IMPACT OF HYPERPHOSPHATEMIA CORRECTING THERAPY ON CARDIOVASCULAR RISK MARKER – FGF-23 IN CHRONIC KIDNEY DISEASE PATIENTS.

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OBJECTIVES:. The aim of the study was to evaluate the impact of phosphate binders on the cardiovascular risk marker - FGF-23 serum levels in CKD stages 4-5D nondiabetic patients.

METHODS:The main group consisted of 61 CKD stage 4-5D patients who had at screening increased phosphorus levels in serum (>1,6mmol/l).Besides standard clinical examination, all patients were measured levels of parathyroid hormone (PTH), total serum calcium, phosphorus. ELISA was used for serum FGF-23 study (Human FGF-23 ELISA kit with using antibodies to full FGF-23 molecule). Blood pressure (BP) including brachial and central (aortic) pressure were measured to all the patients with a Sphygmokor device (Australia). ECG, EchoCG, X-ray of the abdominal aorta in lateral projection (Kauppila method) were performed. All patients were observed in dynamic within 1 year.

RESULTS: To all cohort patients phosphate binders (PB) have been appointed. Group 1 (n=29) was used not calcium-containing PB (sevelamer hydrochloride up to 2400 mg /day) and Group 2 (n=32) was started to treat with calcium carbonate (up to 1.5 g /day). At the end of the observation the patients, who managed to achieve and maintain a target level of inorganic phosphorus in serum, marked lower rates of FGF-23 and PTH. In addition, the target level of phosphorus and a more pronounced reduction of FGF-23 and PTH in serum were achieved predominantly in those patients, who used to correct the hyperphosphatemia not calcium-containing phosphate binders (sevelamer hydrochloride) [p<0,05] (25 vs 14) Fig.1.

Moreover, in Group 2 were more frequent episodes of hypercalcemia (0 vs 4) and a greater degree of calcification of the heart and vessels (p <0.01) according to EchoCG (assessed by semiquantitative scale) and X-ray of the abdominal aorta (Method Kauppila). Also, the frequency of arterial hypertension, including central (aortic) pressure and the increasing of left ventricular hypertrophy and myocardial mass index degree were higher in Group 2 (p<0,01)

We assessed the effect of hyperphosphatemia correction (diet + phosphate binders) in patients 4-5D CKD stages on cardiovascular risk during the 1st year of dialysis therapy. It has been shown that patients with early correction of hyperphosphatemia (at predialysis stages) predominantly with not calcium-containing PB had a lower FGF-23 serum levels and lower risk of cardiovascular complications during the 1st year of hemodialysis treatment [RR=1,1, 95% CI 1,08-1,54]. *(Fig.2).*

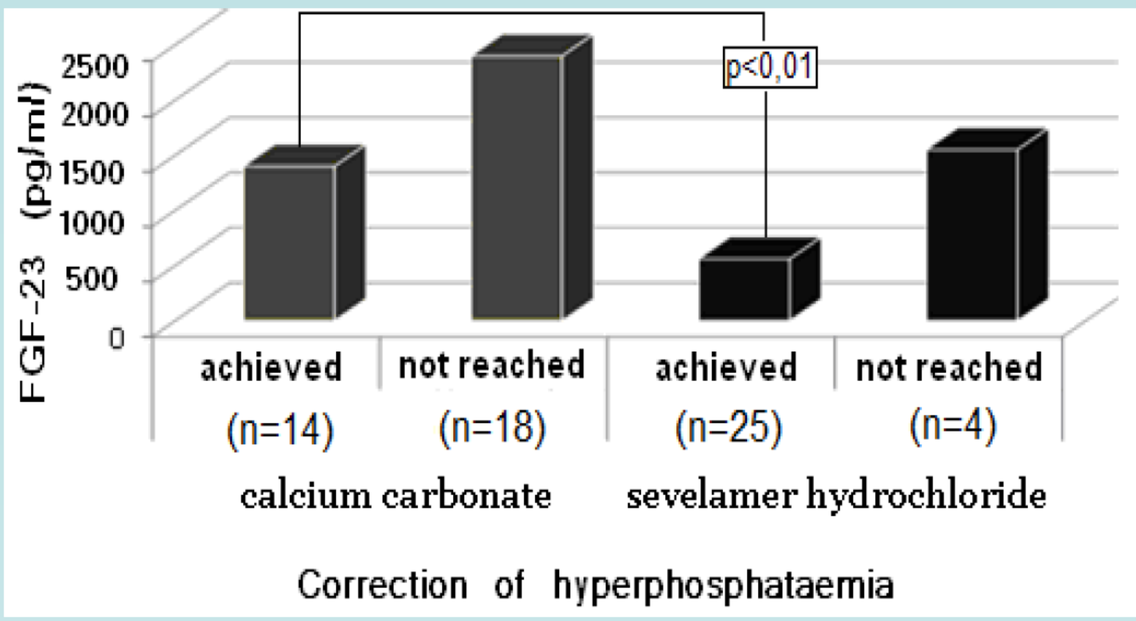

Fig.1

index	**Early** correction of hyperphosphatemia (CKD 4-5st.)		**Later** correction of hyperphoshatemia (dialysis)	
	predialysis	**FGF-23,pg/ml**	**simultaneously with the hemodialysis start**	**FGF-23,pg/ml**
The worsening of angina functional class, %	4,9**	780,0±145,3**	28,5	1710,4±301,5
LVH concentric type, %	28,5**	767,5±133,6**	57,1	1955,0±342,8
Cardiac arrhythmias, %	5,7**	1000,2±242,1**	42,8	2082,5±423,4

Tab.1

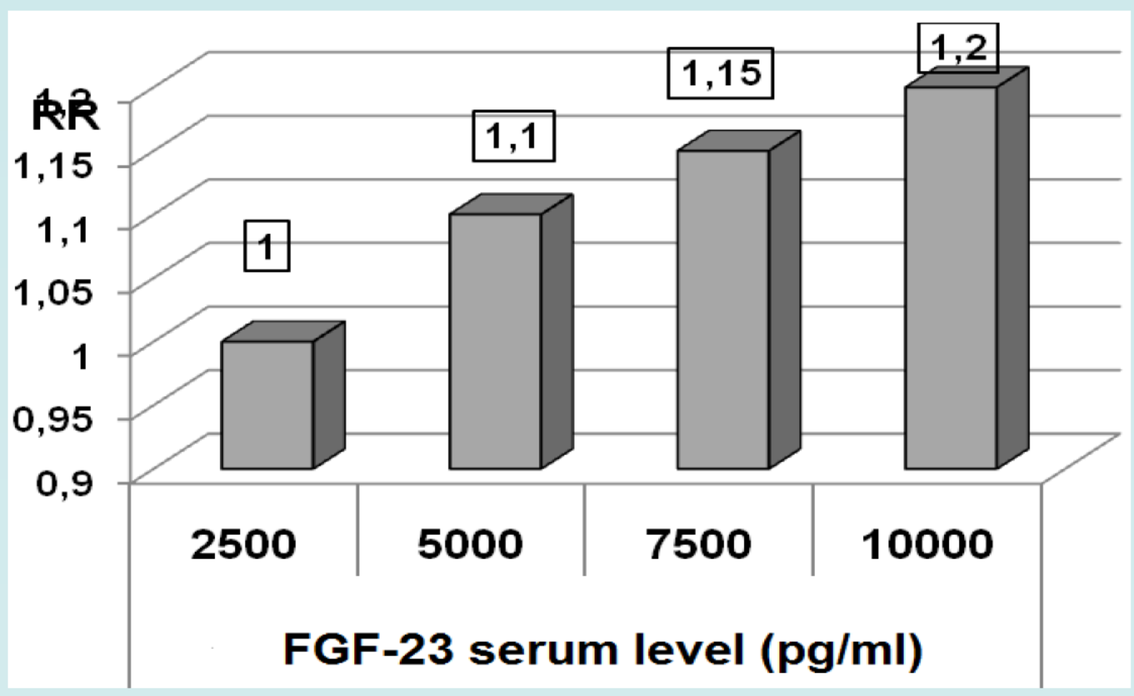

Fig.2

CONCLUSION:In patients with CKD, who managed to achieve and maintain a target level of inorganic phosphorus in serum, marked lower rates of serum FGF-23 and PTH. Use of binders not containing calcium associated with higher frequency achieve target values of phosphorus and PTH levels in serum, lower FGF-23 levels, lower cardiovascular complications than the use of calcium carbonate
The study showed the possibility of FGF-23 practical use as an early diagnostic markers of cardiovascular risk and that adequate correction of their changes including of hyperphosphatemia correcting therapy started in predialysis CKD can reduce the risk of cardiovascular complications and increase the survival of CKD patients in general

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