

Introduction

Chronic renal failure is associated with specific abnormalities of skeletal homeostasis, commonly called renal osteodystrophy (ROD), which if not treated appropriately during the critical phases of skeletal growth can result in bone deformities and a disturbed growth pattern (*Klaus et al., 2006*).

Renal osteodystrophy represents a spectrum of skeletal lesions that range from high-turnover to low-turnover bone disease. Similar factors are involved in the pathogenesis of renal osteodystrophy in adult and pediatric patients with chronic kidney disease (CKD). However, growth retardation and the development of bone deformities are specific complications that occurred in pediatric patients with CKD (*Saluskya et al., 2004*).

The clinical markers of renal bone disease to be prevented are signs of overt rickets, slipped femoral epiphysis and disturbances of growth. The biochemical markers are plasma phosphate, calcium, alkaline phosphatase, bicarbonate and intact parathyroid hormone (PTH). The minimal frequency of measurements (and target ranges) for biochemical markers in a stable phase vary according to renal function. If the patient has active ROD, additional blood samples may be required (*Oh et al., 2002*).

Radiological signs of renal bone disease, which alone are not sensitive enough to indicate therapy-adaptations, include signs of hyperparathyroidism and growth zone lesions. Periosteal resorption zones and metaphyseal changes are the most obvious signs (*Watson and Gartland, 2001*).

In children with chronic renal failure, hyperphosphatemia is observed at GFR levels below 40 ml/min/1.73m² and almost always in children on dialysis. Hyperphosphatemia has several deleterious effects on PTH secretion, parathyroid cell proliferation and soft tissue (vascular) calcification (*Norman et al., 2000*).

Phosphate binders are necessary to reduce phosphate absorption from the gut. Calcium containing phosphate binders, i.e., calcium carbonate (CaCO_3 , elemental calcium content 40%) or calcium acetate (CaAc, elemental calcium content 25%) should be used as the first line (*Amann et al., 2003*).