Joint Bone Spine xxx (2014) xxx–xxx

Available online at
SciVerse ScienceDirect
www.sciencedirect.com

Elsevier Masson France
EM|consulte
www.em-consulte.com/en

Original article

There is still a care gap in osteoporosis management for patients with rheumatoid arthritis

Jennifer Watt[a], Andy Thompson[a,b], Nicole Le Riche[a,b], Janet Pope[a,b,*]

[a] Department of Medicine, Western University, London, ON, Canada
[b] Division of Rheumatology, St. Joseph's Health Care, London, ON, Canada

ARTICLE INFO

Article history:
Accepted 4 February 2014
Available online xxx

Keywords:
RA
Osteoporosis
FRAX
Treatment guidelines
Adherence
Chart audit predictors of adherence

ABSTRACT

Objectives: To assess compliance rates with the current Canadian osteoporosis guidelines and whether the Fracture Risk Assessment Tool score in patients with rheumatoid arthritis correlated with the likelihood of receiving osteoporosis treatment and having a bone mineral density test.
Methods: Charts of serial outpatients with rheumatoid arthritis were reviewed to collect bone mineral density test data and patients' use of calcium, vitamin D, and osteoporosis treatment. Odds ratios (OR) were calculated to determine if a higher Fracture Risk Assessment Tool score increased the likelihood of osteoporosis treatment or having a bone mineral density test.
Results: Using the Fracture Risk Assessment Tool, the 10-year risk of major osteoporotic fracture was high in 92 (12.5%), moderate in 216 (29.3%), and low in 429 (58.2%) patients. Compared to those at low risk, patients identified as high risk were more likely to receive osteoporosis treatment (OR 16.31, 95% CI 9.45–28.13, $P < 0.001$); calcium (OR 3.89, 95% CI 2.43–6.25, $P < 0.001$); vitamin D (OR 3.46, 95% CI 2.12–5.64, $P < 0.001$); and to have had a bone mineral density test (OR 10.22, 95% CI 5.50–18.96, $P < 0.001$). Among 124 patients currently taking prednisone, half (46.8%) were prescribed a bisphosphonate.
Conclusions: Although compliance with current osteoporosis guidelines remains low among all patients with rheumatoid arthritis, higher risk patients were more likely to have a bone mineral density test and receive treatment for osteoporosis, as indicated by the clear dose response seen along the 10-year fracture risk from low to high-risk groups.

1. Introduction

According to the World Health Organization (WHO) criteria for osteoporosis, the prevalence of osteoporosis at the hip, spine, or wrist was found to be 35% for women and 19% for men who were equal to or greater than 50 years of age [1]. Rheumatoid arthritis and corticosteroid use have both been shown to be independent risk factors for the development of osteoporosis [2,3]. The diagnosis and treatment of osteoporosis is therefore of particular importance to rheumatologists given its high prevalence and the fact that their patients often have multiple risk factors predisposing them to the development of osteoporosis. Rheumatologists also need to consider the significant social and economic burden that a fragility fracture can cause for their patients [4,5].

Previous practice audits have shown that the use of calcium, vitamin D, and bisphosphonates is suboptimal [6–8]. Cheng et al. found that 8% of patients were being treated with a bisphosphonate and 27% were receiving calcium and vitamin D [6]; whereas, Solomon et al. reported that 42% of patients were prescribed an osteoporosis treatment and 25% had calcium and/or vitamin D on their medication list [8]. Not all patients being treated with glucocorticoids for early inflammatory arthritis who were at risk of suffering a fragility fracture were started on appropriate preventative medications either [6,7]. It is important to determine if adoption of guidelines has improved more recently.

Clinical practice guidelines such as the 2010 Canadian Osteoporosis Guidelines have been developed to help guide physician decision-making around the treatment of osteoporosis and the prevention of related fragility fractures. The guidelines recommend the use of an assessment tool (i.e. the Fracture Risk Assessment Tool, FRAX) to stratify patients as low, moderate, or high risk. These guidelines state that all patients identified to be at high risk of suffering a major osteoporotic fracture should be offered pharmacologic therapy with an appropriate first line bisphosphonate or denosumab for the prevention of osteoporotic fractures. Treatment of those at moderate risk is to be guided by the preferences of the patient. Patients at low risk do not require treatment with a bisphosphonate or denosumab. It is recommended that all

* Corresponding author. Division of Rheumatology, St. Joseph's Health Care, 268, Grosvenor St., London, ON N6A 4V2, ON, Canada. Tel.: +1 519 646 6332; fax: +1 519 646 6334.
E-mail address: janet.pope@sjhc.london.on.ca (J. Pope).

1297-319X/$ – see front matter © 2014 Société française de rhumatologie. Published by Elsevier Masson SAS. All rights reserved.
doi:10.1016/j.jbspin.2014.02.001

patients over the age of 50 on prednisone at a dose of ≥ 7.5 mg for ≥ 3 months receive treatment with a bisphosphonate. Regardless of risk category, all patients are to take vitamin D and receive calcium supplements if there is insufficient dietary intake [9].

The WHO Fracture Risk Assessment Tool (FRAX) was also designed to aid physician decision-making by incorporating multiple known risk factors for the development of osteoporosis into a computed score. It uses a number of clinical risk factors including a patient's age, sex, height, weight, past history of fragility fracture, family history of hip fracture, smoking status, alcohol consumption, and femoral neck bone mineral density (BMD) to calculate a patient's 10-year probability of suffering a major osteoporotic fracture and it has been previously validated in a Canadian population. A major osteoporotic fracture is defined as a fracture of the spine, hip, shoulder, or forearm. Rheumatoid arthritis (RA) and exposure to oral glucocorticoids at a dose of prednisolone/prednisone ≥ 5 mg daily for ≥ 3 months or equivalent are also included as independent risk factors [10,11]. FRAX scores can be calculated without a BMD.

The adoption of clinical practice guidelines and assessment tools related to osteoporosis management could serve as important quality improvement strategies for rheumatologists in their daily assessments of patients with rheumatoid arthritis. The main objectives of this study were to investigate compliance rates with the current Canadian osteoporosis guidelines among rheumatologists in an outpatient rheumatology clinic and to assess if patients identified as higher risk of suffering an osteoporotic fracture, as represented by patients' FRAX scores, were more likely to receive osteoporosis treatment and have a bone mineral density test.

2. Methods

This was a retrospective data review of patients with rheumatoid arthritis at the St. Joseph's Health Care Outpatient Rheumatology Clinic. The charts of three rheumatologists at the clinic were included. Using the Ontario Health Insurance Plan (OHIP) billing code 714, 1653 patient charts from a one year period were reviewed in the order in which they were recorded on the OHIP billing summary, which is neither alphabetized nor arranged according to age or any other organized system. For the purpose of this study, patients were classified as having rheumatoid arthritis if they met the 1987 ACR criteria [12].

Each patient completed a standard questionnaire when he or she visited the clinic. The treating physician also documented a history and physical examination. Baseline information including the patient's sex, age, height, weight, body mass index (BMI), smoking status, alcohol consumption, most recent bone mineral density test (BMD) result, and use of prednisone was collected based on patient and physician documentation. Any personal or family history of osteoporosis, previous history of fragility fracture, as well as the patient's current use of an osteoporosis treatment regimen (i.e. bisphosphonate, denosumab, hormone replacement therapy, calcium, vitamin D) was also documented where available. The information recorded by the physician was presumed correct if a conflict existed between patient and physician documentation.

Patients were excluded from the study if: they did not have RA, their height or weight was not documented in the chart, or if they were less than 40 years at the time of their last clinic visit. All patients with seropositive and seronegative RA were included regardless of disease duration. Each patient's 10-year risk of major osteoporotic and hip fracture was calculated with the Canadian version of the WHO Fracture Risk Assessment Tool (www.shef.ac.uk/FRAX/tool.jsp) [13]. Where patient information wasn't available for smoking or alcohol status, it was assumed to be negative in the calculation. A positive result in the calculation for secondary causes of osteoporosis reflected only the documented causes recorded in the chart. A family history of hip fracture usually was not documented in the chart, so where absent, it was assumed to be negative in the calculation. Each patient was then stratified as high (> 20%), moderate (10–20%), or low (< 10%) risk. Thus, missing data was conservatively estimated as negative, thereby biasing towards lower FRAX scores and a lower likelihood of receiving osteoporosis treatment based on the Canadian osteoporosis guidelines.

The primary outcome of the study was to assess whether or not someone deemed to be at high or moderate risk based on his or her FRAX score was more likely to receive osteoporosis treatment than someone with a low 10-year risk of osteoporotic fracture. Physician compliance with the 2010 Canadian osteoporosis guidelines was also assessed as a secondary outcome. Whether or not corticosteroid use in the lowest risk group would influence a patient's likelihood of being prescribed appropriate OP medications was also determined. Baseline patient characteristics were stratified according to FRAX risk group.

Patients' baseline characteristics were assessed using standard descriptive statistics (mean, standard deviation, and interquartile range.) The percentage of patients taking calcium; vitamin D; and a bisphosphonate, denosumab, or hormone replacement therapy (HRT) was calculated according to their FRAX risk category and then a Chi-square test was used to determine the odds ratios with associated 95% confidence intervals to compare those in the high, moderate, and low-risk groups. A chi-squared test was also used to assess whether someone in the low risk FRAX category was more likely to receive treatment with a bisphosphonate. For the purpose of calculating th>e FRAX score, patients were said to have been exposed to glucocorticoids if they had received a cumulative dose of ≥ 5 mg per day for > 3 months; however, for the purpose of assessing compliance with the 2010 Canadian Osteoporosis Guidelines, the percentage of patients over the age of 50 years who were currently taking prednisone at a cumulative dose of ≥ 7.5 mg per day for ≥ 3 months over the preceding year was calculated. All statistical tests were two-tailed and considered statistically significant at a $P < 0.05$. As there were stated primary and secondary outcomes, Bonferonni's correction was not performed. An unpaired t-test was used to determine if those in the highest risk FRAX group who had a BMD done were more likely than those who hadn't had a BMD done to receive osteoporosis treatment. A binary logistic regression analysis was used to assess the factors associated with bisphosphonate use and having a BMD test completed. GraphPad Prism 6 software was used for the calculation of the *t*-test, Chi-square tests, and linear regression analyses. SPSS software was used for logistic regression analysis (version 21).

Ethics approval was obtained from the Health Sciences Research Ethics Board at Western University #102709.

3. Results

Of the 1653 charts reviewed that had an RA (714) billing code over one year, 916 were excluded. There were 306 patients who did not meet RA classification criteria, 107 who were less than 40 years of age, 152 patients for whom the height or weight was not available, and 351 whose charts weren't available at the time of data collection. Of the 737 remaining patient charts, 92 patients (12.5%) were identified as high risk, 216 patients (29.3%) as moderate risk, and 429 patients (58.2%) as low risk for having a major osteoporotic fracture in the next 10 years. In no cases was the FRAX score calculated on the medical record.

Table 1 summarizes the baseline characteristics of patients presenting to an outpatient rheumatology clinic. Patients between the ages of 40 and 92 years old were included in the study. Of the 92 patients with a high-risk of major osteoporotic fracture in the

Please cite this article in press as: Watt J, et al. There is still a care gap in osteoporosis management for patients with rheumatoid arthritis. Joint Bone Spine (2014), doi:10.1016/j.jbspin.2014.02.001