CARDIAC VALVE CALCIFICATION PRESENCE IN OUR HEMODIALYSIS PATIENTS WITH DIFFERENT DAILY PRESCRIPTION OF CALCIUM CARBONATE

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INTRODUCTION

- Calcium (Ca) deposition in the soft tissues of hemodialysis (HD) patients is common (1).
- There are an abundance of observational studies in HD patients that show an association between elevations in serum Ca with overall and cardiovascular mortality (2).

- The use of high doses of Ca-based phosphate binder was associated with higher incidence of hyper-calcaemia and may aggravate vascular calcification (3).
- The avoidance of marked or prolonged positive Ca balance is crucial (1).

Valvular calcification is common in HD patients (4).

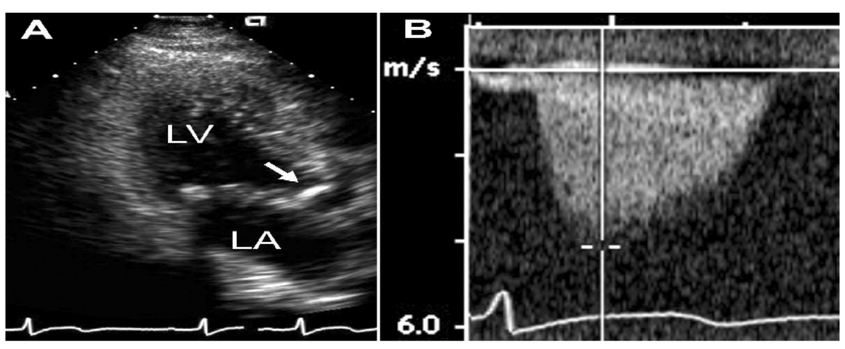
Calcific valvular heart disease contributes to the strikingly high incidence of valvular dysfunction (5), left ventricular hypertrophy & dysfunction (6), atrial and ventricular arrhythmias and death (7) in those patients.

AIM

The aim of this study was to evaluate whether different daily doses of prescribed calcium carbonate ($CaCO_3$) may have an impact on cardiac valve calcification presence in our HD patients.

MATERIALS & METHODS

Baseline echocardiography was performed in 108 prevalent HD patients (66 male; mean age 54.6 16.7 years; mean duration of HD 98.7 64.6 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).

We analyzed the doses of prescribed $CaCO_3$ (used as a unique phosphate binder in our HD population) taken as an average of the last 24 months evaluation.

RESULTS

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

Groups of the patients…	with one calcified valve (n=44) 40.8 %	without calcified valves (n=36) 33.3 %	with calcification on both valves (n=28) 25.9 %	p value
age (years)	54.7±18.4	52.9±16.9	55.3±17.6	ns
gender (male / female)	27 / 17	20 / 16	19 / 9	ns
arterial hypertension (yes / no)	10 / 34	7/ 29	7/ 21	ns
diabetic patients (yes / no)	8 / 36	6/ 30	6 / 22	ns
dyslipidemia (yes / no)	7 / 37	5/ 31	5 / 23	ns
BMI (kg/m^2)	22.4 ± 3.6	22.6 ± 3.3	21.9 ± 3.5	ns
smoking (yes / no)	5 / 39	3/ 33	3 / 25	ns
serum CRP (mg/L)	5.9 ± 6.4	5.4±9.6	5.9±10.7	ns
total serum Ca (mmol/L)	2.36±0.18	2.32±0.17	2.38±0.19	ns
serum P (mmol/L)	1.48±0.33	1.45±0.31	1.51±0.35	ns
serum iPTH (pg/mL)	219.6±173.7	208.6±184.4	233.5±236.6	ns
daily doses of prescribed $CaCO_3$ (g)	2.33±0.59 [1]	1.37±0.62	2.65±0.72 [2]	0.002

Group with one calcified valve vs group without calcified valves: [1] $p<0.005$
Group with both calcified valves vs group without calcified valves: [2] $p<0.001$

The patients without valvular calcification had significantly lower daily doses of prescribed $CaCO_3$ in comparison with the groups of patients having one and patients with both calcified valves (table 1).

There were no significantly differences in the prescribed daily doses of $CaCO_3$ between the groups of patients having one and patients with both calcified valves (table 1).

Multivariate adjusted logistic regression analyses (with group of the patients without valvular calcification as the reference value) identified daily doses of prescribed $CaCO_3$ 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-valu5e	OR (95% CI)
daily doses of prescribed $CaCO_3$ (g)	with one calcified valve	1.223	0.02	1.04 (1.008 – 1.077
daily doses of prescribed $CaCO_3$ (g)	with both calcified valves	1.395	0.009	1.2 (1.054 – 1.446)

CONCLUSIONS

This research showed significantly reduced cardiac valve calcification presence in our HD patients with lower daily prescription of $CaCO_3$.

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