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Correspondence

Changes in markers of bone turnover during treatment of hyperthyroidism

Sir,

I read with great interest the article by Jyotsna *et al*[1]. They undertook a study to measure the bone mineral density (BMD) in patients with Graves disease in Indian population which is predominantly vitamin D deficient and to assess the changes in BMD after the patients became and remained euthyroid following treatment. BMD was found to be significantly lower at hip, spine and fore arm compared to healthy, euthyroid controls. When treated for hyperthyroidism, the absolute BMD improved at all sites. But the BMD corrected for body mass index showed a decrease which stabilized after one year. The authors concluded that damage in BMD caused by thyroid hormone excess was not corrected even after two years of patients being euthyroid[1].

Biochemical markers that reflect remodelling or turnover of bone can be measured in urine or blood including resorption markers and formation markers. Resorption markers include tartrate resistant acid phosphatase and bone matrix degradation products like hydroxyproline, pyridinium cross-links, and telopeptides[2]. Bone formation markers include alkaline phosphatase enzyme, and three products of bone matrix synthesis which are osteocalcin, amino- and carboxy-terminal procollagen l extension peptide[3].

Thyroid hormones affect bone cells both *in vitro* and *in vivo* by stimulating osteoblast and osteoclast cells with more bone resorption and increased skeletal remodelling. It was reported that bone resorption markers, such as urinary pyridinoline and deoxypyridinoline, were increased 7-8 times in hyperthyroidism than age and sex matched controls[4]. On the other hand, levels of bone formation markers increased to a less degree suggesting the imbalance between bone formation and resorption with subsequent bone loss in hyperthyroidism[4,5]. It was shown that the increased levels of markers of bone turnover declined during antithyroid treatment[4].

It is felt that measurement of several bone formation and resorption markers in addition to serum calcium and alkaline phosphatase could have been an original contribution to the design of the present study under the light of the pertinent data in the literature.

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