THE ASSOCIATION OF KDIGO SUGGESTIONS FOR MINERAL AND BONE DISORDER MARKERS ACHIEVEMENT AND PRESENCE OF THE CARDIAC VALVE CALCIFICATION IN OUR HEMODIALYSIS PATIENTS

Gelev Saso[1], Trajceska Lada[1], Srbinovska Elizabeta[2], Pavleska Svetlana[1], Selim Gjulsen[1], Dzekova Pavlina[1], Sikole Aleksandar[1]

University Clinic of Nephrology[1]
University Clinic of Cardiology[2]
Skopje, R. Macedonia

INTRODUCTION

Numerous epidemiologic studies have demonstrated that an increases in serum phosphorus (P) and calcium (Ca), as well as abnormalities in serum parathyroid hormone (PTH) levels are associated with significant increased morbidity and mortality in HD patients (1).

Based on these findings and supplemented by an expert opinion, the Kidney Disease: Improving Global Outcomes (KDIGO) Chronic Kidney Disease – Mineral and Bone Disorder (CKD–MBD) Work Group, published clinical practice guidelines in 2009.

The KDIGO guidelines for the Diagnosis, Evaluation, Prevention, and Treatment of CKD-MBD provided recommended target ranges for serum MBD markers, such as intact PTH, serum Ca and serum P (2).

The present clinical practice guidelines were developed to provide an integrated clinical action plan to decrease morbidity (symptoms) and mortality in HD patients.

Valvular calcification is common in HD patients (3).

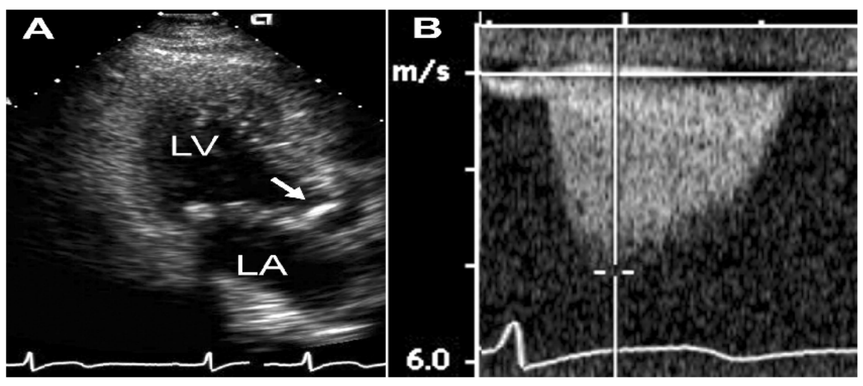
Calcific valvular heart disease contributes to the strikingly high incidence of valvular dysfunction (4), left ventricular hypertrophy & dysfunction (5), atrial and ventricular arrhythmias and death (6) in those patients.

AIM

The aim of this study was to evaluate the association between the attainment of KDIGO suggestions for MBD markers levels and the cardiac valve calcification presence in our HD patients.

MATERIALS & METHODS

Baseline echocardiography was performed in 112 prevalent HD patients (68 male; mean age 54.8 17.3 years; mean duration of HD 97.4 58.8 months) to screen for calcification of the cardiac valves.



Echocardiograms were graded as 0-2 for absence or presence of calcification of the mitral and aortic valve. The patients ware stratified according to the number of calcified valves in three groups: group I, those without valvular calcification; group II, those with one calcified valve (either mitral or aortic); group III, those with calcification on both valves (mitral and aortic).

The serum levels and the proportion of the KDIGO guideline achieved ranges for MBD markers of the last 12 months records between the groups of patients were compared.

In total 1244 data for serum Ca, 1252 data for serum P and 196 data for serum intact PTH were analyzed.

RESULTS

Table 1 : Risk factors that may influence cardiac valve calcification development :

Groups of the patients…	with one calcified valve (n=47) 41.9 %	without calcified valves (n=34) 30.4 %	with calcification on both valves (n=31) 27.7 %	p value
age (years)	54.3±17.5	53.8±19.7	55.6±18.4	ns
gender (male / female)	27 / 20	21 / 13	20 / 11	ns
arterial hypertension (yes / no)	11 / 36	7/ 27	8 / 23	ns
diabetic patients (yes / no)	8 / 39	5/ 29	6 / 25	ns
dyslipidemia (yes / no)	7 / 40	5/ 29	5 / 26	ns
BMI (kg/m^2)	22.1 ± 3.8	22.4 ± 3.6	21.7 ± 4.1	ns
smoking (yes / no)	5 / 42	3/ 31	4 / 27	ns
serum CRP (mg/L)	5.8 ± 9.4	5.4±7.6	5.9±8.7	ns
total serum Ca (mmol/L)	2.35±0.17	2.31±0.14	2.37±0.18	ns
serum P (mmol/L)	1.49±0.37	1.45±0.35	1.52±0.36	ns
serum iPTH (pg/mL)	221.3±182.8	214.6±167.5	236.4±244.8	ns
s. Ca in KDIGO proposed range (%)	157 / 524 (29.9) [1]	193 / 372 (55.2)	93 / 348 (26.7) [2]	0.002
s. P in KDIGO proposed range (%)	168 / 526 (31.9) [3]	197 / 376 (52.4)	99 / 350 (28.3) [4]	0.008
s. iPTH in KDIGO proposed range (%)	26 / 83 (31.3) [5]	34 / 58 (58.6)	15 / 55 (27.3) [6]	0.000

Group with one calcified valve vs group without calcified valves: [1] p<0.005, [3] p<0.01, [5] p<0.001
Group with both calcified valves vs group without calcified valves: [2] p<0.005, [4] p<0.01, [6] p<0.001

The patients without valvular calcification had significantly higher percentages of attained KDIGO recommended levels for serum Ca, serum P and serum iPTH in comparison with the other two groups of patients (table 1).

Multivariate adjusted logistic regression analyses identified serum P in KDIGO proposed range as a factor independently and significantly associated with the cardiac valve calcification occurrence in our HD patients (table 2).

Table 2: Multivariate adjusted logistic regression report of parameter significance with the group of the patients without valvular calcification as the reference value :

parameter	group	Wald Z-value	p- value	OR (95% CI)
serum P in KDIGO proposed range (no-0, yes-1)	with one calcified valve	1.211	0.007	1.24 (1.06 – 1.44)
	with two calcified valves	2.082	0.002	1.065 (1.20 – 2.26)

CONCLUSIONS

The proportions of MBD markers achievement within the KDIGO guidelines might be a superior indicator than serum levels of MBD parameters in the evaluation of cardiac valve calcification pathogenesis in HD patients.

In HD population, a greater prevention of cardiac valve calcification development could be managed if a higher proportion of the suggested levels for the serum MBD, especially P, are achieved

REFERENCES
1. Block GA, Klassen PS, Lazarus JM, Ofsthun N, Lowrie EG, Chertow GM. Mineral metabolism, mortality, and morbidity in maintenance hemodialysis. J Am Soc Nephrol 2004; 15: 2208-2218.
2. Kidney international: KDIGO Clinical Practice Guideline for the Diagnosis, Evaluation, Prevention, and Treatment of Chronic Kidney Disease-Mineral and Bone Disorder (CKD-MBD); Vol. 76, Supp. 113, August 2009.
3. Paolo Raggi, et al. Valvular Calcification in Hemodialysis Patients Randomized to Calcium-Based Phosphorus Binders or Sevelamer. J Heart Valve Dis Vol. 13. No. 1 January 2004.
4. Huting J. Mitral valve calcification as an index of left ventricular dysfunction in patients with endstage renal disease on peritoneal dialysis. Chest 1994;105:383-38
5. Ventura JE, et al. Aortic valve calcification is an independent factor of left ventricular hypertrophy in patients on maintenance haemodialysis. Nephrol Dial Transplant 2002;17:1795-1801.
6. Wang M, et al. Peak early diastolic mitral annulus velocity by tissue Doppler imaging adds independent and incremental prognostic value. J Am Coll Cardiol 2003;41:820-82

DOI: 10.3252/pso.eu.51era.2014
Poster presented at: