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Editorial

Osteoporosis: The other interventions[☆]

Osteoporosis: Las otras intervenciones

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There is increased life expectancy worldwide, and the impact of osteoporosis and associated fractures is notably increasing, even in Latin America.^{1,2} Practically all clinicians share similar views on the diagnostic (osteodensitometry) and therapeutic (antiresorptive drugs or bone formers) interventions. There are considerable evidence-based reviews and management guidelines regarding these interventions.^{3–8} They define who should be treated or undergo further studies, and all urge changes to certain lifestyle habits, such as smoking or excess alcohol consumption. All these guidelines recommend an adequate intake of calcium and vitamin D, and weight-bearing exercise. However, in daily practice, too many patients under treatment for osteoporosis do not receive calcium and vitamin D supplements, and the prescription for increased physical activity goes no further than a vague instruction to “take exercise”.

The WHO working definition of osteoporosis (a T-score based on osteodensitometry below -2.59) was a valuable step towards defining the epidemiology of the disease.⁹ This limit has even been used to define who should be treated, which is correct, but does not take into account that many fractures occur in patients above this limit, indicating the need to define bone fragility in a different way.¹⁰ Today it is agreed that those requiring treatment are: a) people with a minimal trauma fracture, particularly of the hip; b) People with an osteodensitometry-based T-score of -2.5 of the femur, spine or forearm, and c) people with low bone mass, above this limit, with risk fractures defined by FRAX identifying those at elevated absolute risk for fracture for the thresholds of each country. This defines what is currently considered “osteoporosis” and who should be treated.¹¹ This concept is included in the management guidelines cited.^{3–8} Three additional diagnos-

tic interventions can improve certainties in identifying those who should be treated: 1) A systematic search of vertebral fractures. Their high prevalence¹² and the fact that they are usually asymptomatic, require lateral spinal radiographies or assessment of the vertebral fracture using an osteodensitometer.¹³ Finding a fracture will reclassify the individual's risk. 2) A search for causes of secondary osteoporosis. These are relatively frequent; it identifies relevant disorders (such as hyperparathyroidism) that can interfere in the response to treatment.¹⁴ This search only requires a clinical history and accessible laboratory tests. 3) A screening strategy to identify people most likely to have osteoporosis. There is limited access to osteodensitometry in many regions¹⁵ and certain tactics can fine-tune the decision as to who should be studied. Some authors have proposed the FRAX, a tool to evaluate absolute risk for fracture, but which, by identifying the most vulnerable, determines “thresholds” that define the individuals who should be treated and those who require further studies.^{16,17} There are various screening tools to decide the individuals at most risk of osteoporosis.¹⁸ Of these, OsteoRisk, validated in Latin America, comprising only age and weight, identifies people with low bone mass.¹⁹ It is easy to use, shows close correlation with more complex tools such as FRAX,²⁰ and has no cost.

It is essential to administer calcium and vitamin D for every individual with a deficiency in these nutrients and those receiving therapy with drugs against osteoporosis.^{3–8} Adherence to this widely accepted intervention is poor in 50%-70% of individuals.^{21,22} Adequate calcium intake (from 1000 mg to 1200 mg/day) is required for bone health throughout life. This should ideally be from dietary sources, which can be complemented with supplements to ensure this intake.²³ Controversy about possible cardiovascular consequences with calcium supplements,²⁴ has meant that some doctors and patients avoid them. However, many studies have demonstrated that calcium supplements in appropriate doses do not increase the risk of cardiovascular disorders.^{25,26} It is advisable not to exceed a total daily intake of 1500 mg calcium, including diet and supplements.⁵ Other risks such as nephrolithiasis – dis-

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cretely increased – can be prevented by monitoring hypercalciuria in susceptible individuals. Dyspepsia can be alleviated by changing calcium carbonate for calcium citrate.⁵

Appropriate protein intake (.8 to 1.5 g/Kg of body weight/day) through the diet is essential for healthy bones and muscles.²³ People of advanced age who consume more than .8 g/Kg of protein per day, have greater bone density, less bone loss, and lower risk of hip fracture.^{23,27} Malnutrition is common in people of advanced age in Mexico, and increases with age.²⁸ In people suffering hip fracture, protein deficiency causes adverse outcomes and higher mortality.²⁹ Protein supplementation improves malnutrition markers such as prealbumin and IGF-I and IgM levels. This apparent structural and immune improvement could explain the reduction in unfavourable outcomes and deaths.^{23,27,29,30} Elderly people are advised to take a daily 1.0 to 1.2 g/protein per kg of body weight.²³ Dairy products provide more calcium and protein per calorie than any other food.²³ A 200 ml glass of milk, a 180 g portion of yoghurt or 30 g of hard cheese provide 250 mg of calcium. The minimum daily requirement can be met with 3 or 4 portions. A litre of milk provides around 35 g of protein. Several studies have demonstrated that dairy products have positive effects on the biochemical and hormonal markers of bone remodelling, and a synergic effect with physical activity to improve bone structure and strength.^{23,31} A diet rich in dairy products can provide some protection against hip fracture.²³ Increasing the consumption of dairy products could be an effective health strategy to reduce the impact of fractures.^{23,31,32} Given the concern that dairy products can increase lipids and affect cardiovascular risk, a report on 136,384 subjects aged from 35 to 70 from 21 countries is reassuring. The report found that consumption of dairy products was associated with a lower risk of mortality and major cardiovascular events.³³ And there are now alternatives available for people who are lactose intolerant.

Physical activity and exercise are interventions that can favourably change the outcomes of many chronic/degenerative diseases, and it is essential that they are actively promoted worldwide.³⁴ Exercise produces modest gains in bone density; a discrete reduction in new fractures, and a clear reduction in the number of falls.^{35–37} The benefits of physical activity and exercise are acknowledged by the public at risk³⁸ and doctors and health professionals.^{39,40} However, their perception is that their interventions lack sufficient impact on the population, which they attribute to insufficient training in this field and various aspects relating to the time available for patient care. There are several guidelines for increasing physical activity and exercise with a view to improving health in general^{41,42} as well as bone and muscle health. These are specific to the practice of safe and effective exercise and include a) progressive resistance training; b) impact and weight-bearing exercises and c) balance and mobility training.^{43–45} The frequency and intensity of these activities will depend on the factors of each individual: bone health, comorbidities, functional status and clinical risk factors for fall and fracture.⁴³

Diagnosis screening interventions can improve the selection of individuals to be studied with the limited resource of osteodensitometry. An active search for vertebral fractures and causes of secondary osteoporosis will enable the risk of some individuals to be reclassified. Efforts in research and clinical practice have focused on the diagnosis and pharmacological treatment of osteoporosis, but general primary prevention measures based on modifiable risk factors should be a health priority to delay the onset of bone loss and skeletal fragility. The professional societies' tasks in this field must include spreading this notion to the health authorities, the medical community and society in general.⁴⁶ These recommendations are far from sufficient for patients at high fracture risk, but there is enough evidence to conclude that nutritional and lifestyle factors can have a positive effect on muscle and bone mass and function, and are reasonably cheap and safe. Ensuring adequate

intake of protein, calcium and vitamin D, in combination with an individualised exercise programme for the susceptible population, will probably help to reduce the impact of osteoporosis and fractures. To contribute to this, we must develop the skills to form working teams with nutrition, rehabilitation and physical medicine professionals.⁴⁷

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