

Perspectives on Osteoporosis in Developing Countries: Growing Problem, Dwindling Resources

Jorge Morales-Torres

Cátedra de Reumatología, Facultad de Medicina de León, Universidad de Guanajuato, Clínica de Osteoporosis, Hospital Aranda de la Parra, León-Gto, Mexico

Osteoporosis causes considerable morbidity, mortality and consumption of health resources in industrialized countries. In these, its importance is relatively well known but there is a notable lack of information of its impact in developing countries.¹ Latin America and the Caribbean, the south of Asia, North Africa, the Middle East, and subSaharan Africa are regions in which most of the countries are considered to be “developing.” Table shows some key data regarding these regions during 2006.^{2,3} In subSaharan Africa alone, life expectancy is under 50 years and some studies have shown a significant incidence of hip fractures in the rest of the regions.^{1,4-13} Approximately 5% of the population reaches 65 years of age and between 10% and 15% are older than 50 year of age in most of the regions, although there are great differences between specific countries. The diverse ethnic composition of these regions can influence variations in bone density and lifestyle and, therefore, in the eventual risk of fracture. The access to medical care also varies from one country to another. Although most of these countries have social security and diverse forms of medical insurance, large sectors of the population depend on pay-per service payment modalities with limited or non-existent coverage of the cost for detecting and treating osteoporosis.

Other demographic realities in these regions include a tendency to “urbanization” of the population, with a low rate of alphabetization and an incomplete primary education in many countries. The knowledge and attitudes to health care (including bone health) can be inadequate in a large proportion of the population³ (Table).

There are also enormous differences in the gross national income per capita, as a sample of the economic situation of each region. Health resources for each country usually reflect this reality. The distribution of this income is, however, very unequal, where 10% of the richest population has 60.4% of wealth and the poorest 10% only receives

1.6% of said wealth.³ This inequality is also revealed in the distribution of diagnostic resources. It is estimated that in all of Latin America and the Caribbean there was, in 2007, less than 2800 osteodensitometers for axial use. The recommendation made by the International Osteoporosis Foundation of having at least 10 of these machines per every million persons would demand that the region had at least 5500 densitometers. In addition, most of these are under private management and access to them by the population with little resources can be very limited (Sergio Ragi, 2007, personal communication). The panorama of access to diagnosis is similar or worse in the other regions mentioned above, with enormous zones that include several countries that have no densitometers.

There are few studies regarding resource use for osteoporosis and fractures in developing countries. An estimate of annual treatment costs with biphosphonate, including 2 medical visits and an osteodensitometry in Mexico, with the known prevalence of osteoporosis by densitometric criteria, osteopenia plus 2 risk factors, vertebral fracture and incidence of hip fractures concludes that it would be necessary to use between 0.3% and 0.4% of the gross national product (or close to 6% of the national health budget, including both the private and public sectors) in order to treat women who are within the limits recognized as an indication of medical treatment.¹⁴ Hip fracture usually requires hospital attention and the evaluation of the attention costs can be more accessible than other fractures related to osteoporosis. Some studies have explored the direct costs of treating a hip fracture.^{1,15} The attention estimates for this cost are between 4500 and 6000 dollars. In the most recent study on this topic a mean cost of 4365 dollars was found (range, 1612 to 13 777 dollars) according to the site (public or private) where the patient is treated. There are also differences in these costs between different countries, but these only represent the real impact because these estimates do not include rehabilitation or institutionalization costs incurred by many patients, nor do they contemplate the income lost by family members who dedicate part of their time caring for patients with functional sequelae.

Ideally, decisions should include the notion of absolute risk of hip fracture for 10 years. This risk shows great

Correspondence: Dr. J. Morales-Torres.
Hidalgo 329-704, León 37000, GTO. México.
E-mail: jorgitomorales@prodigy.net.mx

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Key Data of Developing Countries, 2006^a

Region	Population, Millions	Life Expectancy, Years	GNI per Capita, Dollars	Hip Fracture
Latin America and the Caribbean	555.9	73	4767	192.6
North Africa and the Middle East	311	70	2481	143.9
SubSaharan Africa	770.3	47	842	30.6
South of Asia	1492.5	63	766	185.2

^aHip fractures in persons over 50 years per 100 000 inhabitants, mean data from available publications.¹⁴⁻¹³
Population data obtained from The World Bank.³

differences in the different countries in which it has been defined.¹⁶ In Mexico it is considered to be 8.5% in women and 3.8% in men older than 50 years of age.⁴

Faced with this panorama, the design of adaptable prevention and treatment programs for the needs of each region and country seems to be a unpostponable task. It is evident that in the majority of developing countries, the evolution of the demographical composition shows a considerable increase in the life expectancy and this allows the prediction of a considerable rise in the number of older patients, with their peculiar needs from the health system. Information on the incidence and prevalence of osteoporosis associated fractures which is available in many of our countries show numbers similar to those found in developed countries. Resources available for health (for the acute treatment of fractures, their rehabilitation and chronic management, for diagnosis centers and treatment with adequate medication) are limited in most of the countries or are assigned to other health priorities.

Internationally accepted guidelines can be adapted to our realities and can be promoted by organizations of professional and patients, but require the acceptance and the support of health authorities.¹⁷ These steps should include:

- Campaigns that promote attention on osteoporosis and its consequences on the at-risk population and health professionals. These campaigns must have a positive and “propositive” nature, based on solid scientific basis and far away from any kind of commercial aspect. These types of campaigns should include: the promotion of a healthy lifestyle in the general population, emphasizing the aspects that contribute to bone health. The urgent aspect of children and adolescents meriting a diet which is rich in calcium sources and physical activity, capable of building an adequate peak bone mass must be mentioned. In addition, these measures can be applied to adults who wish to preserve their bone mass, insisting on the need to eliminate their exposure to substances which are toxic to the bone, such as tobacco, alcohol abuse and certain drugs
- The development of national or regional evidence-based guidelines, for the diagnosis and treatment of osteoporosis, which are susceptible of evaluation through auditing.

Professional societies must contribute to said development and is necessary in order to pave the way for its diffusion among health professional

- The development and implementation of fracture treatment guidelines, their rehabilitation, and the prevention of falls
- The collection of data on the economic impact of osteoporosis and associated fractures
- The development of national fracture registries that allow us to understand the progression of this phenomenon in the population

This steps can contribute in reducing the growing impact of osteoporotic fractures. Its implementation requires solid scientific basis and the compromise by those in charge of health policy, the health professionals, patient organizations and eventually, the general population.¹⁷

However, the clinician that deals with individual patients at risk for osteoporosis and fragility fractures must make decisions even in those cases in which resources for their attention are limited. The decision to ask for an osteodensitometry can be refined through the use of one of the proposed indexes that identify study subjects, such as OsteoRisk (also known as OST and OSTA), that includes only age and weight and that may identify in a trustworthy manner those with a low bone mass.¹⁸ There is also good information on the importance of independent risk factors that allow the identification of those with a higher risk of hip fracture, apart from the results of osteodensitometry. These are: advanced age, body mass index under 19, a personal history of fractured before 50, a history of steroid consumption, a history of fractures in first-degree family members, diseases related to osteoporosis and fractures, and abuse in the consumption of alcohol. According to these, it would be possible to treat persons who presented a higher risk, even before they have an osteodensitometry.¹⁹

Once the need for treating a patient has been defined, a secondary cause of osteoporosis must be reasonably excluded, which can be done with clinical means and through some simple and accessible studies in most cases. All of the patients must receive calcium and vitamin D supplementation.²⁰ The importance of the latter is not

only based on numerous studies that have proven its contribution to mineral gain, in reducing the number of falls and preventing fractures, but have also shown the great frequency of inadequate concentrations of each vitamin in more than half of healthy postmenopausal women, even in sunny countries.^{21,22} In addition, the supplementation of vitamin D (cholecalciferol) is cheap. Treatment with antiresorptive drugs, especially biphosphonates, is necessary in those with a history of fractures due to frailty and in those with osteodensitometry-defined osteoporosis, especially when other risk factors are present. These agents are relatively costly, although they are considered cost-effective if one takes into account the gain in QALY (quality of life-adjusted number of years).²³ Many postmenopausal women at risk can benefit from treatment with hormone replacement therapy, considering the lessons learned from the Women's Health Initiative study. Such therapy has also proven to be cost-effective in the prevention of fractures.²⁴ The efficacy of pharmacologic treatment could increase with a series of non-pharmacologic measures, such as exercise programs, adequate for each particular case, and for fall-prevention measures, such as the identification of obstacles at home, the use of walking-aids and the correction of visual deficits, among others. No patient at risk must be left without a diagnostic process, with or without osteodensitometry. Even those who are not able to obtain antiresorptive drugs due to their cost can benefit from calcium supplements and vitamin D. The modification of lifestyle, especially an increase in exercise, the avoidance of exposure to toxins and the prevention of falls can contribute to avoid many fractures. A positive vision on the part of the clinician, solidly based on scientific aspects, can contribute to alleviate the limited resources available to individual patients and, eventually, to public health.

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