

Highest Serum Calcium Observed with Lowest 1-84 PTH/7-84 PTH Ratio

A. Ashfaq¹, R. Mossey¹, A. Bellucci¹, I. Miller¹, and S. Latcha¹. ¹Nephrology, North Shore University Hospital, Manhasset, NY, USA.

Serum calcium is demonstrated to be an independent mortality factor in ESRD. It is supposed that hypercalcemia leads to soft tissue calcification and cardiac infarction. It can be stated that the goal of the K/DOQI bone guidelines is to reduce mineral metabolism disturbances that lead to soft tissue calcification and cardiac complications. It is recognized that the most significant factor leading to both renal bone disease and disturbances in mineral metabolism is PTH. The question persists: Which is the best PTH test? It has been shown that the intact PTH assay measures not only 1-84 PTH, but also 7-84 PTH, which has been demonstrated to be a potent inhibitory hormone compared to 1-84 PTH. Thus, the 1-84 PTH/7-84 PTH ratio was proposed as an improvement in the diagnosis of renal bone status. Bone biopsies have confirmed that the ratio is more diagnostically accurate compared to both the measurement of so called, "intact" PTH and the more specific 1-84 PTH assays. Ratios of less than 1.4 have been demonstrated to be associated with adynamic bone disease. Ratios of 1.4-2.0 have been associated with normal bone turnover. Ratios of greater than 2.0 have been associated with high bone turnover disease. When bones are in an adynamic turnover state, it is presumed that they are not able to utilize calcium. Therefore, one would expect to see increased hypercalcemia in patients with adynamic bone disease. For this reason we examined the average calcium levels in 1013 specimens divided as follows: 350 with ratios of <1.4, 340 with ratios of 1.4-2.0 and 323 with ratios >2.0. The average calcium value for specimens with ratios corresponding to adynamic bone disease was 9.13. In like manner the average calcium level for the ratio range corresponding to normal bone turnover was 8.74 and the average calcium level for ratios corresponding to high bone turnover was 8.42. This data is in keeping with the premise that adynamic bone disease, as assessed with the ratio, renders the bones unable to utilize calcium, evidence of which can be seen in hypercalcemia. It cannot be assumed that soft tissue calcification will be indicated by serum hypercalcemia. Nevertheless, hypercalcemia is reasonably assumed to be an indicator of the inability of the bones to utilize calcium.

Ashfaq A, Mossey R, Bellucci A, Miller I, Latcha S. Highest Serum Calcium Observed with Lowest 1-84 PTH/7-84 PTH Ratio. *J Am Soc Nephrol* 2004; 15(10):F-P1006, p. 285A.