RELATIONSHIP BETWEEN PLASMA LEVELS OF SCLEROSTIN AND MARKERS OF BONE TURNOVER IN HAEMODIALYSIS PATIENTS WITH CKD

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Category: M6 - Dialysis. Bone disease

Introduction and objectives: Sclerostin in physiological conditions prevents excessive bone formation. Increased plasma sclerostin concentration was found in patients with chronic kidney disease (CKD). However, the effect of sclerostin accumulation in CKD patients on bone turnover was not intensively assessed. Therefore, the aim of this study was to analyse the relationship between plasma levels of sclerostin, calcium-phosphate disturbances, and established markers of bone turnover in haemodialysis patients with CKD.

Methods: One-hundred-fifty adult HD patients (92 males) was enrolled into this study. In addition to routine laboratory parameters (iPTH, Ca, P) plasma levels of sclerostin, 25-OH-D, osteocalcin, N-terminal propeptide of type I procollagen (P1NP), C-terminal telopeptide of the alpha chain of type I collagen (CTx), TNFα, IL-6, and alkaline phosphatase (ALP) activity were also measured.

Results: Mean plasma sclerostin level was 1.88 (95%CI: 1.23 – 3.01) ng/mL. A positive correlation was found between plasma sclerostin concentration and serum phosphate concentration ($\tau = 0.102$; $p = 0.05$), 25-OH-D ($\tau = 0.204$; $p < 0.001$) and TNFα ($\tau = 0.183$; $p < 0.001$), while negative correlation with iPTH ($\tau = -0.255$; $p < 0.001$), CTx ($\tau = -0.099$; $p = 0.05$), ALP ($\tau = -0.203$; $p < 0.001$) and IL-6 ($\tau = -0.201$; $p < 0.001$) and kT/V ($\tau = -0.101$; $p = 0.07$). In multivariate regression analysis sclerostin levels variability was explained by sex (β=0.174 for men vs women), 25-OH-D (β=0.186) and phosphorus (β=0.180).

Table 1. Biochemical characteristics and the study parameters [(mean & 95% CI or *median (25 – 75 percentile)]. ^Mean value from last 6 months.

	Haemodialysis patients (n=150)
Calcium (mg/dL)^	5.77 (5.52 – 6.02)
Phosphorous (mmol/L)^	8.57 (8.44 – 8.70)
iPTH (pg/mL)*	156 (93 – 285)
25-OH-D (ng/mL)	12.8 (11.0 – 14.5)
<10 ng/mL (n/%)	83 / 55.3
10-19.9 ng/mL (n/%)	33 / 22.0
20-29.9 ng/mL (n/%)	22 / 14.7
≥ 30 ng/mL (n/%)	12 / 8.0
Sclerostin (ng/mL)*	1.88 (1.23 – 3.01)
Osteocalcin (ng/mL)*	133 (72 – 223)
P1NP (ng/mL)*	191 (101 – 381)
CTX (ng/mL)*	1.36 (0.87 – 2.14)
hs-CRP (mg/L)*	4.82 (2.33 – 11.60)
Interleukin-6 (pg/mL)*	6.20 (1.01 – 10.32)
TNF-α (pg/mL)*	5.94 (2.93 – 11.80)
Haptoglobin (µg/mL)*	1.37 (0.82 – 2.03)
ALP (U/L)^	115 (98-131)

Figure 1. The correlation between sclerostin and phosphate, 25-OH-D and TNF-α concentrations.

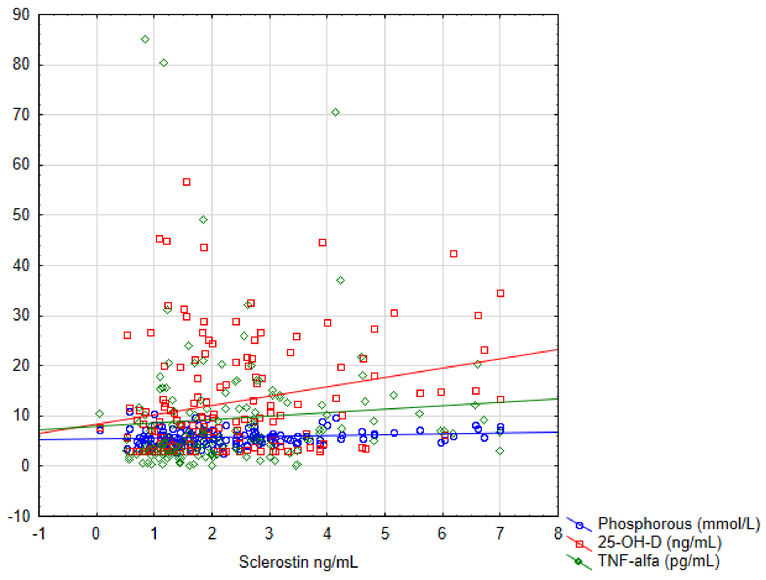
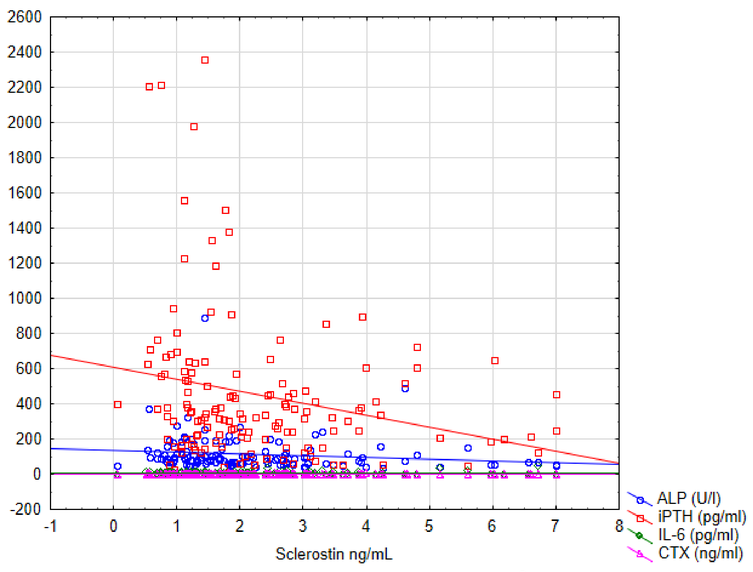


Figure 2. The correlation between sclerostin and ALP, iPTH, IL-6 and CTX concentrations.



Conclusion: 1. Sclerostin secretion in hemodialysis patients seem to be stimulated by vitamin D and phosphorous. 2. Increased level of plasma sclerostin in these patients may suppress bone resorption and decrease bone turnover.

DOI: 10.3252/pso.eu.54ERA.2017