Abstract

Primary hyperparathyroidism (PHPT) is a common endocrine disorder and one of the most frequent causes of hypercalcemia. It is characterized by excessive production of parathyroid hormone (PTH) commonly by solitary adenoma, less often by multiple adenomas and occasionally by parathyroid carcinoma. Main symptoms include nephrolithiasis, cholecystolithiasis, metabolic bone disease, pancreatitis, peptic ulcer disease and depression. However, clinical features might be ambiguous and imaging tests are sometimes inconclusive. Parathyroid surgery is the only definitive therapy. Fibroblast Growth Factor 23 (FGF-23) is a circulating peptide synthesized by osteocytes and osteoblasts. In renal tubular cells, FGF-23 binds to the FGF receptor (FGFR) and its coreceptor, Klotho protein, which leads to reduced renal phosphate reabsorption and enhanced phosphate urinary excretion. Furthermore, FGF-23 decreases calcitriol synthesis by inhibiting renal 1-α-hydroxylase and stimulating 24-hydroxylase. Osteocalcin, a noncollagenous protein is regarded as a marker of bone formation and N-terminal telopeptide of type I collagen (NTX) is a bone resorption one. Sclerostin, produced by osteocytes, is considered to be a potent inhibitor of osteoblastogenesis and bone formation. The aim of the study was to analyze plasma or serum concentrations of FGF-23, Klotho, osteocalcin, NTX and sclerostin and to establish their clinical utility as indicators of PHPT severity and surgical treatment efficacy. Seventeen patients with hypercalcemia, increased serum PTH levels and normal renal function were enrolled in the study. Inclusion criteria after parathyroidectomy were as follows: normalization of PTH and calcium concentrations and histopathologically confirmed diagnosis. The control group consisted of 9 healthy volunteers, matched with sex and age. In PHPT patients we observed increased levels of FGF-23, osteocalcin, NTX and decreased serum sclerostin concentrations compared to the control group. After parathyroidectomy normalization in osteocalcin, NTX and sclerostin levels was noticed. FGF-23 concentrations declined significantly, but still remained higher in comparison with healthy individuals. No differences in Klotho serum levels between PHPT patients and control group was shown. In conclusion, osteocalcin and NTX might be the potential markers of disease severity in PHPT patients. Moreover, osteocalcin, NTX and sclerostin may be useful in monitoring treatment efficacy. Clinical utility of FGF-23 in patients with primary hyperparathyroidism needs further investigation and long-term observation. Our data did not confirm clinical capability of measuring Klotho serum levels in PHPT.