Audit of the Diagnosis, Assessment, and Treatment of Osteoporosis in Patients with Ankylosing Spondylitis

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ABSTRACT. ***Objective.*** Osteoporosis (OP) is a well recognized complication of ankylosing spondylitis (AS), but there is no clear guidance to its appropriate management. To establish what might be considered as reasonable practice we surveyed the current practice of consultant rheumatologists in the United Kingdom.

Methods. A questionnaire comprising 14 questions relating to the management of OP in AS was sent to 449 British rheumatologists. Three hundred ten (69%) of the 449 questionnaires sent were returned.

Results. Only 98 respondents (31.6%) indicated that assessment of OP formed part of their routine management. Dual energy x-ray absorptiometry (DEXA) was the technique of choice for assessing bone mineral density (BMD) for 284 (91.6%). As general treatment, dietary advice was offered by 101 (32.6%) respondents, whereas 306 (98.7%) gave advice on exercise. Two case scenarios were presented and treatment choices recorded. When faced with a patient with osteopenia (–2.5 < T score < –1.0), 168 (54.2%) respondents would prescribe calcium and vitamin D supplements and 66 (21.3%) would prescribe a bisphosphonate. A second scenario featured a man with femoral neck T score of –2.80 and lumbar spine T score of –0.23. In this case 238 (76.8%) respondents would prescribe a bisphosphonate and 99 (31.9%) calcium and vitamin D, with some prescribing both. Thirty-eight (12.3%) would not prescribe calcium and vitamin D or a bisphosphonate. Two hundred twenty-seven (88.3%) rheumatologists indicated that they would repeat the BMD measurement in a patient with OP within 2 years.

Conclusion. The majority of British rheumatologists do not routinely assess patients with AS for OP. Most would manage OP in AS in a similar way to postmenopausal OP, but many would not. It does not appear to be generally recognized that in AS, spinal BMD as measured by DEXA rises with advancing radiographic changes, so that hip BMD is the measurement of choice. A robust evidence base is required to clarify guidelines for the management of OP in AS. (J Rheumatol 2003;30:779–82)

Key Indexing Terms:
ANKYLOSING SPONDYLITIS OSTEOPOROSIS AUDIT
BONE DENSITOMETRY TREATMENT

It is now well recognized that osteoporosis (OP) is a problem in patients with ankylosing spondylitis (AS)[1-4]. Although osteoporotic fractures are usually seen late in the disease course, the process begins early[5-7]. Osteoporotic vertebral compression fractures affect up to 21% of patients with AS, at a rate more than 5 times that expected[6,8-10], and may occur silently[8,10] or with minor trauma[11]. While there are guidelines for the detection and treatment of postmenopausal OP[12,13], steroid induced OP[14], and OP associated with rheumatoid arthritis[15], there is no clear guidance to the appropriate management of OP in patients with AS.

To establish what might be considered as reasonable practice in our own unit, we surveyed the approaches of other British consultant rheumatologists in order to determine the extent to which there is consensus over this issue.

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MATERIALS AND METHODS

A questionnaire comprising 14 questions was sent to 449 British rheumatologists. Names and addresses of all consultant rheumatologists working for the British National Health Service were provided by the Arthritis Research Council. These consultants were approached without selection. Three hundred and ten (69%) of the 449 questionnaires sent were returned unspoiled.

The 14 questions dealt with the following: the number of patients with AS seen by each specialist, the facilities available for the measurement of bone mineral density (BMD), the skeletal sites used in the assessment of BMD, the proportion of patients with AS in which BMD measurements should be performed, the use of other markers of bone turnover, and the intervals at which a BMD measurement should be repeated.

In addition, 2 clinical scenarios were presented: the first involved a young woman with osteopenia and the second a middle-aged man with OP. Respondents were asked to interpret the BMD measurements and to indicate which investigations they would perform and what treatment they would offer.

RESULTS

Three hundred three (97.7%) respondents saw one or more

patients with AS each month, with 39 (12.6%) seeing more than 10 patients per month. Ninety-eight (31.6%) indicated that the assessment of the presence of OP formed part of their routine management.

When asked to indicate which facilities were available for the measurement of BMD, 275 (88.7%) had access to dual energy X-ray absorptiometry (DEXA), 51 (16.5%) had access to quantitative computerized tomography (QCT), and 44 (14.2%) to quantitative ultrasound. Fifty (16.1%) of these consultants indicated that access to DEXA was limited either because tests were carried out at a neighboring trust or because facilities were only available privately. No information was sought as to rationing of test availability.

For 284 (91.6%) respondents, DEXA was the technique they used in practice for assessing BMD. Thirty-one (10%) used QCT and 19 (6.1%) quantitative ultrasound. Of the 292 respondents who specified which skeletal sites they used in assessment, 272 (93.2%) used the lumbar spine and femoral neck, but 18 (6.2%) routinely assessed BMD at the lumbar spine only.

When asked, "In what proportion of your AS patients would you perform BMD measurements," 218 (70.3%) indicated that they would perform a BMD measurement in some of their existing patients with AS and 155 (50%) in some of the newly diagnosed patients. Among those performing BMD measurements in their existing patients, 147 (67.4%) took measurements in up to 25% of these patients. Of the 155 who performed a BMD measurement on some of their new patients, 112 (72.3%) indicated that they would do so in up to 25% of new patients, with 10 (6.5%) indicating that they would do so in all new patients. Sixty-two (20%) respondents would not measure BMD in any patient.

One hundred one (32.6%) respondents gave some dietary advice to patients with AS whereas 306 (98.7%) gave advice on exercise.

Two questions addressed the management of osteopenia and hip OP. Presented with a 30-year-old woman with a T score of between –2.5 and –1.0, 269 (86.8%) and 252 (81.30%) respondents would measure serum calcium and total alkaline phosphatase, respectively. One hundred twenty-one (39%) would measure vitamin D levels and 78 (25.2%) would measure parathyroid (PTH) hormone levels. Only 2 (0.6%) would measure osteocalcin and 9 (2.9%) urinary hydroxyproline. One hundred sixty-eight (54.2%) respondents would prescribe calcium and vitamin D supplements for this individual, while 66 (21.3%) would prescribe a bisphosphonate. Ninety-nine (31.9%) would not prescribe calcium and vitamin D or a bisphosphonate. Two hundred four (65.8%) would prescribe an exercise regimen.

The second case was that of a 48-year-old man with advanced spondylitis and femoral neck T score of –2.80. The lumbar BMD was apparently normal with a T score of –0.23. Two hundred seventy-one (87.4%) and 252 (81.3%) respondents would measure calcium and total alkaline phosphatase, respectively. One hundred twenty-six (40.6%) and 89 (28.7%) would measure vitamin D and PTH, respectively. Two hundred fourteen (69.0%) would measure testosterone levels, but only 5 (1.6%) and 12 (3.9%) would measure osteocalcin or urinary hydroxyproline, respectively. Two hundred thirty-eight (76.8%) respondents would prescribe a bisphosphonate and 99 (31.9%) calcium and vitamin D, with some prescribing both. Thirty-eight (12.3%) would not prescribe calcium and vitamin D or a bisphosphonate. Sixteen (5.2%) would prescribe hormone replacement therapy and only 158 (51.0%) would advocate an exercise regimen.

Only a very small proportion of rheumatologists use additional markers of OP. Eleven (3.5%) use urinary cross-linking C- and N-terminal telopeptides of type 1 collagen and 14 (4.5%) urinary pyridinium cross-links of collagen. Fourteen (4.5%) measure urinary fasting calcium.

The final 2 questions addressed the issue of in whom and when to repeat the bone density measurement. One hundred twenty (38.7%) would subsequently repeat a bone density measurement in a patient who had a normal density result. Two hundred fifty-five (82.3%) would perform a repeat bone density measurement in a patient with a T score between –2.5 and –1.0 and 257 (82.9%) would repeat the measurement in an individual with a T score < –2.5. There was no real consensus when the measurement should be repeated in individuals with a normal bone density, although 56 of 120 (46.7%) respondents who would repeat it would do so after 5 years. When the initial T score was between –1.0 and –2.5, 45 (17.6%) would repeat the measurement at one year, 130 (51.0%) at 2 years, and 66 (25.9%) at 3 years (Figure 1). When the initial T score was < –2.5, 97 (37.7%) would repeat the measurement at one year and 130 (50.6%) at 2 years. Thirty (11.7%) respondents would repeat the measurement at longer intervals.

The mean responses showed that BMD would be repeated after 3.65 years if initial T scores indicated normal values, after 2.24 years if initial osteopenic values were found, and after 1.76 years if initial osteoporotic values were found.

DISCUSSION

It is clear that there is little consensus among British rheumatologists as to how to manage AS related osteoporosis. In light of published guidelines in postmenopausal and steroid induced OP, it is surprising that there is such a diversity of opinions. We were particularly surprised that at most one in 4 AS patients would be likely to be offered a BMD measurement, that treating osteopenia with vitamin D and calcium is not generally seen to be essential, and that treating OP with vitamin D and calcium alone is seen by many rheumatologists to be acceptable clinical practice.

The responses to our questionnaire showed that there is a

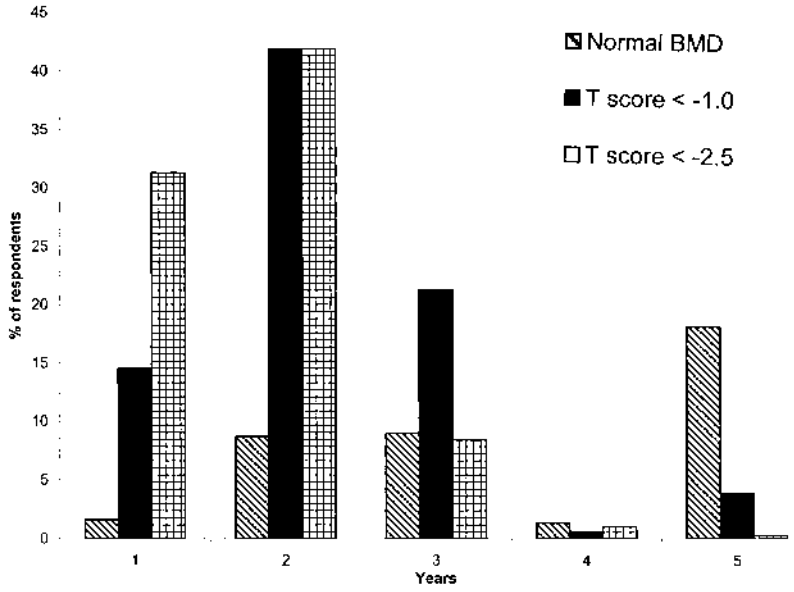

Figure 1. The interval between repeat BMD measurements proposed by the respondents for each of the scenarios.

measure of consensus regarding the following: (1) Most rheumatologists use DEXA for measuring bone density, although 16% either have no access to this or have to use services of another hospital or trust. (2) Eighty percent of rheumatologists would measure bone density in some patients with AS. However, the majority would do so in fewer than one in 4 of their new or followup patients. Twenty percent would not measure it at all. (3) More than 80% of rheumatologists would measure calcium and alkaline phosphatase levels in patients who are either osteopenic or osteoporotic. Far fewer would measure vitamin D and PTH levels and measurements of osteocalcin and urine hydroxyproline levels are little used. In the presence of hip OP, 13% of respondents would not investigate further, and even in this group less than one-third (28.7%) of respondents would measure vitamin D and PTH levels. (4) Approximately half (54%) of respondents would treat osteopenia with vitamin D and calcium, 32% would use vitamin D and calcium supplementation alone in the presence of OP, 21.3% would treat the osteopenic patient with a bisphosphonate, whereas 77% would treat the osteoporotic patient with these agents. Only 33% would give advice on diet, and while almost all respondents would advocate an exercise program generally, only 51% saw this as relevant to the management of OP. (5) Sixty-nine percent of respondents would check for hypogonadism in the osteoporotic man by measuring plasma testosterone levels. (6) Other markers of OP including urine type 1 collagen telopeptides and urine pyridinium cross-links of collagen are not widely used.

There is no clear consensus as to when BMD measurements should be repeated. Most (61%) respondents would not repeat BMD if the initial test was normal. In the presence of osteopenia, 82% would repeat the measurement, mostly at 2 or 3 years. The position is similar when the initial measurement indicated OP. The responses relating to intervals between the initial and followup BMD measurements are presented in Figure 1. The question of further followup assessments was not addressed.

Our survey also revealed that some clearly established findings are disregarded in managing this condition. It does not appear to be generally recognized that spinal BMD, as measured by DEXA, rises with advancing radiographic changes, so that hip BMD may give more clinically relevant information[10,16-18]. Since bone loss occurs early in the course of disease[5-7] there may be logic to assessing BMD early and in new referrals.

There is no doubt that we need to build a robust evidence base so that clear guidelines on the management of OP in AS can be constructed. However, it would appear that there is also a need to improve the education of rheumatologists about the management of OP in general.

REFERENCES

1. El Maghraoui A, Borderie D, Cherruau B, Edouard R, Dougados M, Roux C. Osteoporosis, body composition, and bone turnover in ankylosing spondylitis. J Rheumatol 1999;26:2205-9.
2. Hanson CA, Shagrin JW, Duncan H. Vertebral osteoporosis in ankylosing spondylitis. Clin Orthop Rel Res 1971;74:9-64.
3. Reid DM, Nicoll JJ, Kennedy NS, Smith MA, Tothill P, Nuki G. Bone mass in ankylosing spondylitis. J Rheumatol 1986;13:932-5.

4. Szejnfeld VL, Monier-Faugere M-C, Bignar BJ, Ferraz MB, Malluche HM. Systemic osteopenia and mineralization defect in patients with ankylosing spondylitis. J Rheumatol 1997;24:683-8.
5. Will R, Palmer R, Ring F, Calin A. Ankylosing spondylitis is associated with marked osteopenia of the lumbar spine and femoral neck in patients with mobile spines and hips. Br J Rheumatol 1989;28 Suppl 1:19.
6. Mitra D, Elvins DM, Speden DJ, Collins AJ. The prevalence of vertebral fractures in mild ankylosing spondylitis and their relationship to bone mineral density. Rheumatology 2000;39:85-9.
7. Will R, Palmer R, Bhalla AK, Ring F, Calin A. Osteoporosis in early ankylosing spondylitis: A primary pathological event? Lancet 1989;2:1483-5.
8. Ralston SH, Urquhart GDK, Brzeski M, Sturrock RD. Prevalence of vertebral compression fractures due to osteoporosis in ankylosing spondylitis. BMJ 1990;300:563-5.
9. Cooper C, Carbone L, Michet C, Atkinson E, O'Fallon W, Melton L. Fracture risk in patients with ankylosing spondylitis — a population-based study. J Rheumatol 1994;21:1877-82.
10. Donnelly S, Doyle DV, Denton A, Rolfe I, McCloskey EV, Spector TD. Bone mineral density and vertebral compression fracture rates in ankylosing spondylitis. Ann Rheum Dis 1994;53:117-21.
11. Hunter T, Dubo H. Spinal fractures complicating ankylosing spondylitis. Arthritis Rheum 1983;26:751-9.
12. Hodgson SF, Watts NB, Bilezikian JP, et al. American Association of Clinical Endocrinologists 2001 medical guidelines for clinical practice for the prevention and management of postmenopausal osteoporosis. Endocr Pract 2001;7:293-312
13. Osteoporosis — clinical guidelines for prevention and treatment. Royal College of Physicians of London, 1999. ISBN 1860160794.
14. Recommendations for the prevention and treatment of glucocorticoid-induced osteoporosis. American College of Rheumatology Task Force on Osteoporosis Guidelines. Arthritis Rheum 1996;39:1791-801.
15. Sewell K, Schein JR. Osteoporosis therapies for rheumatoid arthritis patients: minimizing gastrointestinal side effects. Semin Arthritis Rheum 2001;30:288-97.
16. Devogelaer J-P, Dufour J, Huaux J, Nagant de Deuxchaisnes C. Appendicular and spinal bone mass in ankylosing spondylitis. Clin Rheumatol 1984;3:105.
17. Singh A, Bronson W, Walker SE, Allen SH. Relative value of femoral and lumbar bone mineral density assessments in patients with ankylosing spondylitis. South Med J 1995;88:939-43.
18. Bronson WD, Walker SE, Hillman LS, Keisler D, Hoyt T, Allen SH. Bone mineral density and biochemical markers of bone metabolism in ankylosing spondylitis. J Rheumatol 1998; 25:929-35.