

3-epi-25 hydroxyvitamin D₃ concentrations in Chilean children between 5 and 8 years

Mónica Arancibia^{1,2}, Cristián Seiltgens^{1,3}, Helena Poggi¹, Fidel Allende⁶, Sandra Solari⁶, Soledad Peredo¹, Claudia Trincado¹, Hernán García¹, Ivonne D'Aprémont^{1,4}, Rosario Moore¹, Sofía Sifaqui¹, D Andrade⁶, JT Ossa¹, Carlos Fardella⁵, Cristian Carvajal⁵, Carmen Campino⁵, Rene Baudrand⁵, Ximena Sánchez¹, Alejandro Martínez-Aguayo¹

¹Division of Paediatrics, Pontificia Universidad Católica de Chile, ²Paediatrics Unit, Hospital Higuera, Talcahuano, Chile, ³Paediatrics Unit, Hospital La Florida, Santiago, Chile, ⁴Complejo Asistencial Hospital Dr. Sótero del Río, Santiago, Chile. ⁵Endocrinology Department, Pontificia Universidad Católica de Chile. ⁶Department of Clinical Laboratories, Pontificia Universidad Católica de Chile, Santiago, Chile

Introduction

The C3 epimer of 25-hydroxyvitamin D₃ (Epi25OHD₃) is present in the paediatric and adult population, and varies according to age. It is still unknown if its measurement is clinically relevant and should be considered to classify Vitamin D status.

Objective

To measure 25OHD₃, 25-hydroxyvitamin D₂ (25OHD₂) and Epi25OHD₃ and to compare them with PTH and calcemia.

Subjects and methods

Subjects: Children between 5 and 8 years of age born very preterm (VPT: <32 weeks of gestation) and term (≥38 weeks of gestation), both adequate for gestational age (AGA).

Exclusion criteria: Small for gestational age (SGA; weight ≤ -2 SD), multiple pregnancy, chronic and acute disease and use of oral corticosteroids.

Measurements: 25OHD₂, 25OHD₃ and Epi25OHD₃ by mass spectrometry (LC-MS/MS) in serum samples.

25OHD₃ status (ng/mL): deficient <20, insufficient 20-30, sufficient ≥ 30

Total 25OHD₃: 25OHD₃ + Epi25OHD₃

Statistical test: U-Mann Whitney.

Results

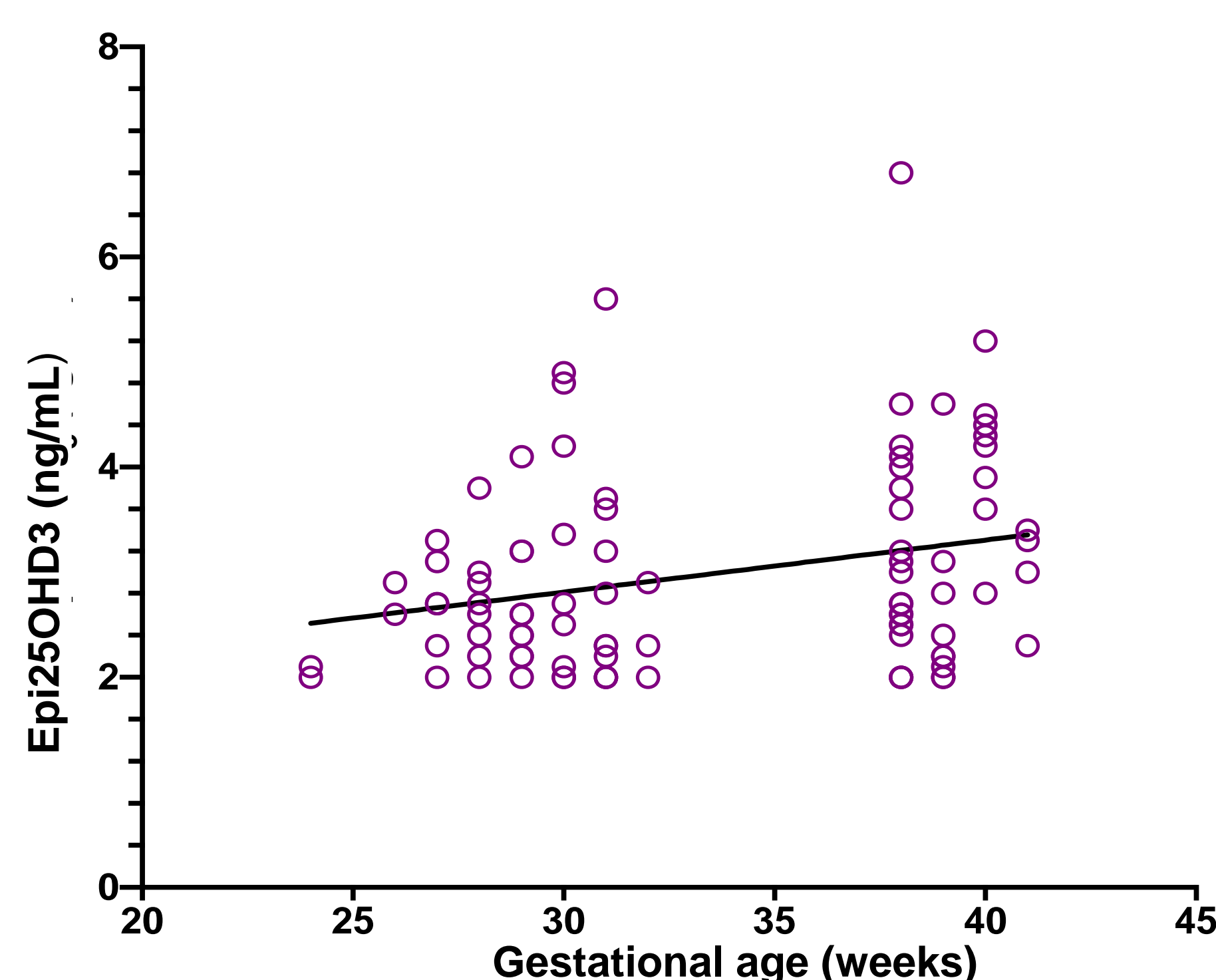
Table 1: General characteristics of the study population

	PRETERM (n=72)		TERM (n=41)		p value
	mean	SD	mean	DS	
Age (years)	6,60	0,90	6,70	1,00	0,535
Bone age (years)	7,20	1,40	7,20	1,30	0,903
Height (SDS)	-0,19	0,86	0,10	1,03	0,109
Abd. circumference (cm)	58,50	7,40	58,50	7,10	0,982
BMI (percentile)	59,00	32,00	64,00	29,00	0,476
Gestational age (weeks)	29,00	2,00	39,00	1,00	<0,001
Birth weight (SDS)	0,40	1,03	0,52	0,72	0,512
Birth length (SDS)	-0,23	1,23	0,56	1,10	<0,001

Seventy seven (83%) of 93 subjects (45% female) had detectable Epi25OHD₃ and only 2 subjects 25OHD₂ concentrations.

Epi25OHD₃ was associated with 25OHD₃ (r = 0.57, p <0.0001), calcemia (r = 0.84, p = 0.005) and PTH (r = 0.18, p <0.0001).

Fig. 1: Epi25OHD₃ concentrations and gestational age



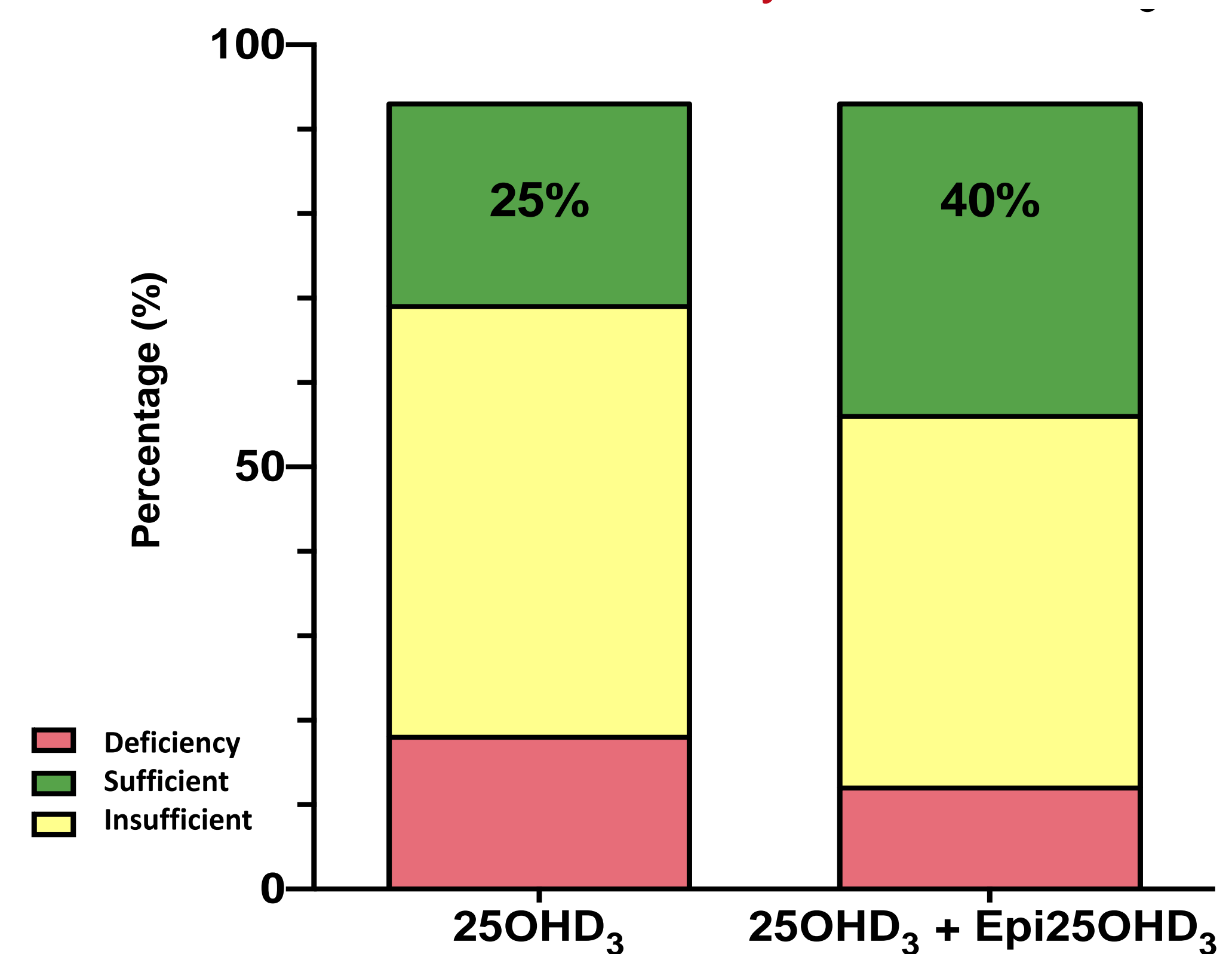
Gestational age was correlated to Epi25OHD₃ (r = 0.265, p = 0.011) and 25OHD₃ (r = 0.229, p = 0.036).

Table 2: Epi25OHD₃ percentage by gestational age

GESTATIONAL AGE	Epi25OHD ₃ / Total 25OHD ₃ (%)
PRETERM	9,7% [8,7 – 11,1]
TERM	10,6% [9,6 – 12,2]
TOTAL	10,2% [9,1 – 11,3]

Differences in the percentage of total Epi25OHD₃ / 25OHD₃ between VPT and term subjects was statistically significant (p = 0.04).

Fig. 2: Vitamin D status according to 25OHD₃ and total 25OHD₃ in children between 5-8 years



When categorizing Vitamin D status using total 25OHD₃, the percentage of children with a deficient and insufficient status dropped from 19.4% to 12.9%, and from 54.8% to 47%, respectively. On the contrary, the proportion of children with a sufficient status raised from 25.8% to 39.8%.

Conclusions

- ✓ Epi25OHD₃ concentrations found in children at school age, correlates with gestational age and is different in preterm than in term children.
- ✓ It is necessary to establish the physiological role of Epi25OHD₃, since when considered, it changed Vitamin D status in an important proportion of children.
- ✓ Including its measurement in routinely used immunoassays and their harmonization in this regard, could be relevant in the classification of Vitamin D status.

References

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