

Original Article

Screening and Treatment of Osteoporosis After Hip Fracture: Comparison of Sex and Race

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Abstract

Most patients with osteoporosis (OP) are untreated and remain so even after hip fracture. Outcomes after osteoporotic hip fractures are worse among men and non-Caucasians compared with Caucasian women. We hypothesized that screening and treatment of OP after hip fracture remains low in men and non-Caucasian women. We identified all patients aged 65 yr or older with a primary diagnosis of hip fracture (ICD9-DM code 820.xx) discharged from an urban public hospital between January 1, 2000 and December 31, 2010. Patients with active malignancy (1 yr before or after the fracture) and Paget's disease were excluded. Also, patients were excluded if they had less than 2 encounters for post-event care at the hospital. Patient charts were reviewed to obtain information on demographics, post-fracture OP screening status (dual-energy X-ray absorptiometry [DXA] ordered or resulted), OP treatment status (prescription for oral bisphosphonates, raloxifene, zoledronic acid, calcitonin, or teriparatide), and referral to rheumatology clinic. Data were captured using Research Electronic Data Capture. Differences in frequency of patients who had been evaluated by DXA and/or prescribed antiosteoporotic therapy after hip fractures overall and stratified by sex and race were evaluated using Chi-squared tests. The study was approved by our hospital institutional review board. There were a total of 596 patients discharged with a primary diagnosis of hip fracture during the study period. After exclusions, 417 patients remained and were included in the analyses. The median age was 80 yr (range: 65–95), 113 (27%) were men, and 243 were White women (57.9%). Overall, 10.3% of the patients were ordered DXA after their hospital discharge, 5.4% of men and 12.1% of women ($p = 0.05$). A total of 19% received treatment for OP, and women were nearly 3 times more likely to receive treatment than men (23.2% vs 8%, $p = 0.004$). The rates of DXA, treatment, and referral to rheumatology did not differ by race. The frequency of OP screening using DXA scan and the initiation of OP treatment was low in all patients after fragility fractures of hip. Women were more likely than men to receive DXA and significantly more likely to receive OP treatment. Although representative of only 1 hospital, these data suggest that more attention should be paid to possible OP among elderly patients hospitalized for hip fracture, and especially among men.

Key Words: Hip fracture; osteoporosis; race; screening; sex.

Introduction

With an aging population, osteoporosis (OP) and OP-related fractures are an important public health problem.

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Hip fracture is the most serious consequence of OP with high morbidity and mortality associated with it (1). The 1-yr mortality rate after hip fracture has been estimated to be between 8.4% and 36% (2).

In addition to disability, the economic cost of hip fractures has become significant. An estimated \$13 billion is spent each year in care for hip fractures in the United States. There is also the cost of post-fracture care. It has been recently found that 58% of the patients with hip fracture require long-term nursing facility care (3). A frequently recognized consequence of hip fracture is increased risk of recurrent fractures.

The risk of future clinical fractures is about 10% (4), and the risk of recurrent hip fracture is about 15% in 4 yr (5).

The OP, the primary cause of low-impact hip fractures in the elderly, is rarely cited as an associated or secondary diagnosis in hospital admissions for such fractures (6). There is increasing body of evidence that antiresorptive therapy along with calcium and vitamin D reduces the risk of new hip fractures and recurrent hip fracture, as well as death from all causes (7). Also, the National Osteoporosis Foundation (NOF) recommends that all patients with fragility fractures of the hip should be treated for OP.

The aim of our study was to assess the rates of OP screening and treatment in Medicare for eligible patients after hip fracture. Similar studies in the past have documented poor rates of screening and treatment, however, with newer guidelines for treatment after hip fracture (8–10) as well as increased availability and lower cost of OP treatment; this study provides a more recent analysis of the current situation. The goal was to evaluate physician adherence to recommendations for both screening and treatment of OP after hip fracture in our hospital setting. We also wanted to determine if screening or treatment varied by patient race or gender. We hypothesized that screening and treatment rates of OP after hip fracture remain low overall and might vary by gender and race.

Materials and Methods

Study Population

The study was done at an academic-based, county hospital in the Midwestern United States. The study protocol was approved by the Institutional Review Board of MetroHealth Medical Center. The hospital inpatient database was used to identify all patients aged 65 yr or older admitted to our institution between January 1, 2000 and December 31, 2010 and discharged with a primary ICD-9-CM diagnosis of hip fracture. If patients were readmitted within a 1-yr period, they were only included as a single admission.

Data Collected

Electronic charts were reviewed by a single researcher, and data were captured using Research Electronic Data Capture software (11). Demographic, clinical data including comorbidities, imaging data, and medication records both current and old were reviewed. Only electronic medical record (EMR) data in our system were included: This includes all subspecialties as well as primary care and inpatient records. If a referral was made to outside the system, it was not visible to the reviewer.

Patients were excluded if there were other possible causes for hip fracture, such as malignancy diagnosis within 1 yr of hip fracture (excluding skin cancer), fractures that were related to trauma (defined as a fall from greater than standing height), and comorbidity of Paget's disease. Admissions were also excluded if there was lack of documented follow up. This was defined as less than 2 outpatient visits after the hip fracture.

Patient who lacked at least 2 outpatient visits after initial hospitalization were not included as we did not have access to their follow up and could not adequately assess outcomes.

Outcomes

Our primary outcome was the documentation in the EMR of an order for a dual-energy X-ray absorptiometry (DXA) within 1 yr of the hip fracture. As all patients were Medicare eligible and the Centers for Medicare and Medicaid Services reimburses for bone density screening every 2 yr, a documented DXA order or result within 1 yr before the hip fracture was also included as a primary outcome because the physician may have felt it inappropriate to order a second study in less than 2 yr. Other outcomes evaluated were prescriptions written at anytime after fracture date; prescription was assessed in the EMRs for any treatments for OP including oral bisphosphonate, calcitonin, teriparatide, zoledronate, and raloxifene.

Analysis

Descriptive statistics were used to characterize the study sample; difference by race and ethnicity was examined using Chi-squared analysis. Student's *t* test was used to compare continuous variables and Chi-squared or Fisher's exact test to compare categorical variables. We used logistic regression to adjust for age with separate models for each outcome.

Results

Using the inpatient database, we identified a total of 596 patients who were discharged with a diagnosis of hip fracture between 2000 and 2010. Of the 596 patients, 417 met the study inclusion criteria and were included in the analysis (Fig. 1). The demographics for the study population are shown in Table 1. The median age of study subjects was 80 yr (range: 65–95), median age for women and men were 80.6 and 76.9 yr, respectively ($p = 0.015$). Of the population, 73% were female and 80% were white. Of the non-white subjects, 75% were female. One-fourth of the patients were hospitalized during the last 2 yr of the study period. After hospital discharge, 21% of patients had a follow up visit in

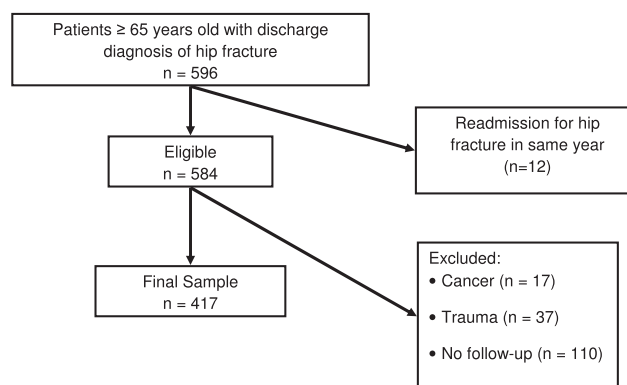


Fig. 1. Outline of the flow of participants through the study.

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