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Authors	Hemmingway, Andrea;O'Callaghan, Karen M.;Hennessy, Áine;Kiely, Mairead E.
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**University College Cork, Ireland**  
 Coláiste na hOllscoile Corcaigh

A Hemmingway<sup>1,2</sup>, KM O'Callaghan<sup>1,2</sup>, Á Hennessy<sup>1,2</sup> and ME Kiely<sup>1,2</sup>

<sup>1</sup>Cork Centre for Vitamin D and Nutrition Research, <sup>2</sup>The Irish Centre for Fetal and Neonatal Translational Research (INFANT), University College Cork

## Introduction

Adverse effects of low vitamin D status and calcium intakes in pregnancy may be mediated through the calcium metabolic system, resulting in functional vitamin D deficiency, characterised by elevated PTH alongside low serum 25-hydroxyvitamin D [25(OH)D]<sup>1,2</sup>.

**Objective:** Examine the relative importance of serum 25(OH)D and calcium intake on PTH concentrations in white-skinned pregnant women resident at Northern latitude (51.9°N).

## Methods

Cross-sectional analysis of 142 healthy pregnant women at baseline of a vitamin D intervention trial [mean (SD) 14 (2) weeks' gestation]<sup>3</sup>. Serum 25(OH)D was measured using a CDC-accredited LC-MS/MS method<sup>4</sup> and vitamin D and calcium intakes were quantified using a validated quantitative FFQ<sup>5</sup>. Serum intact PTH and albumin-corrected calcium were measured by ELISA and colorimetric assay, respectively.

## Results

Mean (SD) 25(OH)D was 54.9 (22.6) nmol/L and 44% were <50 nmol/L<sup>2</sup>. Geometric mean (95% CI) PTH was 9.2 (8.4, 10.2) pg/mL and mean (SD) serum calcium was 2.2 (0.1) mmol/L.

Mean (SD) vitamin D intakes were 10.7 (5.2) µg/day.

Mean (SD) calcium intakes were 1183 (486) mg/day.

22% of women had a calcium intake <800 mg/day<sup>2</sup> and 63% had an intake ≥1000 mg/day<sup>2</sup>.

PTH was inversely associated with serum 25(OH)D ( $r = -0.311$ ) but not with calcium intake ( $r = -0.087$ ).

While 25(OH)D had a significant effect on PTH ( $P = 0.025$ ), there was no effect of calcium intake ( $P = 0.822$ ) and no nutrient-nutrient interaction ( $P = 0.941$ ).

## References

1. Kiely M *et al.* (2017) *Ther Adv Musculoskelet Dis* **9**(6), 145-54.
2. Institute of Medicine (2011) Washington (DC): National Academies Press.
3. O'Callaghan KM. *et al.* (2018) *Am J Clin Nutr* doi.10.1093/ajcn/nqy064.
4. Kiely ME *et al.* (2016) *Am J Clin Nutr* **104**(2), 354-61.
5. Kiely M *et al.* (2016) *J Hum Nutr Diet* **29**(4), 495-504.

Table 1. Pearson correlation coefficients (r) between components of the calcium metabolic system and vitamin D and calcium intakes.

		25(OH)D	Serum Calcium	Vitamin D intake	Calcium intake
PTH	r	<b>-0.311</b>	0.057	-0.132	-0.087
	(P)	<b>(&lt;0.001)</b>	(0.499)	(0.118)	(0.306)
25(OH)D	r		-0.092	<b>0.372</b>	0.064
	(P)		(0.276)	<b>(&lt;0.001)</b>	(0.448)
Serum calcium	r			0.058	0.064
	(P)			(0.493)	(0.450)
Vitamin D intake	r				<b>0.194</b>
	(P)				<b>(0.021)</b>

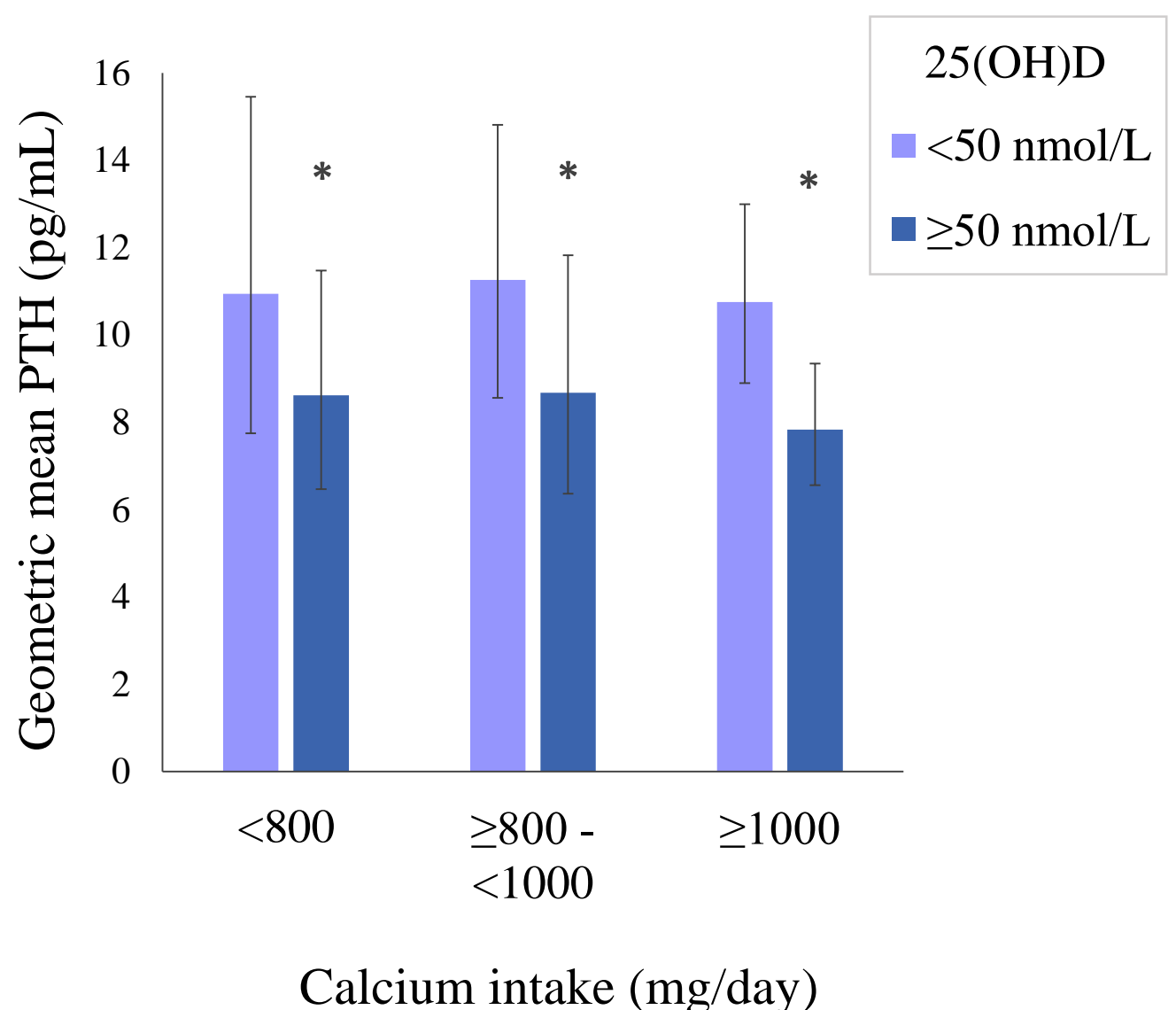


Fig. 1. PTH concentration stratified by 25(OH)D and calcium intake.

## Conclusion

The relative importance of circulating 25(OH)D and calcium intake to the calcium metabolic system vary according to the setting and ethnicity.

In this group of white-skinned women at Northern latitude, with largely sufficient calcium intakes, vitamin D status, but not calcium intake, was important for maintaining PTH.