Arch Osteoporos (2012) 7:21–24
DOI 10.1007/s11657-012-0077-0

OPINION PAPER

# When the government actively faces the burden of osteoporosis: the Italian experience

**Maria Luisa Brandi · Giuseppe Guglielmi · Salvatore Masala · Salvatore Minisola · Sergio Ortolani · Umberto Tarantino · Giovanni Simonetti**

Received: 16 January 2012 / Accepted: 20 February 2012 / Published online: 26 July 2012
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**Abstract**
*Epidemiology and costs of fragility fractures in Italy* The problem of osteoporosis is emerging as growing phenomenon, with an enormous impact on quality of life and on health expenses. As a consequence, a reduction in the social and health impact of bone fragility would be associated with an improved quality of life of all elderly citizens and with valuable cost savings at the health system level.
*Osteoporosis: evolution of the concept in Italy* In the last 20 years, there have been enormous advances in the knowledge of diagnostic and therapeutic options and thus we would be in the position of starting effective therapies in at risk populations. However, this not always happens.
*New approaches to the fragility fractures by the Italian government* In this paper we offer to the reader the possibility to know the history of osteoporosis, its diagnosis and its therapy in Italy, a country where life expectancy is one of the highest in the world.
*The future of osteoporosis in Italy* We hope that the example of Italy would serve as an inspiration to those countries where the history of osteoporosis only recently began.

**Keywords** Osteoporosis · Regulatory agencies · Reimbursement · Antifracture drugs

## Epidemiology and costs of fragility fractures in Italy

Osteoporosis is a disorder considered by the World Health Organization (WHO) to be second only to cardiovascular diseases as a critical health problem [1]. Indeed, published work clearly showed that the incidence of costs of hip

M. L. Brandi
Department of Internal Medicine, University of Florence, Florence, Italy

G. Guglielmi
Department of Radiology, University of Foggia, Foggia, Italy

G. Guglielmi
Department of Radiology,
Scientific Institute Hospital "Casa Sollievo della Sofferenza",
Viale Cappuccini 1,
71013 San Giovanni Rotondo, Italy

S. Masala · G. Simonetti
Department of Diagnostic and Molecular Imaging,
Interventional Radiology and Radiation Therapy,
University Hospital of "Tor Vergata",
Rome, Italy

S. Minisola
Department of Internal Medicine and Medical Disciplines "Sapienza",
University of Rome,
Rome, Italy

S. Ortolani
Centre for Metabolic Bone Disease and Rheumatology,
Istituto Auxologico Italiano IRCCS,
Milan, Italy

U. Tarantino
Department of Orthopaedics and Traumatology, PTV Foundation,
University Hospital of "Tor Vergata",
Rome, Italy

M. L. Brandi (✉)
Bone Metabolic Unit, Department of Internal Medicine,
Medical School, University of Florence,
Viale Pieraccini, 6,
50139 Florence, Italy
e-mail: m.brandi@dmi.unifi.it

fractures in Italy is comparable to those of acute myocardial infarction [2–4].

Italy is a country where life expectancy is one of the highest in the world, with an increase at a rate of 4 months per year from 1950 to 2005, reaching 78.4 years for men and 87.4 years for women [5, 6]. At present, 20 % of the Italian population is over 65 years of age, with 5.6 % being already ≥80 years [2]. These age groups will represent respectively 30 and 11 % of Italians by the year 2050. The increased life expectancy is integrally associated with a higher prevalence of degenerative disorders, such as involutional osteoporosis and the fractures that arise.

The main Epidemiological Study On the Prevalence of Osteoporosis in Italy reported a high prevalence of osteoporosis with age specific rates ranging from 9 up to 45 % respectively in women 40 to 49 and 70 to 79 years old, with almost 15 % prevalence in men aged 60 or more years [7, 8]. As osteoporosis is a condition that increases the risk of fragility fractures, it is not surprising that with the increase of the elderly population, this type of fractures appears to increase in Italy, with estimated costs for the major fracture sites being over one billion of euro per year [9]. As the burden of major osteoporotic fractures in Italy is very high, prevention strategies aimed to reduce their incidence have to be carried out at regional and national levels.

## Osteoporosis: evolution of the concept in Italy

The social and health relevance of osteoporosis has been realized only recently, and this is due to the available knowledge of methods needed to "measure" osteoporosis in humans. In the 1970s, osteoporosis was a condition not clinically diagnosed and, therefore, not pharmacologically treated. It was with the advent of bone densitometry techniques that the disorder started to be recognized [10–13], still with no pharmacological interventions up to the 1980s [14, 15].

The development of bone mineral density (BMD) measurement took years to provide a methodology with enough precision and reproducibility for use by the international scientific community [10–13]. The development opened the possibility to measure bone mass and, therefore, to diagnose the condition of "low BMD", that is osteoporosis. Osteoporosis was soon recognized as a condition characterized by low bone mass and microarchitectural deterioration of bone tissue, with a consequent increase in bone fragility and susceptibility to fracture. However, only in 1994, a WHO expert panel operationalized this concept by defining diagnostic criteria for osteoporosis on the basis of measurement of BMD and relating it to the mean BMD of young adult women (*T* score), with a quantitative segregation of two progressive stages, osteopenia and osteoporosis [16].

These efforts were paralleled by a limited number of reports related to pharmacological interventions with estrogens and calcitonin peptides in patients with low bone mineral density [17–22]. Those first publications can easily be recognized as the harbinger of the explosion that research would take place in the following years.

There were, however, pitfalls in those initial attempts that soon would become apparent. Parenteral calcitonin had interesting pharmacological effects, such as densitometric, biochemical and analgesic properties [23–25]. However, the utilization of the drug was not always appropriate, without at that time proven antifracture efficacy on the basis of clinical controlled studies.

Italy became the cradle of an explosive pharmaceutical growth. And if this was justifiable in terms of clinical interest, with time, it did not appear acceptable for the economic burden that the industry promotional activity caused in the health expenditure for the Italian government. At that time, 25 % of the world market for calcitonin was in Italy. The result of this anomaly was the big pharma scandal that at the beginning of the 1990s that prompted the Italian government to reassess the reimbursement policy for all osteoporotic drugs, with the requirement that antifracture activity be demonstrated for the approval of molecules to treat osteoporosis.

The events described can be interpreted as a sign of progress. However, the overprescription of calcitonin created a deep distrust towards this disorder considered to be a condition artificially contrived by the pharmaceutical industry with the sole aim of increasing drug use. As a consequence, even if it is true that the availability of interventions for osteoporosis was slow in several developed countries, in Italy, the previous experiences made this process particularly complex.

An example of this is that densitometric measurements are reimbursed by the Italian public health system, but under the umbrella of the "Livelli Essenziali di Assistenza" (that means Essential Standard of Care), with limitations regarding the requirements needed to get a densitometry performed under full coverage (i.e. women ≥65 years of age in the absence of a few selected risk factors). The need for selection tends to limit recognition of low bone mass in the postmenopausal population by the general practitioners, with consequent underdiagnosis of osteoporosis.

The reimbursement policy in Italy is regulated through rules decreed by the Agenzia Italiana del Farmaco via a dedicated notification (Nota 79). The first document was published in October 2004 and subsequently reviewed in 2006, 2007, 2009 and 2011. The introduction of an approach of primary prevention was introduced in 2007 for those patients with *T* score values measured at the hip by DXA below −4.0 SD or below −3.0 SD when associated with a few defined clinical risk factors. Densitometry by

ultrasound either at the phalanx or at the heel level was also considered after appropriate adjustments.

It was only in 2002 that an official inquiry on osteoporosis in Italy was promoted by the Italian senate, with strong recommendations for the adoption of prevention strategies at regional level in order to decrease the incidence of osteoporotic fractures [26]. Some actions were initiated, such as the TARGET (Appropriate Treatment of Geriatric Refractures in Tuscany) project promoted by the Tuscany region in order to reduce the incidence of hip re-fracture by ensuring adequate antifracture treatment to the elderly population who had sustained a hip fragility fracture [27]. Specific preventive strategies modelled on the Tuscany TARGET project will certainly be implemented in other Italian regions, as has already occurred in the Veneto Region.

## New approaches to the fragility fractures by the Italian government

Within the policy developments framework in 2008, the European Union (EU) published a document on future achievements and challenges for osteoporosis. The document re-evaluated after a decade the needs for improving the management of osteoporosis in the member states, encompassing a number of recommendations (Table 1). Coincidentally, in December 2008, the Italian senate approved a motion that included working areas attempting to comply with the EU recommendations.

The immediate establishment of a dedicated working group on osteoporosis and fragility fractures that would advise the ministry of health on methods to evaluate the real burden of osteoporotic fractures and indications on how to prevent them clearly indicated that the Italian government is now considering fragility fractures as a high priority in the national health system, in accordance with the recommendations found in the 2008 report from the European Commission. The group is multidisciplinary, encompassing internal medicine, orthopaedics, epidemiology, radiology and metabolism experts. The primary goal of the working group was to create indicators that would allow the ministry of health to assess the evolution of the fragility fractures incidence in a timely and appropriate manner. The ministry was therefore advised to create the Italian Registry of Fragility Fractures (Registro Italiano delle Fratture da Fragilità) that will be populated with data provided by emergency departments in order to identify not only hip fractures but also those fragility fractures that do not result in hospitalisation, and that are not presently identified in any central system. The registry will represent a key element to assess direct and indirect cost estimates, to evaluate social costs, as well as to collect information on the quality of treatment, and ultimately to define optimal standards of care.

**Table 1** Osteoporosis in Europe: policy developments in 2008

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| 1. Osteoporosis needs a higher political profile |
| 2. Most countries do not have fracture registries |
| 3. Reimbursement policies are too restrictive |
| 4. Many high-risk individuals are not being detected or treated |

The other activity of the working group was to prepare a health book dedicated to osteoporosis and fragility fractures, with a special focus on appropriateness in diagnosis and therapy interventions (the book can be downloaded from the website of the ministry of health—http://www.quadernidellasalute.it/download/press-area/cartella-stampa/4-luglio-agosto-2010/4-luglio-agosto-2010-Sintesi-dei-contributi.pdf). In the book, prevention strategies were reviewed from a primary, secondary and tertiary preventive. The book also included a declaration by the minister of health on the objectives to be reached by the health service in the prevention of fragility fractures. The text specifically reads “In 5 years, we believe that 70 % of patients under treatment for osteoporosis will be continuing with their therapy after 1 year, and that 80 % of patients that are hospitalised for a fragility fracture will be treated to avoid the risk of a recurring fracture. We estimate that by reaching these goals, the incidence of femur fractures could be reduced by 20 % in the next 10 years, thus contributing in a significant manner to improving the quality of life of our elderly population”.

## The future of osteoporosis in Italy

At present, in Italy, there is a great expectation that the national health system will put major efforts into the reduction of the health and socio-economic burden of fragility fractures, especially considering the availability of both biochemical and instrumental diagnostic tools, and of therapeutic agents with proven antifracture efficacy. The recent document presented in 2010 by the working group on osteoporosis and fragility fractures to the Italian Minister of Health has been defining diagnostic, therapeutic and rehabilitation appropriateness in the prevention and treatment of fragility fractures.

By the analysis of the policy developments on osteoporosis within the EU (Table 1), several of the requirements are now incorporated within the Italian programme. Indeed, the first objective to be reached has been implemented, as osteoporosis has now a good visibility and a higher political profile in our country. The second objective that is the attempt to launch fracture registries has been evaluated at the central level, and a project is now ongoing, aiming to register the osteoporotic fractures as fragility events to be

recognized as such in the emergency department of the Italian hospitals via a dedicated discharge diagnosis. More difficult at the moment is to proceed with the third objective of expanding the reimbursement policy that would require additional resources difficult to find in a moment of general restrictions as the present one. However, pharmacoeconomic profiles are now ready for the agencies to be evaluated and the figures look encouraging to proceed towards more generous reimbursement policies. The last objective, lack of detection and treatment of affected individuals, has been faced with the help of patient and not-for-profit organizations that offer screening possibilities in events organized throughout the country. Moreover, in some regions, special projects have been launched with the main goal of treating the majority of the elderly people who suffered for a hip fragility fracture, a patient population certainly undertreated at the moment with antifracture drugs.

Recently, a major challenge arose from the increasing heterogeneity of health policies at regional level, which is the consequence of the growing administrative autonomy of each Italian region. Despite the fact that the standard levels of health care are dictated at national level, this regional autonomy translates to some differences in the reimbursement of diagnostic tests and therapies. However, we can look to the future of osteoporosis is Italy with a more optimistic vision. Osteoporosis is not felt anymore to be a condition that does not deserve attention. We have to follow the indicated path and hope for tangible results.

**Acknowledgments** The authors are grateful to Mrs. Giada Bartoli for the secretarial help. This work was supported by FIRMO Fondazione Raffaella Becagli.

**Conflicts of interest** None.

## References

1. Kanis JA, Burlet N, Cooper C, Delmas PD, Reginster JY, Borgstrom F, Rizzoli R, European Society for Clinical and Economic Aspects of Osteoporosis and Osteoarthritis (ESCEO) (2008) European guidance for the diagnosis and management of osteoporosis in postmenopausal women. Osteoporos Int 19:399–428
2. Piscitelli P, Iolascon G, Guida G et al (2005) Femoral fractures and orthopaedic surgery in Italy. J Orthopaed Traumatol 6:202–205
3. Iolascon G, Gimigliano F, Piscitelli P, Guida G (2007) Hip fractures in Italy, analysis of DRG data. Aging Clin Exp Res 19(suppl 3):2–4
4. Piscitelli P, Iolascon G, Gimigliano F, Muratore M, Camboa P, Borgia O, Forcina B, Fitto F, Robaud V, Termini G, Rini GB, Gianicolo E, Faino A, Rossini M, Adami S, Angeli A, Distante A, Gatto S, Gimigliano R, Guida G, SIOMMMS study group, CERSUM research group (2007) Incidence and costs of hip fractures vs. acute myocardial infarction in the Italian population: a 4 years survey. Osteoporos Int 18:211–219
5. WHO stat.information system (WHOSIS). http://www.who.int/whosis/en/
6. Italian Statistics 2008. National Institute for Statistics, Rome 2009.
7. Adami S, Giannini S, Giorgino R, Isaia G, Maggi S, Sinigaglia L, Filipponi P, Crepaldi G, Di Munno O (2003) The effect of age, weight, and lifestyle factors on calcaneal quantitative ultrasound: the ESOPO study. Osteoporos Int 14:198–207
8. Maggi S, Noale M, Giannini S, Adami S, Defeo D, Isaia G, Sinigaglia L, Filipponi P, Crepaldi G (2006) ESOPO Study Group: quantitative heel ultrasound in a population-based study in Italy and its relationship with fracture history: the ESOPO study. Osteoporos Int 17:237–244
9. Tarantino U, Capone A, Planta M, D'Arienzo M, Mauro GL, Impagliazzo A, Formica A, Pallotta F, Patella V, Spinarelli A, Pazzaglia U, Zarattin U, Roselli M, Montanari G, Sessa G, Privitera M, Verdoia C, Corradini C, Feola M, Padolino A, Saturnino L, Scialdoni A, Rao C, Iolascon G, Brandi ML, Piscitelli P (2010) The incidence of hip, forearm, humeral, ankle, and vertebral fragility fractures in Italy: results from a 3-year multicenter study. Arthritis Res Ther 12:R226
10. Nordin BE, Barnett E, MacGregor J, Nisbet J (1962) Lumbar spine densitometry. Br Med J 1:1793–1796
11. Mason RL, Ruthven C (1965) Bone density measurements in vivo: improvement of X-ray densitometry. Science 150:221–222
12. Cameron JR, Mazess RB, Sorenson JA (1968) Precision and accuracy of bone mineral determination by direct photon absorptiometry. Invest Radiol 3:141–150
13. Exton-Smith AN, Millard PH, Payne PR, Wheeler EF (1969) Method for measuring quantity of bone. Lancet 2:1153–1154
14. Chesnut CH 3rd, Kribbs PJ (1982) Osteoporosis: some aspects of pathophysiology and therapy. J Prosthet Dent 48:4–7
15. Raisz LG (1982) Osteoporosis. J Am Geriatr Soc 30:127–138
16. World Health Organization (1994) Assessment of fracture risk and it application to screening for postmenopausal osteoporosis. Geneva: World Health Organization. Technical Report Series, No. 843
17. Caniggia A, Gennari C, Bencini M, Cesari L, Borrello G (1970) Long-term treatment with thyrocalcitonin in senile osteoporosis: metabolic aspects. Boll Soc Ital Biol Sper 46:85–86
18. Wallach S, Aloia J, Cohn S (1972) Treatment of osteoporosis with calcitonin. Semin Drug Treat 2:21–25
19. Melick RA, Martin TJ, Storey E (1973) Use of porcine calcitonin in osteoporosis. Aust N Z J Med 3:285–289
20. Milhaud G (1975) Calcitonin 1975. Biomedicine 24:159–162
21. Judd HL, Meldrum DR, Deftos LJ, Henderson BE (1983) Estrogen replacement therapy: indications and complications. Ann Intern Med 98:195–205
22. Mazzuoli GF, Passeri M, Gennari C, Minisola S, Antonelli R, Valtorta C, Palummeri E, Cervellin GF, Gonnelli S, Francini G (1986) Effects of salmon calcitonin in postmenopausal osteoporosis: a controlled double-blind clinical study. Calcif Tissue Int 38:3–8
23. Overgaard K, Hansen MA, Jensen SB, Christiansen C (1992) Effect of salcatonin given intranasally on bone mass and fracture rates in established osteoporosis: a dose–response study. BMJ 305:556
24. Rifat SF, Kiningham RB, Peggs JF (1992) Calcitonin in the treatment of osteoporotic bone pain. J Fam Pract 35:93–96
25. Chesnut CH 3rd, Silverman S, Andriano K, Genant H, Gimona A, Harris S, Kiel D, LeBoff M, Maricic M, Miller P, Moniz C, Peacock M, Richardson P, Watts N, Baylink D (2000) A randomized trial of nasal spray salmon calcitonin in postmenopausal women with established osteoporosis: the prevent recurrence of osteoporotic fractures study. PROOF Study Group. Am J Med 109:267–276
26. Italian Senate Health Commission (eds). Official report of the survey on osteoporosis. Italian Senate, Rome 2002.
27. Piscitelli P, Brandi ML, Nuti R, Rizzuti C, Giorni L, Giovannini V, Metozzi A, Merlotti D (2010) The TARGET project in Tuscany: the first disease management model of a regional project for the prevention of hip re-fractures in the elderly. Clin Cases Miner Bone Metab 7:251–254