

## HISTOMORPHOMETRIC STUDY OF ACUTE OSTEOPOROSIS IN PARAPLEGIC PATIENTS\*

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**Abstract.** Biopsies of the iliac crest bone of 65 paraplegic patients were studied after various periods of immobilisation. The histomorphometric study included measurement of the trabecular bone volume (TBV), the relative osteoid volume, the surfaces of osteoclastic resorption, the number of osteoclasts per mm<sup>2</sup>, the size of the periosteocytic lacunae, and the adipose marrow tissue volume. The decrease of the TBV reached 33 per cent of the control values, over a period of six months, and remained at this level. Tetracycline double-labelling showed a decrease in the calcification rate. An increase in osteoclastic resorption was observed, and a decrease in the osteoid volume. After six months, a new steady state was obtained, with osteoclastic resorption and osteoid volume at normal values. There was a 75 per cent increase in adipose tissue of the marrow between zero and six months. Calciuria and hydroxyprolinuria were elevated during the first six months, with peaks respectively at one week and ten weeks.

Thus, our study shows that there is an acute and early osteoporosis in spinal cord injury patients, due to increased osteoclastic resorption, and decreased bone formation. This creates a temporary negative bone balance, leading to bone loss. These changes are triggered by the vascular modifications and maintained by the loss of mechanical stress, especially muscular periosteal traction and axial loading. There is no suggestion of spontaneous recovery in the latest results.

It appears likely that drug treatment can be beneficial, such as Calcitonin and diphosphonates, but these are still under investigation. The best 'treatment' is prevention, which should be instituted as early as possible.

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