Knowledge of orthopaedic surgeons in managing patients with fragility fracture

Reza Sorbi · Mohamad Reza Aghamirsalim

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Abstract

Purpose Fragility fractures represent a major health problem, as they cause deformity, disability and increased mortality rates. Orthopaedic surgeons should identify patients with fragility fractures and manage their osteoporosis in order to reduce the risk of future fracture; therefore, orthopaedic surgeons' knowledge about managing fragile fracture should be evaluated.

Methods A questionnaire was administered to 2,910 orthopaedic surgeons to address the respondents' knowledge. The questions covered the topics of diagnosis, treatment and approach to a patient with a fragility fracture. The data-collection period for this survey spanned one year.

Results There were 2,021 orthopaedic surgeons who participated in this study. Less than 10% of the respondents included bone mass densitometry (BMD) when evaluating patients with fragile fractures 32% prescribed proper dosage of calcium and vitamin D; approximately 30% would refer if falling from a height was suspected.

Conclusions The majority of orthopaedic surgeons questioned lacked knowledge of fragility fracture management. This is reflected by limited knowledge of osteoporosis assessment and treatment in most areas. An appropriate method should be created to manage patients with fragility fractures to guarantee the patient the best possible care.

Introduction

Osteoporotic fractures are characterised by a low-impact trauma and can occur in every bone, with femoral-neck, distal-radius and vertebral fractures being the most common [1]. It has been estimated that one fifth of men and one third of women over the age of 50 years will sustain a major fragility fracture through their remaining lifetime [2]. Osteoporotic fractures represent a major health problem in most developed countries [3], as they result in deformity, disability, increased mortality rates and significant health-care costs [4]. It is estimated that the number of fractures will increase by 4% annually [5]. With fracture rates rising so rapidly, it is projected that these fractures will reach epidemic proportions, exceeding six million by 2050 [6].

It seems to be important to identify whether patients who experience fragility fractures are being diagnosed with and treated for osteoporosis to reduce the risk of future fracture [7]; however, according to previous studies, osteoporosis is underinvestigated and undertreated in patients with fragility fractures [8, 9]. These patients' fractures are typically managed in an orthopaedic environment. This environment therefore provides an opportunity within which to capture a substantial proportion of patients who merit post-fracture assessment of future fracture risk and may benefit from intervention to reduce that risk [10]. In view of this critical health issue, it is necessary to question how orthopaedic surgeons can provide appropriate medical investigation and treatment of patients with fragility fractures. Although orthopaedic surgeons are often involved in fracture care, a perception exists that they are not engaged in osteoporosis care [11] and still neglect to identify, assess and treat such patients for osteoporosis [9, 12, 13]; therefore, orthopaedic surgeons must consider playing a more central

R. Sorbi · M. R. Aghamirsalim (✉)
Students' Scientific Research Center (SSRC),
Exceptional Talent Development Center (ETDC),
Tehran University of Medical Sciences (TUMS),
Tehran, Iran
e-mail: aghamirsalim@gmail.com

R. Sorbi · M. R. Aghamirsalim
Department of Orthopaedic and Trauma Surgery, Shariati Hospital,
Tehran, Iran

role in the management of overall bone health [14]. Despite the increase of orthopaedic surgeons' involvement in medical management of their patients with a fragility fracture, it seems to be unclear how strongly they believe in treating these patients rather than referring them for treatment and whether they consider initiation of medical treatment for patients with a low-impact-trauma fracture to be a necessary extension of their responsibilities. In order to address the possibility of osteoporosis, many potential barriers exist in this high-risk patient population, including blurred lines of responsibility for the orthopaedist concerns regarding the use of medication and knowledge of efficacy and safety of existing therapies [15]. The overall goal of this study was to estimate awareness and knowledge in preventing and treating osteoporosis in patients with fragile fractures in orthopaedic surgeons.

Method

A survey composed of seven closed questions was administered by our research team to 2,910 orthopaedic surgeons. The content of the study was developed from a literature review and from data obtained from interviews with orthopaedic surgeons. The form of the survey questions and responses were patterned as multiple choice. Questions addressed the respondent's knowledge about fragility fracture, underlying osteoporosis care and opinions regarding appropriate treatment interventions and related responsibilities. The invited orthopaedic surgeons were chosen randomly from the PubMed database. Mailing addresses were obtained from their articles published in PubMed. The questionnaire was sent with a transmittal letter. No distinction was made between a surgeon in a rural or urban area, in private practice or at an academic centre. Surveys were first mailed in June, and a second mailing to the nonresponders was carried out three weeks later. No remuneration was offered to the responders. To assess possible differences between responders and nonresponders, surveys were resent to nonresponders with a transmittal letter from the principal investigator that stated the importance of the study and that completion of the survey was essential to ensure the statistical reliability of the study. Five hundred and four additional surveys were obtained from initial nonresponders. Of the 2,910 surveys that were sent, 2,021 completed surveys were returned (69% response rate). This questionnaire had initially been pretested and validated through our osteoporosis care team before being used. Questions covered the topics of diagnosis, treatment and approach to an osteoporotic patient with fragile fracture. Results were compiled six months after the first mailing. The reliability of the questionnaire was assessed by Cronbach's alpha; its values ranged from 0.72 to 0.91. The data-

collection period spanned from April 2009 to March 2010 and continued until a sufficiently rich description of the concept under study was achieved. All statistical analyses were done using the SPSS software. Data were summarised using descriptive statistics [mean $\pm$ standard deviation (SD), number of patients per category, etc.].

Results

Of the 2,910 orthopaedic surgeon invited, the 2,021 respondents (83% men and 17% women) averaged 41 years of age (range 32–69 years) and had a mean of 13 work years (range 5–25 years); 80% of the orthopaedic surgeons did not agree with high doses of vitamin D after stabilisation in a patient with fragility fracture, whereas 14% agreed. Although densitometry was reported as being accessible, fewer than 10% of respondents answered that they would order bone mineral densitometry (BMD) in patients with fragility fractures, which indicates a clear lack of knowledge about the current indications for BMD testing. Calcium and vitamin D are used most often for treating patients with osteoporosis. However, only 63% of orthopaedic surgeons make sure that a surgically treated patient with a fragility fracture is discharged with calcium, vitamin D and indomethacin. Medication dosage differs between orthopaedic surgeons. Although approximately one third of respondents prescribe 1,200 mg/kg calcium and 1,000 IU/day vitamin D daily, the other orthopaedic surgeons believed in different dosages; the other results showed bisphosphonate dosages for prevention (5 mg per day) and treatment (10 mg per day) [16]. If falling is suspected, 56% of surgeons would evaluate for secondary causes of osteoporosis, while 30% would refer to an osteoporosis specialist or the respective team to manage falling. According to the questionnaire, if a patient under corticosteroid therapy for a long period presents with a fragility fracture, continuing previous medication while considering avascular necrosis (AVN) would be started by most surgeons (81%); a much smaller number (7%) would order BMD. Approximately 17% of surgeons felt knowledgeable about managing osteoporosis according to BMD interpretation and would refer a known osteoporotic patient with a fragile fracture to a physician (Fig. 1).

Discussion

Every third man and every second woman over age 60 will experience at least one fragile fracture in their lifetime. The risk of future fracture in patients with low-energy trauma will increase four times more than in individuals who have never experienced a low-energy fracture [17]. Furthermore, randomised controlled trials demonstrate that treatment of

Fig. 1 Survey questions and respondents

osteoporosis in patients with fragility fractures can reduce the risk of future fractures by up to 50% [18]. Although many orthopaedic surgeons state that they should identify and initiate assessment of osteoporosis in patients with a fragile fracture, many do not institute medical management, and they also consider that the patient's primary care providers should be responsible for their medical care [19]. On the other hand, the orthopaedic surgeon is usually the first, and often the only, physician seen by the fracture patient. Therefore, it seems that orthopaedic surgeons have a unique opportunity and major responsibility in managing osteoporosis in a patient with a fragility fracture. However, it has been found [13, 20–24] that many orthopaedic surgeons still neglect to detect, assess and treat such patients for osteoporosis.

This survey reflects the current status of orthopaedic surgeons' knowledge about osteoporosis management in patients with fragility fractures in different countries and health-care systems. Surgeons who responded have probably already positively selected themselves; therefore, the real lack of knowledge about osteoporosis is probably underestimated. Obviously, heterogeneous practice patterns exist in different countries and health-care systems despite the orthopaedic surgeons' statement about identification and initiation of osteoporosis assessment of patients with fragility fractures. Although a majority of orthopaedic surgeons in many countries believe that they should expand their role in the medical treatment of patients with an osteoporotic fracture, most focus their professional attention mainly on surgical fracture intervention. However, small number of the orthopaedic surgeons indicated that they always ensure that a patient with a fragility fracture is referred for a BMD test.

Despite evidence in support of detecting and treating patients for osteoporosis after they have sustained an osteoporotic fracture, up to 95% of fracture patients are discharged without adequate determination of the cause of the fracture. Some reports [20, 22–24] reveal that the majority of patients with recent fractures have not been assessed for low BMD. As mentioned, initiating interventions soon after a fragility fracture occurs may significantly reduce the incidence and severity of subsequent fractures. Fall prevention is an example of these interventions. As an example, trochanteric padding and hip protectors have been shown to reduce hip fractures among those at highest risk [25]. Therapeutic agents, which reduce the risk of future fracture by as much as 50% in patients with existing fractures, should be considered [26, 27]. However, evidence shows that orthopaedic surgeons still neglect to treat fragility-fracture patients for osteoporosis.

Despite these findings, only six of 56 Danish orthopaedic surgery departments treated low-impact trauma fracture patients for osteoporosis [28]. In a US study, 81% of 300

randomly selected patients with femoral-neck fractures were discharged without medication targeting osteoporosis. Forty of those patients (13.3% of the overall group) received calcium, and only 18 (6.0% of the overall group) received, at discharge, a medication to actively treat osteoporosis and prevent bone resorption [22]. In a different US study, Kiebzak et al. investigated 363 patients (110 men and 253 women) with hip fracture: only 4.5% of men and 27% of women were discharged with any kind of treatment for osteoporosis [13]. Torgerson and Dolan also showed that the majority of patients in the UK are not prescribed any pharmaceutical agent following an osteoporotic fracture. In a retrospective analysis of 1,164 US women who sustained a fracture of the distal radius, only 22.9% were managed with at least one of the medications approved for established osteoporosis. A previous study shows that increasing patient age at the time of fracture can decrease the rate of treatment for osteoporosis [24].

It is important that patients with fragility fractures receive appropriate medical treatment, not only for the presenting fracture, but also to prevent future fracture complications. Obviously, in this survey, the majority of orthopaedic surgeons questioned lacked sufficient training and knowledge in osteoporosis management. This is reflected, subjectively and objectively, by limited knowledge of osteoporosis assessment and treatment in most areas. To increase such knowledge, focused educational opportunities need to be established through articles, educational seminars and Web-based learning. In addition, education about osteoporosis and related fractures must be appropriately integrated into the university curriculum and postgraduate training in many countries [29]. It is, therefore, important to create a local methods of facilitating effective medical treatment for secondary prevention of osteoporotic fractures. This method must make it easy and not time consuming for the orthopaedic surgeon to prevent the next fracture. Appropriate intervention has also been hindered by the lack of proper education in orthopaedic departments for the treatment of patients with fragility fractures.

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