

Understanding bone fragility: theoretical explanation to non-physician health professionals

The European League Against Rheumatism recently established timely and highly important recommendation for non-physician health professionals regarding the prevention and management of bone fractures among older adults.¹ To support the health professionals' understanding of skeletal fragility, I would like to provide a theoretical explanation.^{2,3}

First, non-physician health professionals are expected to play a role in the improvement of patient adherence to pharmacotherapy for osteoporosis.¹ Here, it should be paid attention that the effects of osteoporosis drugs except bisphosphonates with mineral binding capacity are lost rapidly after discontinuation,⁴ which can be reasonably explained by functional adaptation of bone to mechanical loading during physical activity.³ Second, the homeostatic system in the skeleton² can also explain why the small and transient effect of calcium supplementation on areal bone mineral density, measured by dual-energy X-ray absorptiometry, is lost after discontinuation.⁵ Finally, although vigorous-intensity exercise would improve bone fragility,⁶ the effect can be similarly lost after discontinuation, resulting from the skeletal adaptation to mechanical environment.⁷ Long-term continuation of exercise should be therefore given priority over the intensity; for example, rapid bone loss following stroke⁸ indicates the significance of even light-intensity physical activity.

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