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BONE

Vitamin D metabolites and fracture healing

The levels of 24R,25-dihydroxyvitamin D (24R,25[OH]$_2$D) in serum do not vary following long bone fracture in humans, show the results of a new cohort study.

"24R,25(OH)$_2$D had classically been regarded as an inactive 'waste product' of vitamin D metabolism," explains study researcher Adrian Martineau. However, the observation that 24R,25(OH)$_2$D concentrations are sharply increased in chicks with recent fracture of the tibia suggested that this vitamin D metabolite could have a role in fracture healing.

Aiming to find out whether similar changes occur in humans, the investigators studied 28 patients (median age 50 years) who presented at the Accident and Emergency Department of the Royal London Hospital with diaphyseal long bone fracture. The concentrations of several vitamin D metabolites and other bone-related substances were measured 48 h, 1 week and 6 weeks after a fracture had occurred. Serum levels of 1,25-dihydroxyvitamin D decreased and serum calcium levels increased from baseline, but serum 24R,25(OH)$_2$D levels did not change.

"The phenomenon of peaking serum 24R,25(OH)$_2$D concentration post-fracture may be more apparent in children and young adults, who make more callus (heterogeneous tissue containing chondroblasts and osteoblasts that forms at the site of a healing fracture) than older adults," says Martineau, who plans to repeat the study in young patients. "If true, this finding might lead to the development of vitamin D analogues to reduce the risk of failed fracture healing, which complicates 10% of long bone fractures."

Joana Osório

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