

Mortality Rates Do Not Differ Among Patients on Peritoneal Dialysis Prescribed Different Active Vitamin D Agents

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INTRODUCTION

There is little well-controlled research examining the impact of the different formulations of oral vitamin D on clinical outcomes in dialysis patients. There is clear evidence that some providers have strong preference and nearly exclusive use of one oral vitamin D over another. For this retrospective analysis, we used physician preference as an instrumental variable to reduce or eliminate confounding.

METHODOLOGY

- We examined two years (7/1/2008 to 6/30/2010) of oral medication records of peritoneal dialysis (PD) patients from a large US dialysis organization.
- Patients were identified whose physicians prescribed only one form of vitamin D (calcitriol, paricalcitol, or doxercalciferol) to $\geq 90\%$ of their PD patients.
- We excluded incident patients (treated < 90 days) and patients whose physicians treated < 5 PD patients.

RESULTS

Table 1. Vitamin D Usage: All PD Patients Across the LDO

Vitamin D usage	Patient-months	All months with use of any vitamin D (%)	All months with use of a single vitamin D (%)
Calcitriol only	44945	24.73%	30.35%
Doxercalciferol only	54219	29.83%	36.61%
Paricalcitol only	48949	26.93%	33.05%
Multiple formulations in month	4386	2.41%	-----
No oral vitamin D	29257	16.10%	-----
All patient-months	181756	100.00%	

Table 3. Patient Characteristics by Vitamin D Formulation

Patient Characteristics	Formulation			
	Calcitriol (n=643)	Doxercalciferol (n=516)	Paricalcitol (n=548)	All (N=1707)
<i>Gender</i>				
Male	354 (55.1%)	294 (57.0%)	270 (49.3%)	918 (53.8%)
Female	289 (44.9%)	222 (43.0%)	278 (50.7%)	789 (46.2%)
<i>Race/Ethnicity</i>				
African-American	215 (33.4%)	180 (34.9%)	150 (27.4%)	545 (31.9%)
Caucasian	240 (37.3%)	207 (40.1%)	297 (54.2%)	744 (43.6%)
Hispanic	82 (12.8%)	82 (15.9%)	68 (12.4%)	232 (13.6%)
Asian/Pacific Islander	74 (11.5%)	33 (6.4%)	17 (3.1%)	124 (7.3%)
Native American	2 (0.3%)	1 (0.2%)	1 (0.2%)	4 (0.2%)
Other/Unknown	30 (4.7%)	13 (2.5%)	15 (2.7%)	58 (3.4%)
Mean age (yr)	53.03	54.96	55.14	54.30
Mean vintage (yr)	2.99	2.90	2.49	2.80
Mean BMI	27.14	27.87	28.72	27.88
<i>Cause of ESRD</i>				
Diabetes	200 (31.1%)	176 (34.1%)	198 (36.1%)	574 (33.6%)
Hypertensive KD	148 (23.0%)	182 (35.3%)	137 (25.0%)	467 (27.4%)
Polycystic KD	21 (3.3%)	25 (4.8%)	38 (6.9%)	84 (4.9%)
Other	274 (42.6%)	133 (25.8%)	175 (31.9%)	582 (34.1%)
Mean Charlson Index	4.15	4.29	4.32	4.25

Table 2. Vitamin D Usage: PD Patients of Physicians with 1 Formulation and Mortality Risk*

Physician formulation	Physicians	Patients	Use (%)	Deaths	Overall mortality	Deaths per 100 patient-years	95% CI
Calcitriol	74	643	39.5%	65	10.1%	9.33	7.06, 11.60
Doxercalciferol	53	516	31.4%	70	13.6%	12.20	9.34, 15.06
Paricalcitol	61	548	29.1%	64	11.7%	12.27	9.27, 15.28
Total	188	1707		199	11.7%	11.11	

* limited to physicians prescribing only 1 form of vitamin D to $\geq 90\%$ of their PD patients

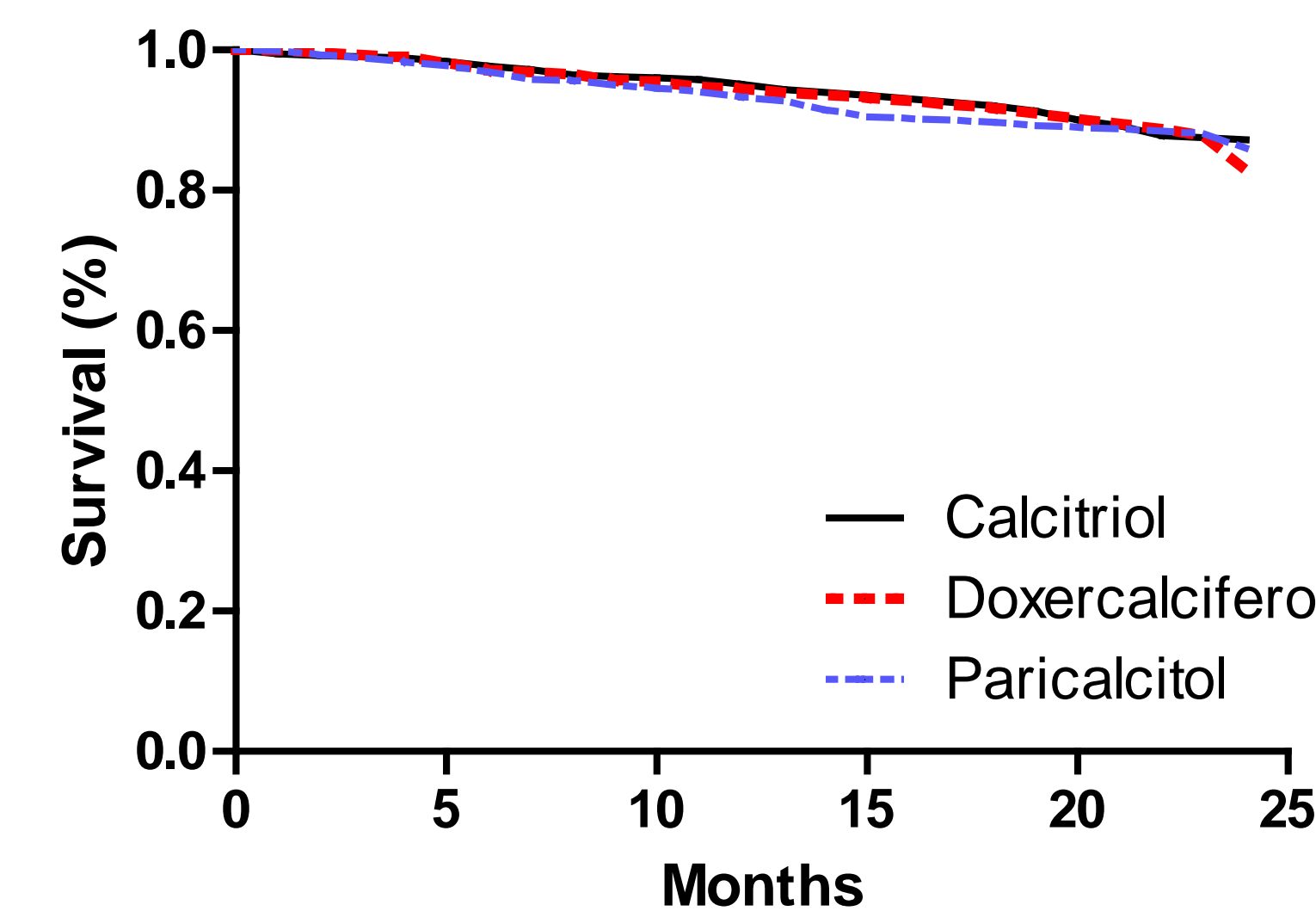


Figure 1. Survival Curve among the 3 Vitamin D Formulations. The survival curve has been adjusted for demographic factors, ESRD cause and comorbid conditions.

Table 4. Adjusted Hazards Ratios and 95% Risk Limit Intervals between Active Vitamin D Formulations

Comparison	Adjusted HR	95% Risk Limit Interval
Doxercalciferol vs. calcitriol	1.186	(0.795, 1.768)
Paricalcitol vs. calcitriol	1.213	(0.818, 1.797)
Paricalcitol vs. doxercalciferol	1.023	(0.696, 1.502)

SUMMARY of RESULTS

- Calcitriol is used in 30.35% of all patient-months with 1 vitamin D formulation (Table 1) but the patient-time observed among physicians identified to prescribe calcitriol is 39.5% (Table 2).
- Patients with physicians in the calcitriol group had a lower mortality rate (9.33 deaths per 100 patient-years) than patients in the other 2 groups (Table 2), however, results did not reach statistical significance.
- Patients in the calcitriol group had a mean age approximately 2 years lower than the other vitamin D groups (Table 3) and a lower prevalence of any cardiac or vascular disease: 9.3% calcitriol versus 12.6% and 15.0% for doxercalciferol and paricalcitol respectively.
- A Cox proportional hazards model, adjusting for differences in age, vintage, gender, race, BMI, and comorbidities showed no significant differences among the formulations (Figure 1 and Table 4).

KEY LEARNINGS

- ✓ Among PD patients, instrumental variables analyses showed no differences in mortality among patients receiving any of the 3 currently available oral vitamin D formulations.

Our sincere appreciation to the teammates in nearly 1600 DaVita clinics who work every day not only to take care of patients but also to ensure the extensive data collection on which our work is based. We thank DaVita Clinical Research® (DCR), and specifically acknowledge Karen Spach, PhD of DCR for her editorial contribution, in preparing this poster. DCR is committed to advancing the knowledge and practice of kidney care.

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ISN World Nephrology Conference, April 8-12, 2011, Vancouver, British Columbia