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PITFALLS IN THE ANALYSIS OF SERUM OSTEOCALCIN IN CHILDHOOD RENAL OSTEODYSTROPHY

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Osteocalcin, a small (5.8-kDa) protein containing 3 γ -carboxy glutamic acid sites whose gene lies at 1q 25-q31, is exclusively found in osteoblasts. Hence, during bone formation, such as occurs in infancy and the adolescent growth spurt, serum osteocalcin (OC) values rise. It can serve as a biochemical marker of bone metabolism that indicates bone formation. Since OC correlates with PTH measurements in some studies, it is relevant to evaluate OC values at various stages of decline renal function, with various bone lesions in renal osteodystrophy (ROD), and in relation to other biomarkers. While some studies show that OC correlates with PTH and AP [Baskin; Polak-Jonkisz (03,02), Coen 85], other groups fail to show a correlation between OC and PTH or bone formation rate (BFR) (Piscitelli 99; Deschenes 90, Zwolinska 04). Correlation between BFR and OC and PTH and OC are poor in patients with adynamic bone disease, those undergoing hemodialysis, or post renal transplantation. Additional problems include age-related changes in OC, issues of diurnal variability and the fact that a small molecule such as OC which undergoes renal metabolism and excretion, can be difficult to interpret with impaired renal clearance.

In general, OC is not as useful as either AP or PTH as a marker of ROD in children, especially since results in children with chronic renal insufficiency have been inconsistent or failed to show correlation with PTH or BFR.