

The Role of Osteoporosis in Hip Fractures in Two Italian Hospitals

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Abstract

The World Health Organization (WHO) defines osteoporosis as a disease characterized by low bone mass and deterioration of the micro architecture of bone tissue, which causes an increased brittleness of the same, with a consequent increase in fracture risk. Osteoporosis affects more than 200 million individuals in the world, potentially 5 million people in Italy, of which 80% post-menopausal women.

In the daily practice of Orthopedics and Traumatology departments is very frequent hospitalization for fracture of the femoral neck in elderly patients. In our study we observed 162 patients hospitalized with hip fracture diagnosis at two Italian hospitals. In most cases there were fragility fractures with previous diagnosis of osteoporosis, but patients had never received an anti osteoporotic therapy. The prescription of a medical therapy in patients with osteoporosis is an essential prevention of secondary fractures.

Introduction

Osteoporosis is a bone disease that occurs when the body loses too much bone, makes too little bone, or both. As a result, bones become weak and may break from a fall or, in serious cases, from sneezing or minor bumps. Every year in Italy the number of patients admitted for fragility fractures is over 130,000 individuals, but this statistic is probably underestimated [1]. Osteoporosis is often a under diagnosed and undertreated disease. In fact, it is called the “silent disease”, because bone loss usually occurs gradually over the years without symptoms. Many people aren’t aware that they have osteoporosis until they either have a bone Densitometry Test (DXA) or have a minor fall which causes a bone to break. Often, this “fragility fracture” (a fracture resulting from a mild fall from standing height) is the first sign of osteoporosis [2].

Typical fractures in patients with osteoporosis include vertebral (spine), proximal femur (hip), distal forearm (wrist) and proximal humerus; the hip fracture can cause morbidity and mortality in the elderly [3].

In fact, it is estimated that the femur fractures involving the deaths in the period immediately following the event in 5% of cases, rising to 20% within a year of the fracture; while 40% of patients lose the ability to walk independently and 80% of patients is no longer able to perform autonomously an activity of daily living [4]. In most cases the fragility fractures are treated without considering osteoporosis, because it is not made a specific diagnosis and targeted therapy, with the risk of a new fracture and other long term effects, just as pain, chronic disability and even death [5].

According to published data, in 2050 the femur fractures will become 2.26 million, doubling in the space of 50 years in Europe, to over 970,000 cases [5]. The social and economic impact is obviously devastating for the dramatic effect on the quality of life of the population and the costs of treatment.

However the hip fractures are the first sign that a patient is suffering from osteoporosis.

So the orthopedic doctor is often the first and only physician who has the opportunity to perform the first diagnosis of osteoporosis and to establish an appropriate diagnostic and therapeutic protocol.

The main purpose of this study was to verify if the osteoporotic disease had been diagnosed and treated before the fracture in elderly patients hospitalized for fragility hip fracture.

Materials and Methods

This study was approved by ethics committee of two hospital (San Giacomo Hospital, Castelfranco, Italy and Santa Maria degli Angeli Hospital, Pordenone, Italy), and all patients were well informed of this study after hospitalization. A total of 162 elder patients with hip fracture were treated between September 2014 and September 2015.

Patients

This study involved 31 males (19.2%) and 131 females (80.8%) with a mean age of 81 years (range, 75 - 94 years). 96 patients had a pertrochanteric hip fracture, 66 patients had a femoral neck fracture. The exclusion criteria were as follows: multiple myeloma, Paget's disease, bone metastases, and patients with dementia or underperforming the Mini Mental Status (MMS) test, patients aged less than 75 years. All surgical treatment were performed by the same group of experienced surgeons.

Surgical technique

All patients were treated with surgery: hip trochanteric fractures were treated with an intramedullary nail, while the fractures of the femoral neck with a bipolar hemiarthroplasty.

Study design

We conducted a retrospective population-based cohort study using data from the Diagnosis Related Groups (DRG) of hospital discharge (hip: ICD-9 code 820-821). The evaluation was carried out through the collection of demographic data and medical history. We have evaluated the risk factors (chronic steroid therapy, hypothyroidism, early or surgical menopause), the eventual previous diagnosis of osteoporosis, the presence of previous fractures (spine, wrist, Femur), the energy of the trauma and the eventual therapy taken against osteoporosis before the trauma.

All collected data were stored on Excel™ spreadsheet (Microsoft Corporation, USA, 2014) and subjected to statistical analysis using JMP the software package for Windows™ (version 2013).

Results

The study included a total of 162 patients between 75 and 94 years. In 71% of patients (n:118) the fracture was secondary to low-energy trauma by accidental fall and in 41% of patients (n°: 66) had a previous diagnosis of osteoporosis. In the clinical history, 32% of patients (n°: 52) had a fragility fracture, and 7% of patients (n°: 12) had suffered a previous hip fracture. 14% (n: 23) of the patients had taken a chronic cortisone therapy and 33% of women had suffered an early menopause. On admission, 31% of patients (n: 50) took on a medical therapy against osteoporosis. The drugs used in 31% of patients were alendronic acid (70 mg), in 56% was the cholecalciferol (1000 IU/ml), and in 23% was the strontium ranelate (2 gr). At discharge from the hospital, 100% of patients received anti-osteoporotic treatment: alendronic acid (70 mg).

Discussion

Osteoporosis is a generalised skeletal disorder characterised by low bone mass and micro-architectural deterioration of bone which leads to fragility and risk of fracture. Moreover, this disease is a silent disease because the bone loss occurs without symptoms. People may not know that they have osteoporosis until a sudden strain, bump, or fall causes a bone to break. According to the National Osteoporosis Foundation, approximately one in two women and one in four men over age 50 will have an osteoporosis related fracture. These fractures can dramatically change the quality of life for patients and their families due to a loss of patient independence, significant disability and even death [6].

The hip fracture occurs in the proximal end of the femur, near the hip and in the vast majority of cases, a hip fracture is a fragility fracture due to a fall or minor trauma in someone with weakened osteoporotic bone [7]. The Italian population is one of the oldest in Europe, with current life expectancy being 77.9 and 84.4 years for men and women, respectively. About 20 % of the Italian population is over age 65 years and 4% over the age of 80 years [8]. Since hip fracture incidence increases exponentially with age, hip fractures are a major public health issue in Italy [8]. Hip fracture is one of the most common public health problems with a significant financial burden on the patient and on the healthcare system. The femur osteoporotic fractures are associated with increased mortality and morbidity: within one year after the fracture, indeed about 20% (5-40%) of the patients died, 40% are unable to walk independently, and 25% require long-term home care [9].

Hip fracture imposes a considerable burden on patients, payers, and society in terms of premature death, long-term disability, restricted social functioning, cost of care, lost productivity, and informal caregiver time [10]. A U.S. study has reported that about 11.5% of 950 patients over age 65 admitted to selected hospitals with a hip fracture between 1987 and 1997 died after 1 year [11]. The 1-year mortality rate was 15.7% among 541 fracture patients over 60 years of age admitted to one university hospital in Greece between 1989 and 1992 [12]. In a population-based, case-control study in Sweden, about 10.6% of 2,245 women aged 50-81 years admitted with a hip fracture died within 1 year [13].

Another important aspect is that a previous fracture increases by about 5 times the risk of a subsequent event of fracture with a 6% incidence in the first month and 4% in the next 6 months [14]. Although menopause accounts for much of the association between age and osteoporosis, bone ageing occurs even before the menopause in many women [15]. Women lose bone density at a faster rate than men do, in part because the drop in estrogen levels that occurs with menopause accelerates bone loss. The lifetime risk of hip fracture is 17.5 percent for women and 6 percent for men [16]. On average, women who sustain a femoral neck fracture are 77 years old and men are 72 years old [17]. The actual aetiology of age-related bone loss is unknown, although it is understood to involve an imbalance in bone remodelling. Possible explanations include reduced osteoblast lifespan, increased osteoclast lifespan, abnormal osteocyte signalling or a physiological response to inactivity in old age [18]. The efficiency of calcium absorption in the duodenum is also known to decline with age. Osteoporotic fractures, particularly of the hip, are associated with increased mortality and morbidity: within one year after the fracture, in fact, about 20% (5-40%) of the patients died, 40% can not to walk independently and the 25% need long-term home care [19]. An aspect not to be underestimated is that previous fracture increases of about 5 times the risk of a subsequent event in fracture with a 6% incidence in the first month and 4% in the next 6 months. According to the World Health Organization criteria (WHO) the osteoporosis treatment should be aggressive as possible for those who had already a fragility fracture [20]. The results of this study clearly show that in mostosteoporotic patients with osteoporotic hip fracture had not been previously prescribed an appropriate medical therapy. This is in agreement with the most recent literature. Gardner, et al [21] highlighted that 81% of 300 patients with femoral neck fracture were discharged without medical therapy for osteoporosis, and

that only 18% had received a suitable treatment to prevent bone resorption at discharge from hospital. Previously Torgerson and Dolan [22] have detected as for fractures of the femur there is a great limitation of anti osteoporotic therapy. Karl Cho et al [23] showed that the mean calcium intake was well above the daily recommended intake regardless of gender, despite the general dominant incidence of osteoporotic hip fracture in women. Another major multicenter study found that out of 3422 surgeons surveyed, only 40% of them prescribed anti osteoporotic therapy [24].

In our study, we observed that the majority of people with hip fracture had not an anti-osteoporotic therapy. For almost the totality of patients with a previous fragility fracture he did not show any therapy for bone recovery. These data show that the culture of osteoporosis is little by orthopedic surgeons and how this ignorance can cause damage in the elderly population.

Conclusion

Our data confirm that osteoporosis is currently an underestimated disease; furthermore, in Italy the reduced share of investment in the sector in an era of rationing of economic resources does not help the development of knowledge, nor allows adequate medical awareness. The physician's role should not be resolved in the treatment a surgical emergency, but to continue in the management osteoporosis, which is the pathological substrate fracture.

In the management of the elderly patient with hip fracture is very important that the physician for establishing an appropriate medical therapy with drugs that significantly reduce the risk of fracture, and more specifically the risk of femoral fracture. The development and implementation of guidelines and algorithms for diagnosis and treatment will be essential for the secondary treatment of fragility fractures bone.

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