LETTER TO THE EDITOR

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Comment on: Prevalence of bone mineral density testing and osteoporosis management following low- and high-energy fractures

To The Editor,

We read with great interest the article by Angthong et al.[1] titled *"Prevalence of bone mineral density testing and osteoporosis management following low- and high-energy fractures"* in the 5th issue of your journal in 2013. We congratulate the authors for this study. However, there are a few issues that we would like to elaborate upon. We would like to draw the attention of the authors and readers to the following:

1. The authors enrolled subjects over 45 years of age in their study, irrespective of their sex. However, it is a well understood fact that post-menopausal women (>45 years) would be more prone to osteoporosis than men of the same age.[2] Although both men and women start loosing bone mass beyond the age of 35, the rate of bone loss increases significantly in women post-menopause. Men, however, reach that rate of bone loss only at an older age.[3] Therefore, females above 45 years of age included in the study can be expected to be more osteoporotic than the men in the same age group. Hence, including subjects above 45 years irrespective of sex would have significantly influenced the study, particularly with two-thirds of their low-energy fracture group being females.

2. The authors have also considered DEXA (dual energy X-ray absorptiometry) 6 to 12 weeks post discharge as an indication of osteoporosis at time of trauma irrespective of the mode of treatment as well as the post-operative rehabilitation protocol. However, patients who have been denied weight-bearing post-surgery would show more bone loss as opposed to those who have been allowed partial or complete weight-bearing in their post-surgery rehabilitation.[4] Disuse osteoporosis may thus bias the inferences in the group not allowed to bear weight.

3. Presence of comorbidities also influence bone mass. Chronic renal and liver pathologies and various endocrinological disorders are known to cause osteoporosis. Intake of drugs like phenytoin, heparin and immunosuppressive drugs corticosteroids are known to cause osteoporosis, as are alcohol intake and smoking. The authors should have established some exclusion criteria before choosing their study group so as to exclude any confounding factors and make sample population more homogenous.[5]

4. The study also seems to have been biased by the heterogeneous study groups. The author has studied just six patients in the high-energy fracture group, whereas 259 patients were analyzed in the low-energy fracture group. The results, thus, obtained are not comparable as the sample size of the two groups is largely unbalanced.

5. The choice of implant also considerably contributes to bone mass. After internal fixation with a plate, a load-bearing device, the patient can not be allowed early weight-bearing and stress-shielding that occur under the plate. At the same time, internal fixation with a nail, a load-sharing device, allows early weight-bearing and there is no stress shielding, thus chances of ebbing of bone mass are reduced.[6] This factor should have been taken into consideration as well.

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Authors' reply

Thank you for your interest in our paper titled, *"Prevalence of bone mineral density testing and osteoporosis management following low- and high-energy fractures"*.[1] Low-energy fractures are commonly associated with osteopenia and osteoporosis. Recently, however, a higher incidence of osteoporosis associated with high-energy factures has been reported in middle-aged and elderly patients[2,3] who are increasingly adopting a more active lifestyle. Thus, the clinical guideline[4] we follow recommends that patients with low- or high-energy fractures undergo dual-energy X-ray absorptiometry (DXA) if they meet at least one of the following criteria; (1) age ≥65 years (women) or ≥70 years (men); or (2) age <65 years (women) or <70 years (men) with the following conditions: menopause started before the age of 45 years, prolonged glucocorticoid intake, postmenopausal with body mass index <19 kg/mm^2, plain radiographic evidence of osteopenia and/or vertebral deformity and decreasing body height.

The guideline recommends that anyone with a low-energy fracture of any part of the body (e.g. hip, vertebrae, tibia, fibula, elbow, patella, ankle, proximal humerus, or the calcaneus[5]) undergo DXA examination[4] because these fractures are considered osteoporosis-related.[5] We believed that the low rate of DXA testing was caused by inadequate awareness of the possibility of osteoporosis regarding the guideline[4] or a lack of access to updated evidence-based medicine.[2,3]

The small number of high-energy fractures limited the power of our study, but it did not preclude the possibility of osteopenia or osteoporosis in patients with high-energy fractures. The conclusion regarding this point needs to be studied further with a larger patient population.

Although DXA testing seems not to be a prerequisite in patients with low-energy fractures, it is a major diagnostic tool for addressing osteoporosis.[4] DXA is the test of choice to assess fracture risk for women ≥65 years and men ≥70 years.[6] There are still gaps in care between the fracture and the diagnosis/treatment of osteoporosis. Improved communication between orthopedic surgeons, specialists, and involved physicians with respect to the updates of evidence-based medicine may help reduce that gap.

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