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Risk of vertebral fracture in women with rheumatoid arthritis

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Rheumatoid arthritis commonly affects postmenopausal women, and osteoporosis and resultant fractures may contribute to the morbidity of the condition.[1] No large case-control studies have assessed the rates of vertebral fracture in a standardised manner. We compared women with rheumatoid arthritis with population controls for the presence of vertebral fractures.

Subjects, methods, and results

The cases were drawn from 191 postmenopausal women aged 45-65 with rheumatoid arthritis who consecutively attended clinics in five London hospitals. All were white, were not taking replacement oestrogens, and had agreed to have their bone density measured before entering a drug study. They were asked if additional radiographs of the spine could be taken, and 149 (78%) agreed. The controls were 713 postmenopausal women aged 45-65 not taking hormone replacements. They were obtained from the age-sex register of a large general practice in London, and those who responded (77%) were similar to the national average in height, weight, and smoking habits. The socioeconomic status of the women was estimated from their postcode (ACORN classification system).

Radiographs of the women's lateral thoracic and lumbar spine were taken in a standardised manner. They were examined with a semiautomated morphometric technique with high specificity[2] by a single, blinded observer using a digitising board, and anterior, central, and posterior heights were recorded. The predicted posterior height for each vertebra was calculated from four adjacent vertebrae, and an algorithm compared the ratios with normal ranges of vertebral heights from T4 to L4. A woman was classified as having a fracture if she had at least two minor deformities (reduction of two vertebral height ratios by at least 2 SD) or a single severe deformity (reduction of two vertebral height ratios by at least 3 SD). The arthritic women were also assessed for disease activity and bone mineral density (at the hip and spine, with a dual energy x ray absorptiometer). Differences between the groups were assessed with the χ^2 test for proportions and unpaired t tests (after log transformation of non-normal distributions). Odds ratios were calculated for the risk of fracture in the arthritic women.

The cases and controls were similar in age, years since the menopause, and weight (table). Most controls were from lower to mid-middle class, while the cases had a greater spread of social class. Eighteen arthritic women (12·1%) had a vertebral fracture compared with 44 (6·2%) of the controls (odds ratio 2·1 (95% confidence interval 1·2 to 3·7)).

Among the arthritic women five (28%) of those with a fracture had used steroids (mean dose 10·8 mg/day for 8·9 years) compared with 46 (35%) of those without a fracture (7·9 mg/day for 4·3 years). Those with fractures were older (59·0 v 56·3 years, p=0·02) and more likely to have smoked (10/18 (56%) v 39/126 (31%), p=0·04) (table). No significant differences were found in height, weight, disease activity, duration of disease, socioeconomic class, or years since the menopause. Bone density was lower, but not significantly, in the women with fractures (by 4·9% in the lumbar spine and by 9·9% at the hip). Results were similar when only severe fractures were analysed.

Comment

The rate of vertebral fracture in the women with rheumatoid arthritis was over twice that in the controls. The only other large studies with controls examined hip fractures and rheumatoid arthritis and found odds ratios of 1·5 and 2·1.[3][4] These results suggest that there is an increased risk of osteoporotic fractures at the spine and hip. In our study bone densities were not uniformly low at all sites, and fractures cannot easily be explained by the use of steroids or disease activity. Ankylosing spondylitis is also associated with increased rates of vertebral fracture.[5] The prevalence of vertebral fractures in women with rheumatoid arthritis aged over 65 is probably higher than the 12% found in the younger women in this study, and clinicians should be aware of the possibility of vertebral fractures in all patients with rheumatoid arthritis.

Characteristics of postmenopausal women with and without rheumatoid arthritis and with and without vertebral fractures. Figures are means (SD) unless stated otherwise

	Arthrtic women		Controls (n=713)
	With vertebral fracture (n=18)	Without vertebral fracture (n=131)	
Age	59·0 (4·3)*	56·3 (4·8)	56·0 (5·2)
Years since menopause	10·6 (7·3)	7·9 (5·8)	8·6 (5·8)
Weight (kg)	63·2 (11·4)	64·9 (12·1)	67·1 (11·7)
No (%) who had undergone hysterectomy	3 (16·7)	22 (16·8)	208 (29·2)
No (%) who had ever smoked	10 (55·5)	39 (30·9)†	332 (46·6)
Bone mineral density (g/cm²):			
L_1-L_4	0·89 (0·4)	0·92 (0·16)	
Neck of femur	0·64 (0·13)	0·71 (0·15)	
Indicators of disease activity:			
Erythrocyte sedimentation rate	32·9 (27·6)	33·5 (24·5)	
Articular index	9·4 (8·5)	10·7 (8·7)	
Score on health assessment questionnaire	1·5 (1·0)	1·4 (0·9)	
Duration of disease (years)	13·9 (10·7)	11·5 (9·7)	

*p<0·05 Compared with arthritic women without fracture (t test).
†No data for five cases.

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