Letter to the Editor

Qualitative ultrasonography for bone health: Are we there yet?

Dear Sir,

I read with extreme interest the article titled “Osteoporosis among household women: A growing but neglected phenomenon” by Hiremath et al. published in *Med J Armed Forces India* Jan 2018; 74:5–10 and highlighting the issue of bone health among this cohort of individuals.¹

Osteoporosis is characterized by low bone mass, micro-architectural disruption, and increased skeletal fragility. The diagnosis of osteoporosis is made by either the presence of a fragility fracture or a T-score of –2.5 or less as defined by WHO.² WHO T-score range of –2.5 or less identifies approximately 30% of postmenopausal women as having osteoporosis, which also approximates the average lifetime risk of osteoporotic fractures clinically at spine, hip and forearm. This classification of BMD was established using central Dual-energy X-ray Absorptiometry (DXA) technologies at these specific skeletal sites with a female postmenopausal Caucasian reference database. The term osteoporosis should therefore not be used in premenopausal women which were the constituent of the author's cohort. In this group a Z score should be used where a Z score of –2.0 or less is defined as “bone density below the expected range of age” and not “Osteoporosis”.

The authors have used the term 'Osteoporosis' and 'Osteopenia' in conjunction with the result of the Qualitative ultrasonography (QUS) at the heel. QUS cannot be used for diagnosis of Osteoporosis or Osteopenia.^{3,4} The QUS is a modality for screening patients with high risk or low risk of fracture in conjunction with the clinical risk assessment. The risk obtained from the values of QUS is independent of the central BMD measurement and hence the diagnosis of osteoporosis. QUS moreover has been validated only for predicting fragility fracture in post-menopausal women and not for pre-menopausal women. In the absence of central DXA or if central DXA cannot be done, treatment can be initiated if the fracture probability assessed by heel QUS is high. However, device and population specific threshold should be used in this case. Furthermore, QUS cannot be used for monitoring the treatment response to anti-resorptive or anabolic therapy for osteoporosis.

To summarize QUS can be used for predicting increased risk of fracture in postmenopausal women and in certain clinical settings helps in therapeutic decisions. However, it

cannot be used for the diagnosis of 'osteoporosis' or 'osteopenia' and monitoring therapeutic response.

In view of the above this particular study at best gives us an indication that there is an increased risk of fracture among this cohort of patient and there is a need for educating the target population regarding bone health and preventive measures. However, based on the data of QUS alone, it is premature to draw conclusion of increased osteoporosis or low bone mass in this cohort.

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Reply

Dear Editor,

We thank the readers for taking keen interest in the article. The clarifications are as under:

Diagnosis of osteoporosis is established by measurement of BMD or by the occurrence of adulthood hip or vertebral fracture in the absence of major trauma. In premenopausal women, men less than 50 years of age, and children, the diagnosis of osteoporosis is not made on the basis of densitometric criteria alone. However in post-menopausal women and men age 50 and older WHO diagnostic T-score criteria for BMD at spine, hip or forearm are applied.¹

Dual emission X-ray absorptiometry (DXA) remains the gold standard test for the diagnosis and quantification of osteoporosis, however its use in public health settings is limited by access, technological expertise, cost and availability.

Quantitative ultrasound (QUS) provides a viable alternative and studies suggest evaluation performed by QUS may be equally predictive of risk of future fractures.^{2,3} However, at present there are no consensus on use of QUS for diagnosis of the osteoporosis.^{1,4} The same has been mentioned in the article as one of the limitation of the study and discussed.⁵

We agree with the conclusion drawn by the reader that “this particular study at best gives us an indication that there is an increased risk of fracture among this cohort of patient and there is a need for educating the target population regarding bone health and preventive measures. However, based on the data of QUS alone, it is premature to draw conclusion of increased osteoporosis or low bone mass in this cohort” (sic).

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