

Letters to the Editor

An age- and sex-controlled matched pair analysis of T scores in ethnic Indians with hip fractures

To the Editor:

We read with interest the article titled 'An age- and sex-controlled matched pair analysis of T scores in ethnic Indians with hip fractures' by Vaidya et al¹ in the *Journal of Orthopaedic Surgery*.

Although the study revealed some interesting findings, there are several methodological drawbacks that we would like to point out:

1. The sample contained patients with a wide age range, with 5 patients under the age of 50 years. It is important to ascertain whether the fractures were sustained after a trivial fall (fragility fractures) or after a significant injury. Furthermore, the preponderance of male patients is somewhat at odds with worldwide figures for incident hip fracture. How representative of fracture cases was the random sample?
2. The authors mentioned that they preferred expressing the T scores to the absolute bone mineral density (BMD) values as no normative reference data on the use of dual energy X-ray absorptiometry (DXA) in the Indian population are available. Does this justify the use of the Caucasian reference data to get the T score? It is well recognised that the use of a database other than the local norm can lead to over- or under-reporting of osteoporosis. It is agreed that different devices provide slightly different BMD estimates but the expression of BMD as absolute values in

the given context would be more important than providing the T scores.

3. The authors conclude on the basis of their data that T scores in the Indian population can be used to predict hip fracture. The study design can best be described as a case-control study and no patients have been followed from baseline till sustaining a fracture. Hence the conclusion that T scores are the best predictor of fracture is premature. At best it can be said that in the given sample, T scores were able to discriminate between patients with and without hip fracture. The authors did not comment on 2 other important predictors of fracture risk (weight and prior fracture), which may have contributed to some of the differences between the cases and controls. Such analyses would certainly be required before concluding that T scores are the best predictor.

We would like to have the authors' thoughts on the above issues.

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REFERENCE

1. Vaidya SV, Dholakia D, Yadav S. An age- and sex-controlled matched pair analysis of T scores in ethnic Indians with hip fractures. *J Orthop Surg* (Hong Kong) 2003;11:22-7.

Authors' reply

1. We were aware of the age of the 5 patients. All the patients had fragility fractures, and exhaustive and detailed evaluation, including endocrinal work-up, was performed to rule out any secondary cause of osteoporosis. What was remarkable about the 2 females in this group was that they were not physically active. They also complained of feeling generally unwell during their growth spurt. This suggested the possibility of peak bone mass being dependent upon the calcium intake and physical activity levels during puberty. However this association could not be confirmed in our study even though exhaustive evaluation had been undertaken to rule out any existing illness or endocrinal abnormality. To address the second part of the question, it should be highlighted that these were not continuous patients or those of a series. Rather, these patients were selected randomly on the basis of inclusion and exclusion criteria following preliminary work-up or detailed evaluation as required. The fact that these were otherwise healthy patients without any other major illness as per the criteria suggests an accurate representation of the cohort of osteoporosis patients in the general population. Furthermore, male senile osteoporosis has a higher incidence of fractures especially in the older decades, and in our study, the incidence was higher in those in their 8th decade compared with females in their 7th decade, which is also a known fact.
2. As we have mentioned, T scores are standardised because they are expressed with respect to the peak bone mass. This has been established in numerous studies including those of the WHO. Also in the absence of any Indian values, standardisation by a single machine of bone mass density is not possible. The best alternative under these circumstances is to express BMD in the form of a statistical tool available (T score) rather than as an absolute value—BMD. This is also true for

Caucasian standards where it is expressed in terms of standard deviation not only for the affected group but also for the normal group. So in effect we are calculating not an absolute entity but the standard deviation or T scores that can be used for comparison between normal and affected groups. The general consensus in the 4th Annual Conference on Osteoporosis is that in the absence of standardised data for a population (as is the case for absolute values in peak BMD for the Indian population), other standardised values (Caucasian) may be used to calculate the severity of osteoporosis.

3. None of the patients in the study had prior fracture or were obese. This was evaluated as per the inclusion and exclusion criteria, which we have mentioned. There are many physical predictors of hip fracture, including weight, previous fracture(s), gait prior to fall, severity of fall, and the status of the knee. However, these elements fall outside the purview of our study, which aimed to establish whether osteoporosis as defined using T-scores was of any significance and whether it represented true osteoporosis with respect to hip fractures. The comment regarding T scores being able to discriminate between patients with and without hip fractures only in the given sample is the same as our findings, which showed T scores serve as a statistically significant tool in discriminating between normal people and patients with fractures. Given our study was a prospective one that achieved its objective by confirming the usefulness of T scores to confirm osteoporosis in the Indian population, how right would it be ethically to continue without therapy just to ascertain the yield point of fracture?

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