

Usefulness of whole PTH assay in patients with renal osteodystrophy —Correlation with bone scintigraphy

Hayato KAIDA,* Masatoshi ISHIBASHI,* Hidemi NISHIDA,** Kenkichi BABA,*
Yuji HIROMATSU,*** Seiya OKUDA** and Naofumi HAYABUCHI*

**Division of Nuclear Medicine, PET Center and Department of Radiology,*

***Department of Nephrology and Dialysis Unit, and ***Department of Endocrinology and Metabolism,
Kurume University School of Medicine*

Objective: Intact parathyroid hormone (PTH) assay has recently been reported to be effective in evaluating both 1-84 PTH (whole PTH) and inactive 7-84 PTH. Inactive 7-84 PTH is considered to be increased in hemodialysis patients and to prevent the effects of 1-84 PTH, and intact PTH is considered to overestimate the PTH activity in these patients. As such, a whole PTH assay has recently been developed. The purpose of this study was to examine the usefulness of a whole PTH assay using the bone to soft tissue (B/ST) ratio on bone scintigraphy. **Method:** Twenty-five hemodialysis patients were included in our study. In all patients, bone scintigraphy and a blood test [whole PTH, intact PTH, alkaline phosphatase (ALP), calcium (Ca), and phosphorus (P)] were performed. Regions of interest (ROIs) were drawn around the cranium, lumbar vertebrae, left femoral neck, and soft tissue of the medial left thigh to obtain the B/ST ratio. **Results:** The B/ST ratio of the cranium and left femoral neck correlated with whole PTH and intact PTH. In particular, the B/ST ratio of the cranium correlated most significantly with the value of whole PTH. Whole PTH levels correlated with intact PTH levels ($r = 0.891$, $p < 0.0001$). **Conclusion:** Our data indicate that a whole PTH assay may be useful in evaluating PTH activity using the B/ST ratio. The B/ST ratio of the cranium may reflect the bone metabolism of hemodialysis patients.

Key words: ^{99m}Tc -hydroxy-methylene-disphosphonate (^{99m}Tc -HMDP), bone scintigraphy, whole parathyroid hormone (whole PTH), intact parathyroid hormone (intact PTH)