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INTRODUCTION: The amino-terminal propeptide of type I procollagen (PINP) is considered as the reference bone formation marker by the IOF/IFCC. It circulates in different forms, a larger intact trimeric form and several fragment monomers. In healthy individual, circulating PINP is predominantly the trimeric intact with almost non-detectable monomers. In CKD patients, the monomeric form is elevated. Intact PINP (iPINP) assay measures the trimeric, Total PINP (TPINP) assay measures both trimeric and monomeric forms. We evaluated these two assays in CKD and hemodialyzed (HD) patients.

METHODS: 157 stage 3-5 CKD patients were analyzed with the IDS-iSYS iPINP and Roche Elecsys TPINP assays; results were evaluated according to our laboratory established reference intervals and eGFR. 125 HD patient samples were also measured; results were compared with b-ALP values. The samples from 22 patients of before and after a single HD session were compared.

RESULTS: In CKD subjects, observed ranges for Total and intact PNP were 8–822 and 8–146ng/mL. 96% (151/157) were within iPINP reference intervals (11–111ng/mL); 63% (99/157) were within TPINP range (15–90ng/mL). Relation between TPINP and eGFR tended to be exponential in patients with GFR<30mL/min whereas it remained linear with iPINP. In HD patients, values for TPINP and iPNP were 18-2192 and 16-641ng/mL, respectively. Using b-ALP cut-off of 20 µg/L to discriminate the high bone turnover patients, 56%(70/125) of HD samples were found to be below this threshold. Among these patients, 93%(65/70) presented normal iPINP values vs. 31% (22/70) in TPINP. A single hemodialysis session did not remove the monomers from the circulation.

CONCLUSIONS: PINP is a promising marker to evaluate bone formation in CKD patients. It might replace the b-ALP in patients where interferences with the liver form of the enzyme can be expected. We have compared two methods for PINP determination, one of which recognizes monomeric fragments that accumulate in CKD patients, TPINP. We have indirect data indicated that this method should not be used in those patients and the “Intact” method is more suitable.

