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Letters to the Editor

Heterotopic ossification of the hip and bone densitometry

With regard to the article 'Influence of heterotopic ossification of the hip on bone densitometry: a study in spinal cord injured patients' by S Jaovisidha *et al*.[1] it is suggested that measurement of bone mineral density in hips should be avoided in cases where there is heterotopic ossification (HO) because of false elevated results. But this is already known by using Dual-Photon Absorptiometry.[2] When using the Dual X-ray Absorptiometry (DXA) technique for measuring bone mineral density in cases where HO is predictable it is standard practice to select another region of the body for DXA measurement[3–5] in order to avoid the false positive measurement which would result from measuring the HO affected region. The article states that subjects involved in the study showed 'no clinically obvious indications of HO in the hips'. But such indications are always clinically obvious in patients with advanced HO, as in Figures 1–3 in the article. Even in less advanced cases, when clinical evaluation for HO is in doubt, the standard practice in order to diagnose HO is first to take an isotope bone scan[6] and, if it is positive, then a conventional X-ray which will give a clear picture, in particular the extent of the HO and its relation to the joint. In other words, DXA measurements, especially in the hips, should never be used as a first step for spinal cord injury patients because of the high incidence of HO[7]. Even in cases when DXA is used before the conventional radiography, the high resolution DXA scanners will provide a clear image of the anatomic details before measurement of bone density is started,[8] thus rendering such measurement unnecessary if HO has been identified.

In cases where both hips are affected by HO the bone density can be measured by Quantitative CT[3,5,8] or another suitable region of the body chosen by DXA measurement in order to avoid the risk of false elevated results.[2]

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In reply to Dr Papadaki and colleagues

With regards to the letter from Dr Papdaki and colleagues concerning our article,[1] we would like to address certain points.

We agree with Dr Papadaki and colleagues that it has been known that heterotopic ossification (HO) at the hip can cause falsely elevated bone densitometric values.[2] But, to our knowledge, we did not find any quantitative study stating 'how much error or how much false elevation HO can cause.' That was why we conducted this study using substantial numbers of patients to determine the magnitude of influence of HO on results, and found that HO can cause false elevation ranging from 29–101% for bone mineral content (BMC), 21% for bone mineral density (BMD), and 39–43% for percentage of BMD compared to age-matched controls.[1]

The second explanation is criteria of 'clinically obvious HO' used in our study. The clinically obvious HO has to do with subjects having fracture before, or they had been noticed due to debridement, or deformities in the hip that indicated HO was present. When the subjects did not have any of these criteria, they were included in the study. After DEXA scan was performed, we observed the irregularity about the hip in some subjects i.e., subjects in Figures 1–3, and plain radiographs were obtained later. We agree that in the cases with spinal cord injury or with high risk of HO, the hip should be avoided for bone densitometric determination.

We agree that the isotope bone scan is more sensitive than plain radiograph for detecting HO.[3–7] But, as we stated in the Discussion of our article[1] that, whether the positive bone scintigram without radiographically demonstrable HO influences bone densitometric values is not yet known; we therefore used plain radiograph for determining HO in our study.

We would like to emphasize that the main purpose of our study was to do a quantitative study regarding how much error HO can cause to the densitometric results. We found that in some cases with extensive HO of the hip, the BMD was low compared to age-matched controls. This evidence

suggested that even with low BMD value, the fracture risk is still underestimated and is actually higher.

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