Bone mineral density in the distal radius and increased risk of fractures in haemodialysis

Sir,

We read with great interest the recent article by Urena et al. [1], which correlated the markedly decreased Z-score in the mid-radius with subsequent development of fractures. As opposed to the prevalent use of BMD, T-scores of \(< -2.5\) to define osteoporosis [2], the Z-score is commonly used to identify the number of standard deviations for the mean of a healthy, age and gender-matched normal population and may be a better indicator for identification of osteoporosis in patients receiving steroids, post-transplant and those with chronic diseases.

Quite controversial is the preferred site for measurement of bone density. It is commonly felt that the risk of fracture at a particular site is dependent on the BMD at that site [3]. Most authorities recommend the measurement of BMD at the spine and hip as fractures in these areas have the most adverse effects on the individual’s health. However, recent studies have revealed that forearm fractures are more important indicators of subsequent osteoporotic fractures at the hip (\( \times 2.7\)-fold in men, \( \times 1.6\)-fold in woman) [4]. Following a forearm fracture, the cumulative incidence of any fracture was 55% at 10 years and 80% by 20 years [4]. However, strangely enough, this fact is under-recognized and only 17% receive any form of pharmacological osteoporosis intervention within a year of sustaining a distal forearm fracture and visiting their physicians for a non-orthopaedic complication [5]. The current study illustrates that the forearm Z-score is markedly decreased in haemodialysis patients. Though not clearly demonstrated in this study, extrapolation of information from population studies of osteoporotic fractures, BMD density in the distal radius in the first quartile could increase their risks for future hip fractures to \(\sim 8/1000\) patient years [6].

The role of biochemical markers of bone turnover is often indicated when the BMD is in the middle tertile, and any value above the upper limits of normal in pre-menopausal women is often an indicator to consider pharmacological treatment [7].

The current study highlights an often ignored site of bone mineral loss, i.e. the distal radius, and the increased propensity for fracture despite a normal BMD score at the hip and spine.

Conflict of interest statement. None declared.

Reply

Sir,

We would like to thank Ghosh for his interesting comment to our article [1]. Indeed, 80% of our patients had osteoporosis when taking into account the T-score at the mid-radius. Moreover, as previously reported, the 30% prevalence, since the onset of haemodialysis (HD) treatment, of symptomatic skeletal fractures in this population of HD patients is extremely high. Unfortunately, we cannot completely agree with his first comment as we could not see any difference in the Z-score at the mid-radius between patients with or without fracture, most certainly because the majority of these patients already had a reduced Z-score at this particular site. Only the Z-score at the total body, which also mostly represents cortical bone, was significantly lower in patients with fractures.

However, after reviewing the data again, we have found that the number of patients sustaining fractures was significantly greater when the Z-score at the mid-radius was lower than \(-2.5\) (11/21) than when the total body Z-score was lower than \(-2.5\) (2/21) (Figure 1). In conclusion, as in patients with normal renal function, low bone density at the mid-radius appears to be associated with peripheral fractures. However, for unexplained reasons, the Z-score at the total body better discriminates patients with fractures in the present small cohort of HD patients.

Conflict of interest statement. None declared.