

## Sequential study of bone mineral density in patients with systemic lupus erythematosus

A loss of bone mineral density has been reported<sup>1-3</sup> in premenopausal women with systemic lupus erythematosus (SLE), but its pathogenesis is uncertain.<sup>4</sup> Studies on the sequential changes in bone mass in these patients are scarce.<sup>3,5</sup>

Recently, we studied 74 premenopausal women with SLE without any complications or treatment (except for glucocorticoids) that could interfere with bone mineral density.<sup>2</sup> We excluded nine osteoporotic patients according the established World Health Organisation criteria,<sup>6</sup> because they were on treatment for low bone density. We repeated the measurement of bone mass after 18 months in 25 consecutive patients, all of whom had continued on glucocorticoid treatment during this period.

Bone mineral density was measured in the lumbar spine (L2-L4) and femoral neck (FN) by dual energy x ray absorptiometry (DXA), using a densitometer (Hologic QDR 1000). Measurement of the bone mineral content, calibrating with the Hologic X-calibre QDR-1 anthropomorphic spine phantom of the known mineral content, was accurate to 0.5%. The precision measurement was better than 0.01 g cm<sup>-2</sup> (coefficient of variation = 1.0% at bone mineral density 1.0 g cm<sup>-2</sup>). Disease activity was assessed with the University College Hospital/Middlesex SLE scoring system,<sup>7</sup> by a numerical score graded from 1 to 4 (inactive to severely active disease).

The results were expressed as the mean (SD). For all conventional analyses we used the SPSS/PC software package. A *t* test was used and the correlations were calculated by linear regression analysis. Results were considered significant at *P* < 0.05.

At the time of the first densitometry, the mean age was 31.7 (6.8) years, and disease duration was 91 (64) months.

After 18 months there was no significant decrease in bone mineral density, despite glucocorticoid treatment (table), in either the lumbar spine or the femoral neck. No fractures were found. Serum calcium, phosphorus, creatinine, and alkaline phosphatase, and 24 hour urine calcium and phosphorus did not change during this period.

Using linear regression, there was no correlation between bone mineral density or changes in bone mineral density and the prednisone dose (cumulative and baseline). We found no correlation between disease duration or mean disease activity grade and bone mineral density. No other correlations with bone mineral density were found.

This study shows that in premenopausal SLE patients lumbar and femoral bone min-

eral density did not change with respect to baseline values after 18 months, despite continuous glucocorticoid treatment (the mean dose was 9.2 mg/day during the 18 months). Recently, Pons *et al*<sup>3</sup> reported similar results in a study of 31 premenopausal women followed for a mean of 36.6 months. Kalla *et al*<sup>5</sup> also found no changes in bone mineral density in 56 SLE patients over 18 months.

The effect of glucocorticoids on SLE osteoporosis is controversial.<sup>1-3</sup> We did not find any correlation between prednisone dose and bone mineral density in chronic steroid users. The effects of glucocorticoids on the bone mass are most pronounced early in the course of steroid treatment.<sup>8,9</sup> These data may partly explain our results. Also, a multifactorial action could explain the lack of correlation between the dose of glucocorticoids and bone mineral density. Glucocorticoids may paradoxically inhibit bone resorption that has been stimulated by PGE<sub>2</sub> or cytokines.<sup>10,11</sup>

In conclusion, after 18 months there were no significant decreases in bone mineral density in premenopausal SLE patients on glucocorticoid treatment. The reported reduction in bone mineral density in these patients may occur at the onset of the disease. Nevertheless, future studies to demonstrate a small loss of bone mineral density in SLE will probably require more patients and a longer period of study.

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## MATTERS ARISING

### Unilateral Heberden's nodes in a case of Erb-Duchenne paralysis

Referring to the letter by Etherington and Spector ("Asymmetrical nodular osteoarthritis in a patient with a hemiparesis", *Annals of the Rheumatic Diseases*, November 1995, p 936), we would like to offer a contribution based on our recent experience.

Although Stecher and Karnosh<sup>1</sup> assert that apparent involution of Heberden's nodes on the hemiplegic side should be attributed exclusively to the effects of a reduction of soft tissues, in spite of the existence of x ray nodes, Forestier,<sup>2</sup> Hench and McEwen,<sup>3</sup> and Thompson and Bywaters<sup>4</sup> suggest a "neurogenic protection" against nodes on the affected side.

This particular characteristic of Heberden's and Bouchard's nodes, was pointed out both in hemiplegic subjects following a central cerebral lesion—as in the case of Etherington and Spector<sup>2</sup>—or in upper limbs affected by peripheral paralysis (obstetric paralysis or traumatic interruption of a nerve).

Our case is a 45 year old female who presented with Erb-Duchenne paralysis and Heberden's nodes limited to the healthy side, while the affected arm shows a lack of musculoskeletal development (radius, ulna, carpus, metacarpus, and phalanges) (figure).

In analogy with what has been pointed out in the case of rheumatoid arthritis and hemiplegia<sup>6,7</sup> it is possible formulate several hypotheses:

- (1) A protective action of central or peripheral neurological lesions with respect to osteoarthritic or arthritic<sup>8</sup> manifestations on the affected side, through interruption of the central reflex arc, which is responsible for the symmetric lesions in rheumatoid arthritis and osteoarthritis.
- (2) Attenuation of superimposed inflammation in osteoarthritis by the conditioning of the biochemical expression of the neurogenic inflammation (mediated by substance P, a neuropeptide which acts specifically at low concentrations on "formyl peptide" receptors; this leads to the activation of polymorphonuclear cells and is present both early and in large quantities in inflamed synovium).<sup>9</sup>
- (3) Not be ignored, in our opinion, is the physiological decline of the proprioception in subjects of advancing age<sup>10</sup> and the absence of the normal proprioceptive stimuli linked to the "microtraumatic" use of the hands which is limited only to the affected hand. Such absence is also presumably responsible for lack of node production related to enthesitic ossification at the distal phalanx level.

We agree with Etherington and Spector<sup>5</sup> about the possibility that several valid concepts relating to the protective effects of neurological lesions, either central or periph-

#### Characteristics of 25 patients at baseline and after 18 months

	Baseline (mean (SD))	18 months (mean (SD))
L2-L4 (g cm <sup>-2</sup> )	1.00 (0.09)	1.00 (0.1)*
F. neck (g cm <sup>-2</sup> )	0.80 (0.07)	0.79 (0.08)*
P. baseline (mg)	17 (2)	16 (9.4)
P. cumulative (g)	35 (2)	41 (5)
Activity grade	2.47 (0.4)	2.41 (0.5)

\* All *P* values > 0.05 versus baseline.



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