IMPACT OF CHOLECALCIFEROL SUPPLEMENTATION ON LONG-TERM SURVIVAL IN HEMODIALYSIS PATIENTS

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INTRODUCTION

Vitamin D deficiency is a well recognized problem in hemodialysis patients. Studies suggested beneficial effects of vitamin D supplementation in patients on hemodialysis, but less is known about the impact of vitamin D supplementation on long-term outcome in these patients.[1-4] In a previous study we designed a protocol for vitamin D supplementation with 40.000 IU of cholecalciferol once monthly.[5]

The aim of this study was to evaluate the impact of cholecalciferol supplementation on long-term survival in hemodialysis patients who completed intensive two-year cholecalciferol supplementation.

METHODS

57 adult Caucasian patients (31 women, 26 men; mean age 71.2 years) who completed a prospective study with intensive cholecalciferol supplementation for vitamin D deficiency during years 2008-2010, were included. They were followed for 2000 days or until patients' death. In each patient the values of calcium, phosphate, intact parathormone (iPTH), 25-hydroxyvitamin D (25-OH-D), number of received doses of 40.000IU of cholecalciferol and dialysis vintage in period of prospective study were determined.

Statistical analyses were performed using IBM® SPSS® Statistics, version 19.0. Survival rates were analysed using Kaplan-Meier survival curves. Cox regression model was used to assess the influence of cholecalciferol supplementation on long-term outcomes. The model was adjusted for mean values of calcium, phosphate, iPTH, 25-OH-D, number of received doses of 40.000IU of cholecalciferol and dialysis vintage. P-values < 0.05 were considered statistically signficant.

RESULTS

Median value of serum 25-OH-D in supplementation period was 50 nmol/L. In the follow-up period of 5.5 years 37 (64.9%) patients died. Kaplan-Meier survival curve showed higher mortality in patients with serum 25-OH-D level above 50 nmol/L, compared to those with lower levels of 25-OH-D (log rank test: P < 0.022) (Figure). Adjusted Cox regression analysis showed that the mean serum calcium of supplementation period remained the only predictor for mortality with HR for death 6,677 (95% CI 1.172 - 38.037; P = 0.032). There were no statistically significant differences between survivors and non-survivors in mean serum calcium, mean serum phosphate, mean serum iPTH, mean serum 25-OH-D, number of received doses of 40.000IU of cholecalciferol and dialysis vintage (Table) .

	SURVIVORS	NON-SURVIVORS	P-value
Ca (mmol/L)	2.01 ± 0.33	2.16 ± 0.23	NS
P (mmol/L)	1.37 ± 0.32	1.38 ± 0.31	NS
iPTH (pg/mL)	244.0 ± 184.2	269.2 ± 210.6	NS
25-OH-D (nmol/L)	46.37 ± 13.66	50.99 ± 11.80	NS
N° of doses of cholecalciferol	13.5 ± 3.95	12.81 ± 3.85	NS
Dialysis vintage (months)	79.7 ± 74.7	76.3 ± 64.4	NS

Table: comparison of mean valueas of serum calcium (Ca), phosphate (P), intact parathormon (iPTH), 25-hydroxyvitamin D (25-OH-D), recieved doses of cholecalciferol and dialysis vintage betveen survivors and non-survivors

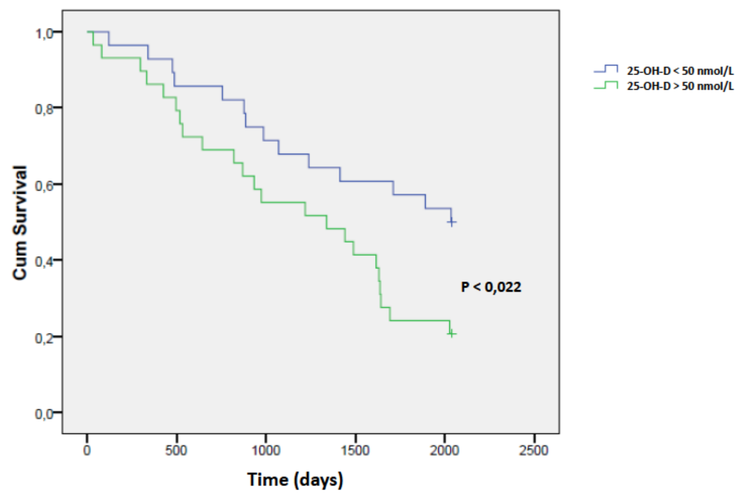

Figure: survival of patients depending on their levels of 25-hydroxyvitamin D (25-OH-D)

CONCLUSIONS

Our results indicate that serum 25-OH-D levels above 50 nmol/L after two-year cholecalciferol supplementation were associated with worse survival outcome in hemodialysis patients in 5.5 years of follow-up and mean serum calcium level being the predictor of mortality. According to our results more careful monitoring of serum calcium level during supplementation of vitamin D is recommended and further studies to evaluate the effects of supplementation are needed.

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