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VITAMIN K₁ LEVELS IN PROXIMAL FEMORAL FRACTURES: BRIEF REPORT

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There is still controversy as to whether the two types of proximal femoral fractures have different aetiology or pathogenesis. Recently, in studying the detailed structure of bone, it was shown that, with subcapital fractures, the orientation of the proteoglycans at the fracture site was abnormal (Kent et al. 1983); however, with trochanteric fractures, the same abnormality was found at the site of the fracture (Ferris et al. 1987).

In seeking other potential differences between these fractures, attention was focused on the abnormally low circulating levels of vitamin K₁ in patients with subcapital and spinal crush fractures (Hart et al. 1985). Vitamin K₁ is involved in the γ -carboxylation of glutamic acid residues in osteocalcin and other bone Gla-proteins (Price 1983) which are required for the binding of calcium for mineralisation. It therefore seemed relevant to test whether or not a similar circulating deficiency of vitamin K₁ occurred in patients with trochanteric fractures.

Samples of blood (20 ml) were taken within 48 hours from nine patients who had sustained trochanteric fractures (as detailed in Table 1). The plasma was separated and assayed for vitamin K₁ content by electrochemical detection after separation by high performance liquid chromatography (Hart et al. 1985). The mean value was 59 pg/ml (range, 20 to 110 pg/ml).

In a control group of 15 patients of comparable age and sex, the circulating level measured by the same procedure was 335 (range, 284 to 386 pg/ml). This depressed level was comparable to that in patients who sustained subcapital fractures. Thus, with respect to the deficient circulating levels of this bone-forming vitamin, as with the defective orientation of the proteoglycans, trochanteric fractures closely resemble subcapital fractures.

Table 1. Circulating vitamin K₁ levels

Proximal femoral fractures	Number	Age in years (range)	Sex ratio (M:F)	Mean level $\pm$ s.e.m. (pg/ml)
Trochanteric	9	84 (65-100)	3:6	59 $\pm$ 13
Subcapital*	14	77 (63-83)	1:13	71 $\pm$ 9
Control*	15	63 (51-81)	5:9	335 $\pm$ 51

* From Hart et al. 1985.

We acknowledge the help given us by Dr Lucille Bitensky and Dr J. Chayen of the Division of Cellular Biology, Kennedy Institute of Rheumatology, London. One of us (BDF) is grateful to the Wellcome Trust for a Fellowship for this work; JPH is grateful to the Arthritis and Rheumatism Council for Research for support.

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© 1988 British Editorial Society of Bone and Joint Surgery
0301-620X/88/2R52 \$2.00
J Bone Joint Surg [Br] 1988;70-B:286.