EFFECT OF LANTHANUM CARBONATE ON CORONARY ARTERY CALCIFICATION DURING THE EARLY PERIOD AFTER INITIATION OF HEMODIALYSIS

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Background/Aims

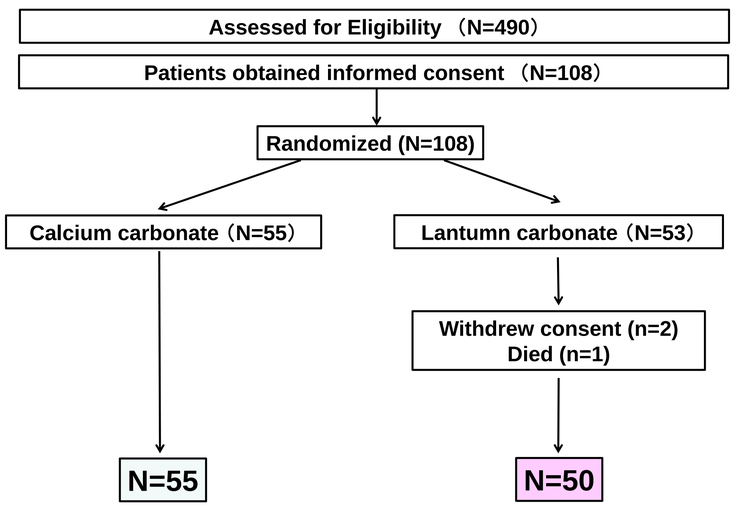
Vascular calcification (VC) is frequently observed in patients with chronic kidney disease (CKD). Numerous reports showed that VC is an important risk factor for cardiovascular disease (CVD) events and mortality. It has been also known that calcium-based phosphate binder is more closely associated with the progression of VC compared to non-calcium-based phosphate binder.

Lanthanum carbonate (LC) is one of the non-calcium-based phosphate binders that decreases serum phosphate levels in patients with CKD. Though several studies have reported that LC has less effect on the progression of VC compared to calcium-based phosphate binder in patients with maintenance hemodialysis, there is no report investigated its effect on the progression of VC in CKD patients during the early period after initiation of hemodialysis (HD).

In the present study, we investigated the effect of LC on the progression of coronary artery calcification (CAC) in these patients compered to calcium-based phosphate binder.

Methods

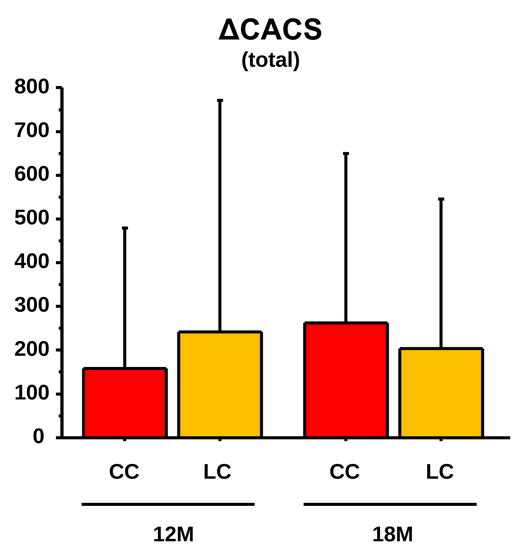
This was a randomized open-label study including 108 patients from five centres. These patients were registered with the present study just prior to or within 4 weeks after initiating HD therapy. They were divided into two groups based on the treatment of hyperphosphatemia; the calcium carbonate (CC group) and the LC (LC group). Serum calcium, phosphate, PTH and FGF23 levels and cardiovascular biomarkers were measured prior to initiating HD and 6, 12 and 18 months after initiating HD. We also evaluated CAC by high-resolution computed tomography and the echocardiographic parameters prior to initiating HD and 12 and 18 months after initiating HD.

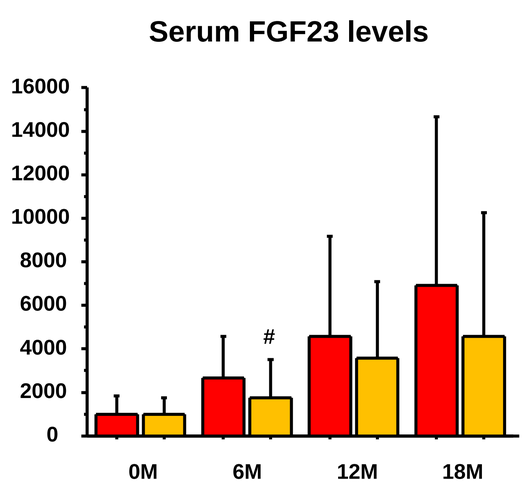


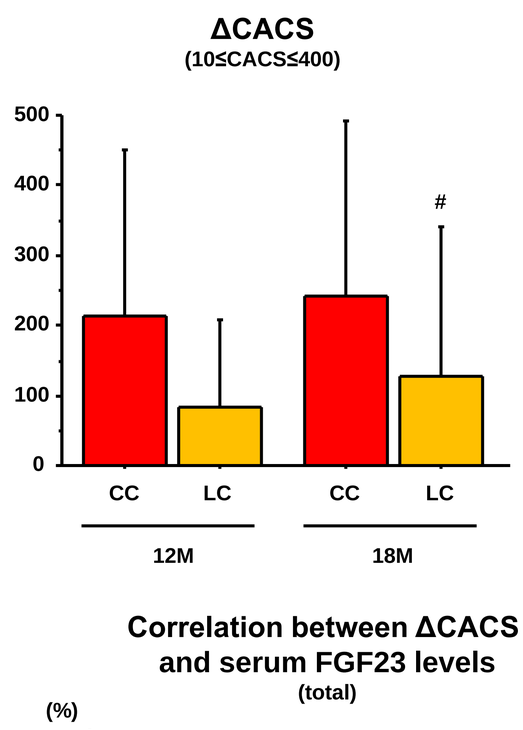
【Clinical characteristics at baseline】

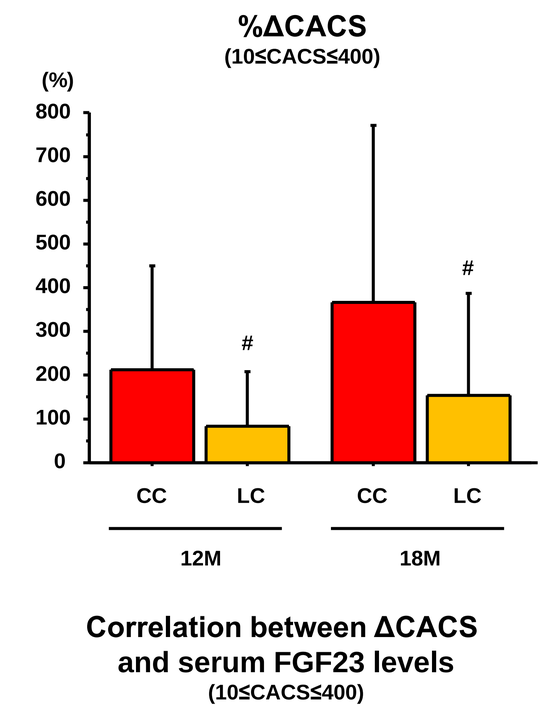
	CC (n=55)	LC (n=50)	*p*
Male gender (%)	38 (69.1)	44 (88.0)	0.0191
Age (year)	63±13	65±14	0.3826
BMI	24.3±3.9	24.5±4.0	0.7259
SBP (mmHg)	149.2±22.8	146.7±19.9	0.5630
DBP (mmHg)	75.0±14.1	71.8±14.9	0.2687
Smoking (%)	26 (47.3)	19 (38.0)	0.3423
HT (%)	53 (96.4)	48 (96.0)	0.9235
DM (%)	23 (41.8)	26 (52.0)	0.3008
HLP (%)	18 (32.7)	18 (36.0)	0.7273
CVD (%)	16 (29.1)	10 (20.0)	0.2855
ACE-I/ARB (%)	34 (61.8)	30 (60.0)	0.8505
Statin (%)	24 (43.6)	14 (28.0)	0.0977
Vit. D (%)	22 (40.0)	17 (34.0)	0.5297
Warfarin (%)	0 (0)	4 (8.0)	0.5297
Hb (g/dl)	8.6±1.6	8.8±1.4	0.4462
Cr (mg/dl)	9.1±2.3	8.8±2.4	0.4855
eGFR (ml/min/1.73m^2)	5.2±1.3	5.8±2.3	0.0669
Alb（g/dl）	3.3±0.6	3.4±0.5	0.3724
cCa (mg/dl)	8.3±0.9	8.5±0.7	0.2129
P (mg/dl)	5.9±1.5	5.7±1.5	0.3484
iPTH (pg/ml)	349.5±231.3	333.0±275.7	0.7413

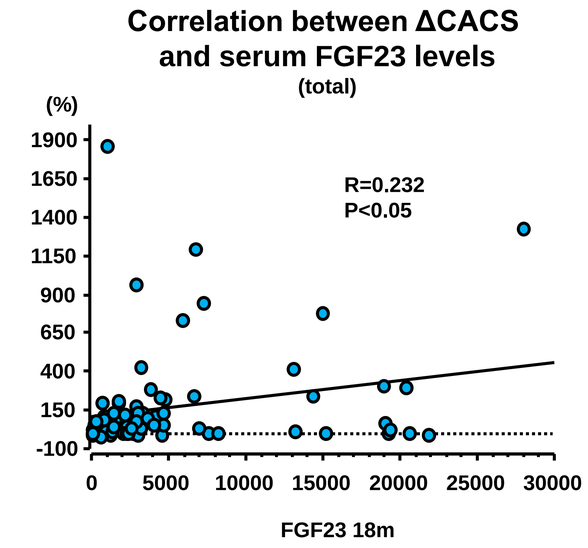
Results

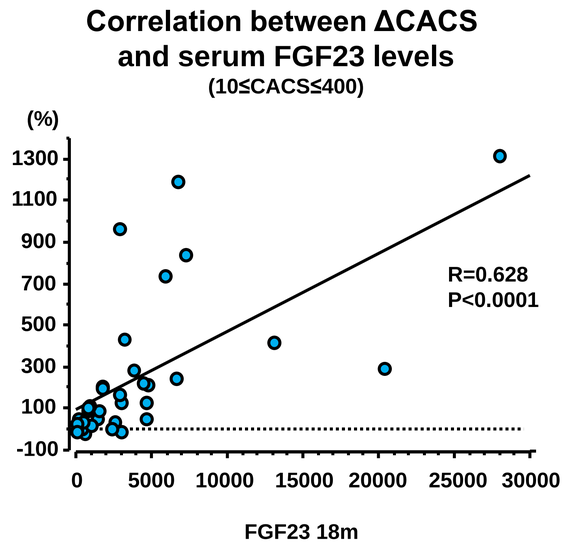












- ✓Though serum phosphate levels were comparable between the two groups at 18 months, serum calcium levels were significantly lower, serum PTH levels tended to be higher and serum FGF23 levels tended to be lower in the LC group compared to the CC group.
- ✓CACS was lower in the LC group compared to the CC group although there was no statistical difference.
- ✓Among the patients with mild or moderate CAC, the change and percent change in CACS between the baseline and 12 months as well as baseline and 18 months were significantly higher in the CC group compared to those in the LC group
- ✓The percent change in CACS between baseline and 18 months was significantly correlated with the serum FGF23 levels at 18 months.
- ✓The significant relationship was stronger, especially among the patients with mild or moderate CAC.

Conclusion

Our study suggest that LC prevents the development of CAC in patients with mild or moderate CAC during the early period following the initiation of HD. LC could suppress the elevation of serum FGF23 levels and thereby delay the progression of CAC.

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