

ASSESSMENT THE RELATIONSHIP BETWEEN SERRUM SOLUBLE KLOTHO AND CAROTID INTIMA-MEDIA THICKNESS AND LEFT VENTRICULAR DYSFUNCTION IN HEMODIALYSIS PATIENTS



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Background

- Fibroblast growth factor-23 (FGF-23) and its co-receptor soluble klotho (s-klotho) have an important role in calcium-Phosphorus homeostasis
- FGF-23 and s-klotho could be the missing link in the detrimental relationship between chronic kidney disease and cardiovascular diseases (CVD).

The aim of our study

- The aim of this study was to assess the relationship between s-klotho and carotid intima-media thickness (CIMT) and left ventricular dysfunction in hemodialysis (HD) patients.

Methods

- This is a cross-sectional study conducted on 88 patients with end-stage renal disease on regular HD and mean age of studied patients was 58.6±19.3 years.
- Fifty one (57.95%) of patients were males and 37 (42.05%) were females.
- Serum levels of calcium (Ca), phosphorus (Ps), parathyroid hormone (PTH) and C-reactive protein (C-RP) were measured.
- The serum levels of s-klotho and FGF-23 were measured using ELISA kit.
- Echocardiography and measurement of CIMT were also conducted.
- The studied patients were divided according to median s-klotho level into two groups, patients with low s-klotho (group I) and patients with high s-klotho (group II)

Results

- Mean value of s-klotho was significantly low in HD patients compared with control (p = 0.0001) [table 1].
- Mean value of FGF-23 was significantly high in HD patients compared with control (p = 0.0001) [table 1].
- Mean values of CIMT, left ventricular mass (LVM), LVM index (LVMI) and LV ejection fraction (LVEF) were high in group I compared with group II [table 2].
- Patients with low s-klotho had significantly more coronary artery disease (CAD).
- There was negative significant correlation between s-klotho and FGF-23 [fig.1].
- There was positive significant correlation between soluble klotho and LVEF [fig.2].
- Regression analysis of s-klotho with different markers of cardiovascular diseases, s-klotho showed significant association with CIMT, LVEF and CAD, but not with LVM and LVMI

Conclusion

- The present study showed that, patients with a low s-klotho associated with increased CIMT, LV dysfunction and CAD more often
- It seems that, there was independent association between s-klotho and CIMT, LVEF and CAD.

Table 1: Laboratory parameters of the studied patients and control group

Variables	All patients(n=88)	Control group(n=28)	P value	Group I(s-klotho<476pg/ml,n=44)	Group II(s-klotho>476pg/ml,n=44)	P value
S.creatinine (mg/dl)	7.9±1.8	0.82±0.3	0.0001	7.5±1.2	8.3±3.1	0.1141
S.Ca (mg/dl)	8.4±1.0	8.5±0.6	0.6178	8.12±0.8	8.7±1.3	0.0136
S.Ps (mg/dl)	3.9±1.1	1.93±0.2	0.0001	4.1±0.5	3.8±0.6	0.0126
S.PTH (pg/ml)	111.7±25.1	31.23±23.4	0.0001	116.9±21.3	97.1±24.5	0.0484
S-klotho (pg/ml)	477.9±76.2	863.7±261.8	0.0001	427.8±46.2	535.4±61.4	0.0001
S.FGF-23 (pg/ml)	60.5±17.6	35.8±13.9	0.0001	67.8±24.2	50.3±11.2	0.0001

S.PTH, serum parathyroid hormone; S.Ca, serum calcium; S.Ps, serum phosphorus; s-klotho, soluble klotho; S.FGF-23, serum fibroblast growth factor-23

Table 2: Echocardiographic findings ,CIMT and CAD of the studied patients and control group

Variable	All patients(n=88)	Control group(n=28)	P value	Group I(s-klotho<474,n=44)	Group II(s-klotho>474,n=44)	P value
LVM (g)	193.4±22.3	112.7±23.6	0.0001	198.6±26.3	188.2±18.3	0.0341
LVMI (g/m ²)	110.4±21.5	66.4±21.3	0.0001	120.7±23.2	110.2±18.6	0.0215
LVEF (%)	49.6±10.2	58.6±6.3	0.0001	45.9±10.3	55.2±9.3	0.0001
CIMT (mm)	0.99±0.19	0.78±0.23	0.0001	1.17±0.23	0.93±0.13	0.0001
CAD	58 (65.9%)	-		36 (81.1%)	22 (50.0%)	0.0044

LVM, left ventricular mass; LVMI, left ventricular mass index; LVEF, left ventricular ejection fraction; CIMT, carotid intima-media thickness; CAD, coronary artery disease

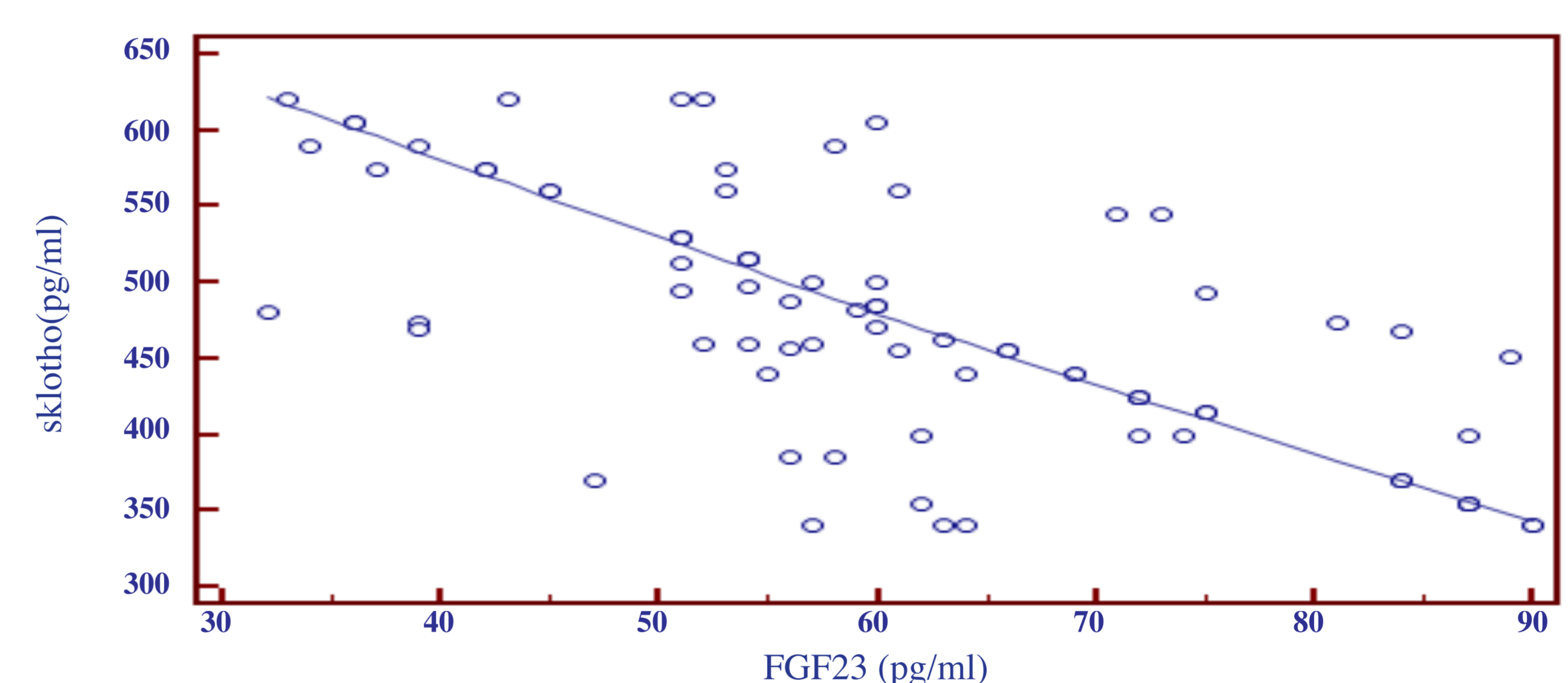


Fig.1:Correlation coefficient between s-klotho and FGF-23 (r=-0.717, 95% CI -0.806 to-0.598, p=0.0001)

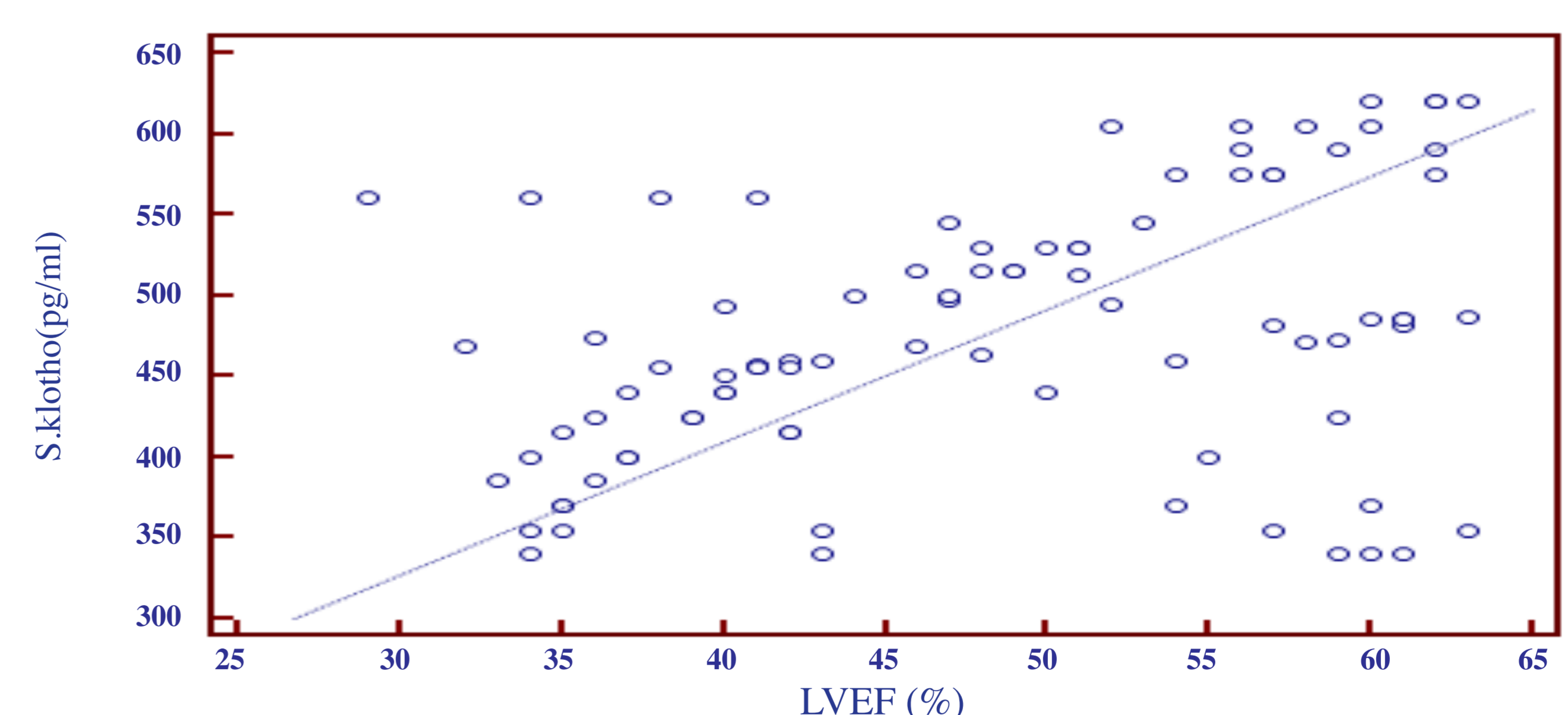


Fig.2: Correlation coefficient between s-klotho and LVEF (r= 0.392, 95% CI 0.199 to-0.556, p=0.0002)

