidence (8). In addition, they may also reduce breast cancer incidence or recurrence.

Other modalities, such as exercise, may also reduce fracture incidence in older women. A report in this issue demonstrates an increase in femoral bone mineral density (BMD) in women wearing weighted vests and performing weight-bearing exercise on a regular schedule (9). A much shorter study published recently failed to demonstrate any significant change in markers of bone formation and resorption (10). The major difference in the two studies is length of time of follow-up, which is considerable. Interventions that effect bone mass frequently require at least 6 months to begin to alter bone mass. Similarly, exercise protocols require a finite length of time to have effects. Effects of resistance exercise are frequently said to be maximal at 6 months, although some report improvement up to 12 months (11). The short-term study did not specify or mandate exercise. No effects on strength were noted. Not surprisingly, no effect on bone metabolism was noted either. Specific weight-bearing exercise (jumping) was mandated in the longer study. The study was carried out long enough to see effects. Thus, it should not be surprising that the short-term study had minimal results, and the long-term study, published in this issue, had more demonstrable effects.

As information accumulates about successful prevention of femoral fracture in women, attention is bound to shift to other aspects of this problem. Osteoporosis and hip fracture remain poorly studied in men. Thus, there is no widely promulgated definition of osteoporosis/osteopenia for men, such as the World Health Organization has done for women. Reports suggest that accepting similar population-based definitions describe a group of men with increased risk for fracture (12). Thus, a BMD of more than 2.5 standard deviations below the mean for young men would be pathologic bone loss in older men. Other measurements may be better identifiers of fracture risk, however. The most tantalizing of these in men is low bioavailable testosterone. Serum testosterone declines with age in longitudinal studies, and sex hormone binding globulin rises with age (13). Therefore, testosterone available to tissues, or bioavailable testosterone, declines with age more than the apparent decline in total testosterone.

In case control studies, men with hip fractures are commonly reported to have very low (i.e., hypogonadal) serum levels of testosterone (14). Kenney and her colleagues report bone density results in men over the age of 65 with low levels of bioavailable testosterone (15). This study examines only men with low bioavailable testosterone. Despite this, they showed a significant positive relationship between bioavailable testosterone and femoral neck BMD. Serum estrogen levels were not good predictors of BMD. This finding stands in distinction to several recent reports (16,17) that suggest serum estrogen levels are better predictors of bone density in men than serum androgens. This finding, as Kenney and colleagues point out, is not consistent (15,18,19).

It is possible, for example, that serum estrogen in older men is an excellent proxy for tissue-available testosterone. The precise relative importance of serum androgens and estrogens and age-related bone loss remain to be clearly worked out. In view of earlier reports of morbidity associated with low-dose estrogen therapy in men (20), however, such therapy would not appear to be very promising in men. It is hard...
to argue with the conclusion that testosterone replacement in hypogonadal men needs to be evaluated as the next step for prevention of hip fracture.

One other major aspect of hip fracture is addressed in this issue—recovery. Magaziner and associates carefully document a series of steps in eight domains in recovery from hip fracture (21). Of some interest is the finding that social activities actually increase post hip fracture, as the authors note, presumably because of interactions between patients and caregivers. Cognition—delirium—in the hospital resolves by 2 months, as does depression, and the patient apparently gets on with recovery. All these steps appear to occur in a relatively constant order and at a reasonably constant rate. The report has significance to physicians in that it allows the physician to ascertain whether an individual patient is progressing at the expected rate. The report also allows a physician to predict when a patient might expect to recover certain functions or interactions after a fracture. The report should provide comfort to a large number of individuals with hip fracture.

A fourth study, by Michel and colleagues, describes who is likely to recover how much function (22). Again, this study provides important information to practicing physicians. It identifies individuals who are likely to recover well, permitting the physician to reassure such individuals and actively pursue remedial interventions, if necessary. On the other hand, the report identifies groups of individuals who are not likely to do well. Again, this is useful to the physician, allowing him or her, in consultation with the family or other caregivers, to predict and plan for outcomes. Similarly, they can determine how strenuously to intervene.

Hip fracture is a major cause of morbidity and mortality in older persons. The four articles in this issue address major clinical issues vis-à-vis (i) the putative role of testosterone in the loss of bone in men, (ii) the effect of weighted vest exercise on osteoporosis, and (iii) the predictors and one in the loss of bone in men, (ii) the effect of weighted vest use in ambulatory older adults: strength, performance, and quality of life outcomes. J Am Geriatr Soc. 2000;48:305–311.


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