Rafael Contreras Chávez *
Marisol Contreras Chávez**
*Universidad Michoacana de San Nicolás de Hidalgo
**Instituto Mexicano del Seguro Social (IMSS)

Resilient bones: osteoporosis vs. misinformation

On digital platforms, it's common to come across fake news that oversimplifies how the human body works or promotes miracle products. To combat lack of knowledge, it's important to understand the anatomical and chemical complexity of our skeleton.

Our bones are made up of compact bone—that is, a hard-outer layer that bears the main mechanical loads—and cancellous (trabecular) bone, an internal network-like structure that houses the bone marrow; and the bone marrow and vascular network, soft tissue filled with blood vessels responsible for the nutrition and vitality of the bone, composed of water, minerals (phosphate and calcium), as well as organic matter—primarily collagen—which gives it flexibility.

But what makes bones strong? While collagen provides a flexible foundation, calcium hardens and stiffens this material. Calcium and phosphorus crystallize within bone tissue to form hydroxyapatite. Together, they are deposited microscopically between the collagen fibers, giving the bone a resistence comparable to that of concrete.

Medical misinformation ignores the balance in "bone remodeling," a process involving two important types of cells: osteoclasts, which destroy, "eat," or resorb aged bone; and osteoblasts, which build and "regenerate" the new bone matrix. No "natural supplement" promoted on digital platforms can reverse bone damage unless actual risk factors are addressed.

The silent disease on digital platforms

The barrage of unregulated information on social media has reinforced false beliefs about bone health. Debunking this information with scientific evidence is essential for health:

- **Myth 1:** "Osteoporosis causes chronic bone pain"
- **Reality:** Osteoporosis reduces the thickness and strength of bone tissue, making it dangerously fragile. However, it is an asymptomatic process. Pain appears only when until the bone collapses and a visible or imperceptible fracture occurs. People seeking relief from common joint or muscle pain delay diagnosis by turning fraudulent supplements.
- **Myth 2:** "Alkaline' or detox diets cure osteoporosis by balancing pH"
- **Reality:** Blood pH is regulated by renal and respiratory mechanisms. When calcium intake is insufficient, the body activates bone resorption to release calcium ions into the blood and maintain functions such as cardiac rhythm. Following restrictive diets without clinical evidence worsens nutrient deficiencies, forcing the body to dissolve its own hydroxyapatite crystals to compensate.

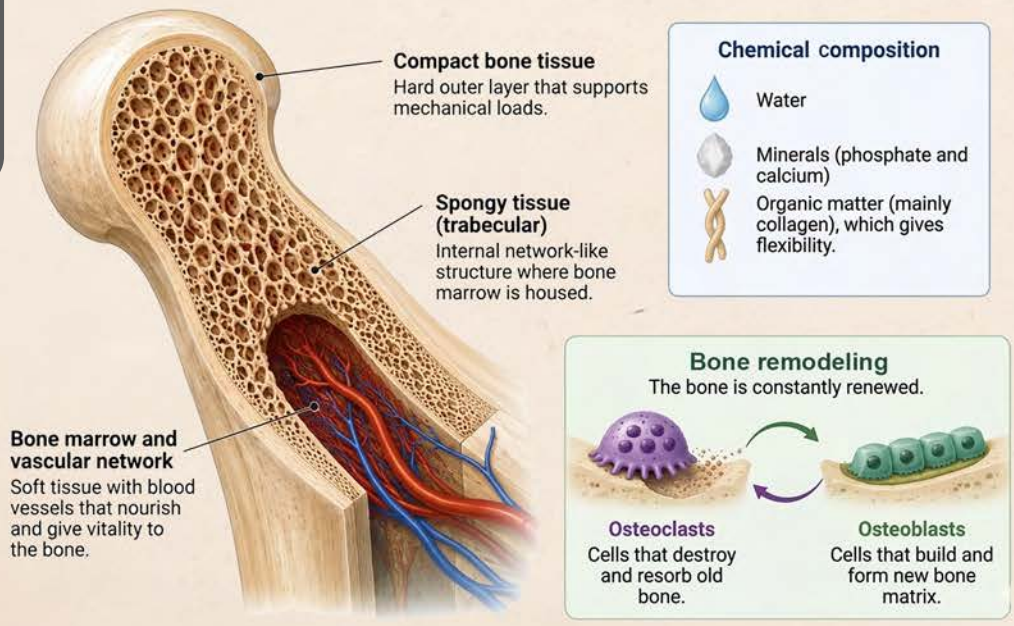

Figure 1. Bone is a living tissue; its strength depends on the interaction between its components and the minerals (calcium and phosphate) that form hydroxyapatite crystals. Bone remodeling maintains this balance through osteoclasts and osteoblasts. Source: Author's own work.

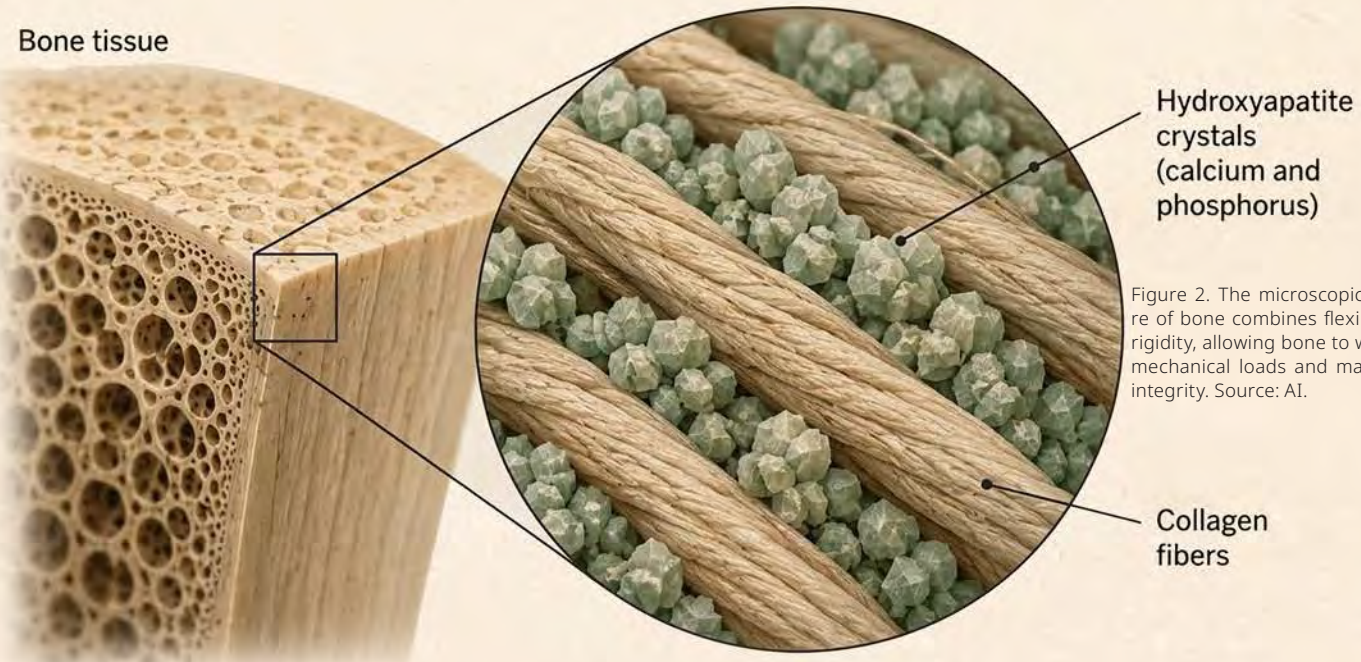

Figure 2. The microscopic structure of bone combines flexibility and rigidity, allowing bone to withstand mechanical loads and maintain its integrity. Source: AI.

- **Myth 3:** "Dairy products are harmful, and 'herbal' supplements rebuild bone faster"
- **Reality:** New bone formation depends on the constant activity of osteoblasts, which require a sustained supply of calcium, phosphorus, and vitamin D. Eliminating major sources of calcium without the supervision of a doctor or nutritionist compromises the materials needed for mineralization, weakening the bone.
- **Myth 4:** "It's a disease exclusive to older women, so there's no need to worry about it before then"
- **Reality:** While the decline in estrogen during menopause accelerates bone loss in women, osteoporosis also affects men. "Peak bone mass" is reached in the first decades of life. Physical inactivity, smoking, and alcohol consumption during youth determine how well bones withstand the natural decline associated with aging.

Replacing science-based medicine with "natural" remedies or "magical" supplements for osteoporosis puts your bones at risk. From a clinical and biochemical perspective, calcium fixation depends on strict physiological processes, not on "quantum" solutions, magnets, or herbal infusions. That is why prevention through nutrition, exercise, and bone densitometry is crucial for avoiding fractures. For safe and scientifically sound management of osteoporosis, consult your doctor and refer to official sources such as the Mexican Association of Bone and Mineral Metabolism (AMMOM).

References

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Figure 3. Misinformation spread on digital platforms can promote erroneous beliefs about osteoporosis and its treatments. Scientific evidence distinguishes between unfounded recommendations and actual strategies for the prevention, diagnosis, and care of bone tissue. Source: AI.