

Superior Assessment of Bone Turnover in ESRD Patients by the 1-84 PTH/Large C Terminal PTH Fragments Ratio – A Bone Biopsy Study

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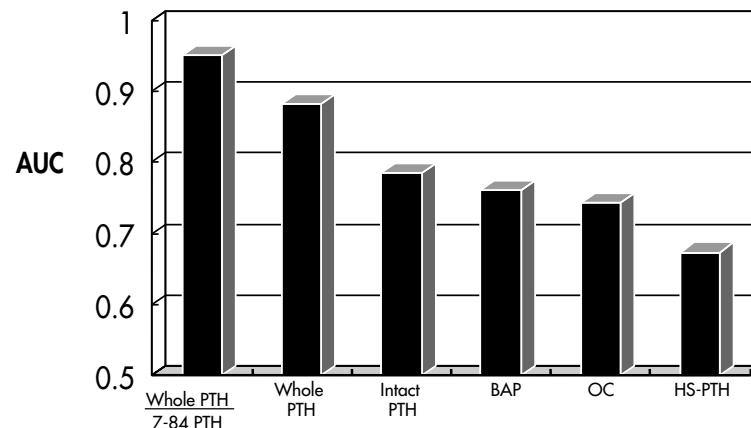
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Faugere et al reported that a 1-84 PTH/C Terminal PTH fragments ratio cutoff of 1.0 discriminates patients with adynamic low bone turnover (ratios <1.0) from patients with high or normal bone turnover (ratios >1.0) with 93% predictability (Kidney Int. 2001; 60:1460-1468.) However, one limitation of their study was that it was made up of patients who were naive to agents known to affect bone turnover. There is a need to determine the ratio cutoff for routine dialysis patients, most of whom are treated with agents known to affect bone turnover. Recently, Malluche has reported that routine dialysis patients with higher ratios also have adynamic low bone turnover disease. This study involved bone biopsies from 25 routine dialysis patients. Histological examination revealed 16 patients with low bone turnover and 9 patients with normal or high bone turnover disease. Two pts were on Vitamin D treatment. Following standard double tetracycline labeling, a fine gauge needle was used to obtain the vertical iliac sample. Low bone turnover was defined as $BFR/BS < 10 \text{ mcm}^3/\text{mcm}^2/\text{yr}$ (Calcif Tissue Int. 1988; 42:13-17). From ROC analysis we determined the utility of various biochemical markers to predict bone turnover and found the ranking, from best to worst, as follows: Ratio, 1-84 PTH, intact PTH, bone alkaline phosphatase, osteocalcin, HS-PTH. To determine the ratio cutoff value for low bone turnover, Youden index rises with a peak of 1.4. Interestingly, two pts treated with Vitamin D had both low turnover bone and their ratios were less than 1.4.

It is important to note that our bone histology study confirmed the findings of Malluche in terms of the ratio being the best indicator of bone turnover.

Ranking by Area Under Curve (AUC) of Receiver Operator Characteristics (ROC)

Low turnover bone defined as $BFR/BS < 10 \text{ mcm}^3/\text{mcm}^2/\text{yr}$ (Calcif.Tissue Int,1988;42:13-17)



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