A Phase 2A Pharmacokinetic Study of an Oral Vitamin D Compound (2MD) in Patients with Secondary Hyperparathyroidism

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Abstract

Secondary hyperparathyroidism (SHPT) is a common complication of progressive chronic kidney disease. The rise in PTH level is multifactorial and includes a variety of factors including phosphate overload, aluminum toxicity, and/or dose escalation of calcitriol. Vitamin D analogs such as paricalcitol and cinacalcet, which is highly effective for the bone and parathyroid gland and leads to potent suppression of serum PTH levels.

Methods

2MD is a new vitamin D analog that is highly selective for the bone and parathyroid gland and leads to potent suppression of serum iPTH levels. It has less calcemic activity at effective doses than calcitriol and paricalcitol. These characteristics are consistent with its high potency and effectiveness in suppressing PTH without significant perturbations of calcium and phosphorus.

Results

All eleven patients completed the study. At 4 weeks, the half-life (t1/2) of 2MD was 50.8 ± 25.8h, time to maximum plasma concentration (tmax) was 2.1 ± 1.4h, and concentration maximum (Cmax) was 204.3 ± 75.7pg*h/ml. Mean iPTH was suppressed 33% and calcium and phosphorus did not change.

Conclusions

In hemodialysis patients, 2MD has a much lower Cmax and AUC but is much longer t1/2 than calcitriol and paricalcitol. These characteristics are consistent with its high potency and effectiveness in suppressing PTH without significant perturbations of calcium and phosphorus.

References