Elderly African-American and Caucasian Men Are Infrequently Screened for Osteoporosis

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Introduction: To retrospectively examine the factors that initiated a request for dual x-ray absorptiometry (DXA) in elderly males in a rheumatology practice and to determine if there were differences between African Americans and Caucasians.

Materials and Methods: The records of 98 consecutive male patients in the rheumatology clinic were reviewed for demographic data and risk factors and treatment for osteoporosis. DXA results were noted and classified as normal, osteopenic or osteoporotic.

Results: There were 59 (60%) African Americans, 38 (39%) Caucasians and one (1%) Native American included for study. Fourteen patients had DXA—three (5%) among the African Americans and 11 (29%) among the Caucasians. Age was not found to be a significant predictor of obtaining DXA. Caucasians were 7.69 times more likely to have a DXA than African Americans. After adjusting for ethnicity, oral glucocorticoid use and rheumatoid arthritis were significant predictors of obtaining a DXA, although only 31% and 35% of patients on glucocorticoids or with rheumatoid arthritis, respectively, had DXA. Using a logistic regression model, ethnicity (odds ratio 4.61) remained the only significant predictor of requests for DXA.

Conclusion: Male patients infrequently had DXA despite the presence of well-established risk factors for osteoporosis. Compared to Caucasians, fewer African Americans were screened even in the presence of similar risk factors for osteoporosis.

Key words: osteoporosis ■ male ■ bone density ■ risk factors

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INTRODUCTION

Osteoporosis commonly occurs in postmenopausal women but is also seen in elderly men[1] and may result in significant morbidity and mortality.[2] In African Americans, osteoporosis occurs at a significant rate, albeit less than that of Caucasians.[1] Despite these data, there is the misconception that osteoporosis is a "woman's disease" and that African Americans are "protected" from osteoporosis. As a result, men, and in particular African Americans, are often not screened for osteoporosis despite the wide availability of dual x-ray absorptiometry (DXA).

In this retrospective study, we reviewed the medical records of elderly male patients attending the rheumatology clinic at the Veterans Affairs Medical Center in Washington, DC to review the use of DXA to screen for osteoporosis and to determine if there were differences in requests for DXA based on ethnic background.

MATERIALS AND METHODS

The study was approved by the Institutional Review Board at the Veterans Affairs Medical Center and granted exemption from informed consent. The medical records of consecutive male patients over the age of 65 years attending the rheumatology clinic between June 2001 and September 2001 were reviewed. Apart from the demographics of the patients, past medical history and potential risk factors for osteoporosis were recorded. These risk factors were derived from a prior study of postmenopausal women[3] to include the following: rheumatoid arthritis (RA), oral glucocorticoids, alcohol consumption (>3 drinks per day), weight <130 lbs, loss of height (by patient history), cigarette smoking (>10 pack, years), history of fragility fractures, history of fragility fractures in a first-degree relative and hormonal therapy for prostate cancer. DXA reports were reviewed by the authors (Richards and Kerr).

Bone mineral density of the lumbar spine and hip were measured by DXA in the anteroposterior view

(Lunar, Madison, WI). Subjects were assigned to three groups based on their bone mineral density T scores (standard deviations from the mean value in healthy young men) at the proximal femur (total, neck or trochanter) or lumbar spine (L1–L4) using values from the manufacturer's reference population for males. A T score of >-1 was normal, T scores between -1 and -2.5 were graded as osteopenia, and those <-2.5 were graded as osteoporosis.

Odds ratios and 95% confidence intervals were constructed for all risk factors, comparing the odds of DXA in patients with the risk factor to the odds of DXA in those without. Ethnicity-adjusted odds ratios and 95% confidence intervals were constructed for the risk factors of oral glucocorticoids, RA and height loss. The risk factors that had significantly elevated unadjusted odds ratios as well as age were included in a logistic regression analysis so that the final model included age, ethnicity, RA, glucocorticoids and height loss. A second logistic regression model was constructed using the total number of risk factors for each patient and ethnicity.

RESULTS

The medical charts of 98 male patients over the age of 65 years were reviewed. There were 59 (60%) African Americans, 38 (39%) Caucasians and one (1%) Native American. The mean age of the cohort was 73.9 years (range of 65–85 years), while that for African Americans was 73.4 years (range of 65–85 years) and for Caucasians, 74.7 years (range of 65–84 years). The Native-American patient was 66 years old, had only one risk factor for osteoporosis, had no DXA performed and so was excluded from further analysis. A total of 14 DXAs were performed in the remaining 97 patients; three (5%) in African-American patients and 11 (29%) in Caucasian patients. Osteopenia was found in two (67%) of the African Americans compared to six (55%) Caucasians. Osteoporosis by DXA was found in one (9%) Caucasian but was not found in any of the African-American patients.

In the unadjusted analysis, age was not found to be a significant predictor of obtaining DXA (OR 1.05, 95% CI 0.94–1.17 for each one-year increase in age). Caucasian patients were 7.69 times more likely (95% CI 1.96–25.00) to have a DXA than African Americans (Table 1). Oral glucocorticoids (OR 5.67, 95% CI 1.70–18.89), RA (OR 8.42, 95% CI 2.37– 29.91) and height loss (OR 3.26, 95% CI 1.02–10.48) were also significant predictors of DXA requests, while smoking, weight <130 lbs, fragility fractures, family history of fragility and low intake of dairy products were not significant in the unadjusted analysis. After adjusting for ethnicity, diagnosis of RA (OR 4.65, 95% CI 1.32–16.41) and oral glucocorticoid use (OR 3.40, 95% CI 1.02–11.31) remained significant predictors for obtaining DXA, while height loss (OR 3.12, 95% CI 0.90–10.86) was not. A logistic regression model that included ethnicity, diagnosis of RA, oral glucocorticoids, age and height loss was performed to determine which risk factors independently predicted a request for a DXA. Caucasian ethnicity was the only risk factor (OR 4.61, 95% CI 1.07–19.94)

Table 1. Frequency of Variables in the Study Population and Percent Who Had DXA

Variable	Number (n)	DXA (%)	Odds Ratio (95% CI)	Odds Ratio Adjusted for Race (95% CI)
African-American	59	6	1.0	—
Caucasian	38	29	7.69 (1.96–25.0)	—
Glucocorticoids	29	31	5.67 (1.70–18.89)	3.40 (1.02–11.3)
Rheumatoid arthritis	29	34.5	8.42 (2.37–29.91)	4.65 (1.32–16.41)
Loss of height	26	26.9	3.26 (1.02–10.48)	3.12 (0.90–10.86)
Low weight	3	33.3	3.12 (0.26–36.86)	—
Smoking	52	19.2	2.38 (0.69–8.21)	—
Fragility fracture	10	30	2.96 (0.67–13.18)	—
Family history of fragility fracture	13	23.1	1.99 (0.47–8.38)	—
Compression fracture (lateral chest radiograph)	7	14.3	5.50 (0.30–100.5)	—
Hormonal treatment for prostate cancer	2	50	—	—
Avoid dairy products	12	8.3	0.50 (0.06–4.24)	—
Other medications	2	0	—	—

that remained a statistically significant predictor of obtaining a DXA (Table 2).

After controlling for ethnicity, the presence of multiple risk factors increased the chance of having a DXA performed by an odds ratio of 1.86 (95% CI 1.24–2.80).

DISCUSSION

Although reviewing small numbers over a short period, this study demonstrates that elderly male patients attending a rheumatology clinic infrequently had DXA. Only 14% of the elderly males had DXA, although 86% of the study population had at least one risk factor for osteoporosis. Fewer African Americans than Caucasians had DXA, and ethnicity remained the only statistically significant factor associated with DXA in the logistic regression model. A low rate of screening for osteoporosis was also reported among African-American women who had risk factors for osteoporosis.[4] Our study demonstrates that this also occurs in African-American men, whereas other studies report a frequency as high as 6% for osteoporosis and 47% for osteopenia[1] for elderly males. In our study, too few DXA were performed to determine the frequency of osteoporosis and osteopenia. However, given the frequency of RA and the use of glucocorticoids in our cohort, we would expect a higher frequency of both osteoporosis and osteopenia in our population.

The study population consisted of patients attending the rheumatology clinic at the Veterans Affairs Medical Center. Given the location and institution, the majority of our patients were African-American (60%) and somewhat older than in most rheumatology practices. The spectrum of diseases in our clinic mirrors that of other practices, with most patients suffering from osteoarthritis, gout, RA, fibromyalgia, ankylosing spondylitis or reactive arthritis. Fewer patients are seen who have systemic lupus erythematosus, polymyalgia rheumatica, polymyositis or vasculitis. Approximately 25% of our patients are treated with corticosteroids, and 20% have RA.

A DXA machine is available at our medical center, and approximately 500 scans are performed each year. We estimate that less than 5% of the total medical center patient population has had a DXA performed. The fact that physicians in a rheumatology practice failed to request DXA routinely in patients on glucocorticoids or with RA—two major risk factors for osteoporosis in patients—accounts for this low figure. Similar results were reported in patients with RA attending a rheumatology practice at an academic medical center, indicating that our results share general applicability.[5] The presence of the other variables examined (alcohol consumption, cigarette smoking, personal history of fragility fracture, family history of fragility fracture and hormonal treatment for prostate cancer) failed to have any association with requests for DXA despite their known associations with osteoporosis.

Due to the small study size and the small number of DXA requests, no association could be made between individual variables and low bone mineral density. Other studies have found certain risk factors to be poor predictors of bone mineral density although they may predict fragility fractures.[6-8] Such findings indicate that factors other than bone density—namely, bone quality—contribute to fragility fractures. Further, whereas men achieve a higher peak bone mass than women,[9] the effect of a single risk factor, such as alcohol or a family history of fragility fractures, may not have the same predictive value for fractures as it does in women. The International Society for Clinical Densitometry published guidelines on the indications for bone mineral density screening that included males (Table 3).[10] These and other guidelines for bone mineral density screening are not followed by many physicians, especially for males, and even less so for African-American patients.[11,12] Contributing factors include the belief that males and African Americans on the whole are protected from osteoporosis. One editorial has even suggested physician apathy and a lack of knowledge on the treatment and diagnosis of osteoporosis to be additional factors.[13]

A major risk factor for osteoporosis in men is hypogonadism, but because this was a retrospective review, we were unable to determine testosterone levels. None of the patients in our study carried a diagnosis of hypogonadism. Similarly, vitamin-D deficiency is common in elderly populations and an often unrecognized cause of low bone mass. However, 25-hydroxy vitamin-D levels were not performed on any of the patients who had osteopenia or osteoporosis.

Table 2. Logistic Regression Model for Variables Associated with DXA

Variable	Number (n)	DXA (%)	Odds Ratio (95% CI)
Caucasian	38	29	4.61 (1.07–19.94)
Glucocorticoids	29	31	1.64 (0.35–7.87)
Rheumatoid arthritis	29	34.5	4.76 (0.95–23.3)
Height loss	26	26.9	3.29 (0.83–12.99)

Table 3. Positions of the International Society for Clinical Densitometry

Indications for Bone Mineral Density Testing

- Women 65 years of age and older.
- Postmenopausal women under 65 years of age with risk factors.
- Men 70 years of age and older.
- Adults with a fragility fracture.
- Adults with a disease or condition associated with low bone mass or bone loss.
- Adults taking medications associated with low bone mass or bone loss.
- Any individual being considered for pharmacologic therapy.
- Any individual being treated to monitor treatment effect.
- Any individual not receiving therapy in whom evidence of bone loss would lead to treatment.

Chronic renal disease and prolonged immobility are two other risk factors for low bone mineral density. Fifteen percent of the study population had renal impairment, with one having renal failure, and only one patient was immobile. Due to the infrequency of these risk factors, they were not included in the analysis.

The consequences of osteoporosis in men, specifically fractures, are staggering. Twenty-two percent of hip fractures occur in men[2] and are associated with significant morbidity. Following hip fractures, there is an increased mortality, the majority within the first six months.[14] Although low bone mass is not the only contributory factor (falls, hip axis length and bone quality also play a role),[15] it is a significant one for which there is now available treatment. Although African-American men obtain higher peak bone mass than other ethnic groups, they are not resistant to osteoporosis and its complications. It is therefore imperative that guidelines to screen males for osteoporosis be developed and disseminated to healthcare providers (Table 3).[10]

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