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REVIEW

Bone quality in endocrine diseases: determinants and clinical relevance

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Abstract

Purpose Bone is one of the main targets of hormones and endocrine diseases are frequent causes of secondary osteoporosis and fractures in real-world clinical practice. However, diagnosis of skeletal fragility and prediction of fractures in this setting could be a challenge, since the skeletal alterations induced by endocrine disorders are not generally captured by dual-energy X-ray absorptiometry (DXA) measurement of bone mineral density (BMD), that is the gold standard for diagnosis of osteoporosis in the general population. The aim of this paper is to review the existing evidence related to bone quality features in endocrine diseases, proposing assessment with new techniques in the future.

Methods A comprehensive search within electronic databases was performed to collect reports of bone quality in primary hyperparathyroidism, hypoparathyroidism, hyperthyroidism, hypercortisolism, growth hormone deficiency, acromegaly, male hypogonadism and diabetes mellitus.

Results Using invasive and non-invasive techniques, such as high-resolution peripheral quantitative computed tomography or DXA measurement of trabecular bone score (TBS), several studies consistently reported altered bone quality as predominant determinant of fragility fractures in subjects affected by chronic endocrine disorders.

Conclusions Assessment of skeletal fragility in endocrine diseases might take advantage from the use of techniques to detect perturbation in bone architecture with the aim of best identifying patients at high risk of fractures.

Keywords Bone quality · Hormones · Bone structure · Hyperparathyroidism · Diabetes · Hyperthyroidism · Cushing syndrome · Acromegaly · Growth hormone deficiency · Hypogonadism · TBS REMS

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