Introduction: Postmenopausal Osteoporosis as a Major Public Health Issue

HOSAM K. KAMEL, MD, MPH, FACP, AGSF, FGSA,
and MARY BETH O'CONNELL, PharmD, BCPS, FASHP, FCCP

TARGET AUDIENCE

Managed care pharmacists and other health care practitioners

LEARNING OBJECTIVES

Upon completion of this program, participants will be better able to

1. name 3 risk factors for postmenopausal osteoporosis, identify the gold standard bone mineral density (BMD) test method required for diagnosis, interpret test results obtained using this method, and explain the usefulness of biochemical markers of bone resorption and formation in monitoring the response to osteoporosis treatment;
2. recommend an adequate daily intake of calcium and vitamin D for a patient with or at risk for postmenopausal osteoporosis based on her age, advise the patient about dietary sources and supplements to ensure an adequate intake, and make other recommendations for lifestyle modifications to reduce the patient's risk for osteoporosis;
3. characterize the changes in bone mass with age in women and men, specify the primary goal of interventions to prevent and treat osteoporosis for a particular life stage or age, explain the physiology of the bone remodeling process, and identify the targets for osteoporosis drugs in this process;
4. recommend a prescription drug therapy for a patient with or at risk for postmenopausal osteoporosis; discuss the mechanism of action, efficacy, safety, and economics of the medication; and counsel the patient on the proper use of the medication; and
5. define the terms compliance, persistence, and adherence; name a direct and an indirect method for assessing medication adherence; name a possible reason for unintentional and intentional nonadherence to medications used to manage chronic illnesses; explain the potential impact of nonadherence to osteoporosis medications; and recommend a strategy for improving adherence to osteoporosis medications, taking into consideration patient preferences and readiness to change.

J Manag Care Pharm. 2006;12(6)(suppl S-a):S2-S3

Authors

HOSAM K. KAMEL, MD, MPH, FACP, AGSF, FGSA is director, Geriatrics and Extended Care, St. Joseph's Mercy Health Center, Hot Springs, Arkansas; MARY BETH O'CONNELL, PharmD, BCPS, FASHP, FCCP, is an associate professor, Pharmacy Practice Department, Eugene Applebaum College of Pharmacy and Health Sciences, Wayne State University, Detroit, Michigan.

AUTHOR CORRESPONDENCE: Hosam K. Kamel, MD, MPH, FACP, AGSF, FGSA, Director, Geriatrics and Extended Care, St. Joseph's Mercy Health Center, 1635 Higdon Ferry Rd., Suite H, Hot Springs, AR 71913. Tel: (501) 622-1273; Fax (501) 622-2068; E-mail: kamel@pol.net

Copyright© 2006, Academy of Managed Care Pharmacy. All rights reserved.

Osteoporosis is a major public health issue. It is an age-related disease that affects an estimated 10 million Americans.¹ Another 34 million Americans are at risk for osteoporosis because of a low bone mass.¹ By the year 2050, the number of Americans older than 65 years is expected to double, reaching 69 million.² Therefore, the impact of osteoporosis is expected to increase dramatically in the United States in the coming decades.

Eighty percent of patients with osteoporosis are women.¹ The risk for osteoporosis increases after menopause, with 1 in 5 white postmenopausal women affected.³ Whites are the racial group for which the most data on osteoporosis are available, but other racial and ethnic groups also are at risk.¹

Osteoporosis is associated with an increased risk of fractures, which can lead to chronic pain, deformity, disability, and death. One of every 2 women and 1 of every 4 men over the age of 50 years will experience an osteoporotic fracture at some time in their remaining lifetime.¹ Osteoporosis is responsible for more than 1.5 million fractures annually, including more than 300,000 hip fractures, 700,000 vertebral fractures, 250,000 wrist fractures, and 300,000 fractures at other sites.¹

Vertebral fractures, the most common type of fracture, often are accompanied by a loss of height, chronic pain, disfigurement (the characteristic stooped posture from kyphosis), and functional deficits. Hip fractures are less common than vertebral fractures, but they are more devastating. Up to 20% of patients with a hip fracture die within 1 year after the fracture.² More than 30% of patients with hip fractures are permanently disabled, and many patients require help with activities of daily living and require long-term nursing care.² The risk of another hip fracture is 4-fold higher in persons who already have suffered one hip fracture than in people without a history of hip fractures.¹

Osteoporosis has an enormous economic impact in the United States because of the loss of productivity and independence after hip fractures. The health care costs for osteoporosis were estimated at \$13.8 billion in 1995.² The direct costs of osteoporotic hip fractures alone amounted to \$18 billion in 2002.¹ The cost of osteoporosis in the United States could reach as much as \$240 million by 2050.²

Evaluation and treatment of osteoporosis often are inadequate, leading to preventable fractures.^{4,5} Two of 3 cases of osteoporosis go undiagnosed.² Only 1 in 7 women with osteoporosis receives treatment.² Furthermore, after sustaining a hip fracture, most patients do not receive bone density measurements or adequate therapy to prevent subsequent fractures. Research has shown that minimal effort to improve osteoporosis evaluation and treatment can have a dramatic impact on patient outcomes.⁶

Community pharmacists have measured heel bone density and counseled patients effectively on positive lifestyle modifications.⁷

Adherence to osteoporosis medications often is poor because of adverse effects, forgetfulness, a silent disease, or other reasons.^{8,9} Medication nonadherence can compromise patient outcomes, leading to increased health care utilization and costs.⁹

Osteoporosis has been the focus of public and private initiatives because of its large impact on the U.S. economy and quality of life of Americans. The years 2002-2011 have been designated the Bone and Joint Decade in the United States as part of an initiative to improve public awareness, patient education, research, and the diagnosis and treatment of osteoporosis by developing new collaborative partnerships between patient advocacy groups, musculoskeletal associations, care providers, researchers, and industry.¹⁰

In 2004, the Office of the Surgeon General released its first major report on bone health and osteoporosis.^{11,12} In 2004, the National Committee for Quality Assurance adopted a new Health Plan Employer Data and Information Set (commonly referred to as HEDIS) performance measure requiring women aged 67 years and older who have had a fracture to undergo evaluation by dual energy X-ray absorptiometry and receive a bisphosphonate if appropriate within 6 months of the fracture.¹³

In January 2006, as part of its quality improvement efforts, the Centers for Medicare & Medicaid Services launched the Physician Voluntary Reporting Program (PVRP) to improve the health and function of Medicare beneficiaries by preventing chronic disease complications, avoiding preventable hospitalizations, and improving the quality of care delivered.¹⁴ The program involves several quality initiatives in a variety of settings (e.g., hospitals, skilled nursing facilities, home health care agencies, and dialysis centers). Physician participation is voluntary; physicians who choose to participate will gather and submit data about the quality of care provided to Medicare beneficiaries and receive feedback on their performance. The program consists of 36 evidence-based, clinically valid measures that were part of guidelines endorsed by physicians and their medical specialty societies. A smaller core starter set of 16 measures will be used initially to reduce the reporting burden for physicians. Assessment of elderly patients for falls (a major cause of fractures) is one of the 16 core starter set measures. Several of the 20 quality measures that will not be assessed initially as part of the PVRP address postmenopausal osteoporosis.

These public and private efforts to reduce the impact of osteoporosis on Americans have the potential to improve quality of life and reduce health care utilization and costs. The expected growth in the population of elderly Americans at risk for osteoporosis and other chronic illnesses in the coming decades provides an impetus to devise strategies to prevent avoidable morbidity and use limited health care resources wisely.

The first article in this supplement discusses the etiology and diagnosis of postmenopausal osteoporosis and nonprescription interventions used to prevent or manage the disease. In the second article, prescription drug therapies for preventing and treating postmenopausal osteoporosis and some pharmacoeconomic studies are described in detail. The third article defines

medication adherence and explains the limitations of direct and indirect methods for its assessment. Possible reasons for unintentional and intentional nonadherence to medications used for chronic illnesses are suggested, and the impact of nonadherence to osteoporosis drug therapies on patient outcomes and health care costs is quantified. Considerations in devising individualized strategies for improving adherence also are discussed.

DISCLOSURES

This article is based on the proceedings of a symposium held on April 6, 2006, at the Academy of Managed Care Pharmacy's 18th Annual Meeting and Showcase in Seattle, Washington, which was supported by an independent educational grant from Roche Laboratories and GlaxoSmithKline. The authors received an honorarium from Roche Laboratories and GlaxoSmithKline for participation in the symposium. Kamel discloses no affiliations with or financial interest in any commercial organization that poses a conflict of interest with the presentation on which this article is based; O'Connell discloses that she received a research grant from Merck.

REFERENCES

1. National Osteoporosis Foundation. Fast facts. Available at: <http://www.nof.org/osteoporosis/diseasefacts.htm>. Accessed April 18, 2006.
2. Hodgson SF, Watts NB, Bilezikian JP, et al., for the AACE Osteoporosis Task Force. American Association of Clinical Endocrinologists medical guidelines for clinical practice for the prevention and treatment of postmenopausal osteoporosis: 2001 edition, with selected updates for 2003. *Endocr Pract.* 2003;9:544-64.
3. National Osteoporosis Foundation. Physician's guide to prevention and treatment of osteoporosis. Available at: <http://www.nof.org/professionals/clinical.htm>. Accessed April 18, 2006.
4. Follin SL, Black JN, McDermott MT. Lack of diagnosis and treatment of osteoporosis in men and women after hip fracture. *Pharmacotherapy.* 2003;23:190-98.
5. Riley RL, Carnes ML, Gudmundsson A, Elliott ME. Outcomes and secondary prevention strategies for male hip fractures. *Ann Pharmacother.* 2002;36:17-23.
6. Gardner MJ, Brophy RH, Demetarakopoulos D, et al. Interventions to improve osteoporosis treatment following hip fracture. A prospective, randomized trial. *J Bone Joint Surg Am.* 2005;87:3-7.
7. Cerulli J, Zeolla MM. Impact and feasibility of a community pharmacy bone mineral density screening and education program. *J Am Pharm Assoc.* 2004;44:161-67.
8. Tosteson AN, Grove MR, Hammond CS, et al. Early discontinuation of treatment for osteoporosis. *Am J Med.* 2003;115:209-16.
9. McCombs JS, Thiebaud P, McLaughlin-Miley C, Shi J. Compliance with drug therapies for the treatment and prevention of osteoporosis. *Maturitas.* 2004;48:271-87.
10. Good moves for life: welcome to the United States bone and joint decade! Available at: <http://www.usbjd.org/>. Accessed April 24, 2006.
11. U.S. Department of Health and Human Services. Bone health and osteoporosis: a report of the Surgeon General (2004). Available at: <http://www.surgeongeneral.gov/library/bonehealth/content.html>. Accessed April 26, 2006.
12. U.S. Department of Health and Human Services. The 2004 Surgeon General's report on bone health and osteoporosis: what it means to you. Available at: <http://hhs.gov/surgeongeneral/library/bonehealth/docs/OsteoBrochure1mar05.pdf>. Accessed April 20, 2006.
13. National Committee for Quality Assurance. The Health Plan Employer Data and Information Set. Available at: <http://www.ncqa.org/programs/hedis/>. Accessed April 24, 2006.
14. Centers for Medicare & Medicaid Services. Physician voluntary reporting program: overview. Available at: http://www.cms.hhs.gov/PVRP/01_Overview.asp. Accessed April 20, 2006.