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RESEARCH IN BRIEF

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Vitamin D status in children with congenital melanocytic nevi

Connor T. Hughes MD[1,2,3] | Jusvinder Dadhra BSc, MIBMS[4] | Satyamaanasa Polubothu MD, PhD[1,2,3] | Veronica A. Kinsler MD, PhD[1,2,3]

[1]Paediatric Dermatology, Great Ormond Street Hospital for Children NHS Foundation Trust, London, UK

[2]UCL GOS Institute of Child Health, London, UK

[3]Mosaicism and Precision Medicine Laboratory, The Francis Crick Institute, London, UK

[4]Camelia Botnar Laboratories, Great Ormond Street Hospital for Children NHS Foundation Trust, London, UK

Correspondence
Veronica A. Kinsler, Paediatric Dermatology, Great Ormond Street Hospital for Children NHS Foundation Trust, London WC1N 3JH, UK.
Email: v.kinsler@ucl.ac.uk

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Abstract

Congenital melanocytic nevi (CMN) are rare, pigmented birthmarks that can predispose patients to melanoma of the central nervous system and skin. Data from non-CMN melanoma cohorts suggest that vitamin D levels may be connected to outcome, prompting this study of 25-hydroxyvitamin D levels in plasma samples from 40 children with CMN. While 27% were insufficient and 13% deficient, this was representative of European populations, and UK supplementation guidelines are already in place. Our data support routine vitamin D supplementation for all CMN patients during winter months, without routine serum measurement.

KEYWORDS
congenital melanocytic nevi, melanoma, vitamin D deficiency

1 | INTRODUCTION

Congenital melanocytic nevi (CMN) are pigmented birthmarks caused by mosaic oncogenic mutations, and as such are a risk factor for childhood melanoma. As CMN-associated melanoma in childhood often arises in the central nervous system and very rarely, in childhood, in the skin,[1] the risk is unlikely to be strongly related to ultraviolet radiation (UVR) and more related to the underlying genetics. For this reason, we advocate only standard good sun protection measures for affected children in our practice. However, data from non-CMN melanoma in the general population have suggested a link between vitamin D and cutaneous melanoma stage. Lower serum vitamin D has been suggested to be associated with more advanced (T3/T4) melanoma stage.[2,3] Optimization of vitamin D levels in patients with CMN may therefore be sensible practice, particularly given the high prevalence of Vitamin D deficiency within pediatric populations of Europe including the UK.[4] In addition, we are aware from our practice that parents sometimes follow much stricter sun protection measures than we would consider necessary, which could impact serum vitamin D. We sought to establish levels of serum Vitamin D in a pediatric population with CMN with a view to assessing whether these might require routine measurement and/or supplementation.

2 | SUBJECTS AND METHODS

With informed written consent under research ethics committee approval, we measured 25-hydroxyvitamin D from stored plasma samples from 40 children with CMN. These had been collected between 2007 and 2020 spread throughout the years for an unconnected study. Mean (standard error of the mean) and median (range) ages of the cohort were 8.4 years (0.9) and 7.9 years (0.33–18), respectively. Further demographic data on the patients in this study are available in

TABLE 1 Demographics of the patients in our study categorized by gender, age, either single or multiple (>1 at birth) CMNs, and projected adult size (PAS) stratified by size <10 cm, 10–20 cm, 20–40 cm, 40–60 cm, >60 cm, and no single larger lesion. Four patients were excluded from projected adult size, classification due to this data not being captured in database at enrollment.

	Number	%
Gender		
Male	17	42.5
Female	23	57.5
Age at collection		
<1 year	2	5
1–10 years	22	55
11–18 years	16	40
CMN phenotype		
Single CMN	6	15
Multiple CMN	34	85
Projected adult size (PAS)		
<10 cm	6	15
10–20 cm	7	17.5
20–40 cm	9	22.5
40–60 cm	4	10
>60 cm	9	22.5
No single larger lesion	1	2.5
PAS not recorded	4	10

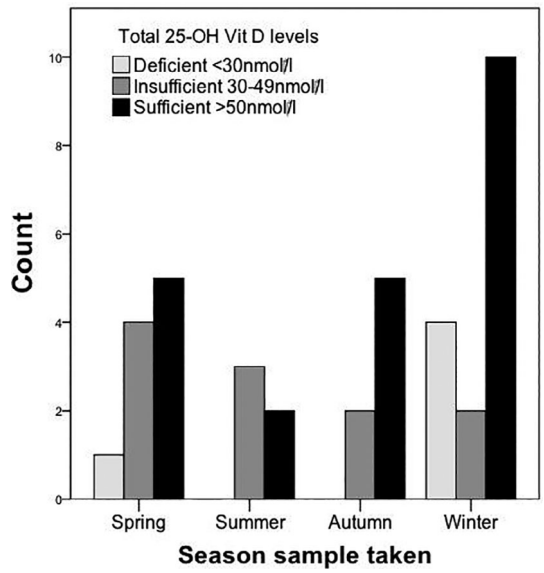

FIGURE 1 Vitamin D levels in children with CMN measured throughout the year.

Table 1. None of the patients were taking vitamin D supplementation at the time of sampling and plasma samples were measured by mass spectrometry assay (MassTrak Vitamin D Kit 5793, Waters Corp., Milford, MA).

3 | RESULTS

Mean and median 25-hydroxy Vitamin D were 63.0 nmol/L (5.3) and 57.0 nmol/L (12–151) respectively. Twenty-seven percent of levels were deemed insufficient (30–49 nmol/L), and 13% deficient (<30 nmol/L) by age-matched UK standards used in the hospital diagnostic laboratory. We have stratified the 25-hydroxy Vitamin D results of our cohort in Figure 1. Multiple linear regression in this cohort demonstrated that total vitamin D levels were not statistically significantly influenced by age, sex, CMN projected adult size (PAS), or season in which the sample was taken, however due to the relatively restricted sample size it is possible that these analyses are underpowered.

4 | DISCUSSION

Our study demonstrates that children in the UK with CMN have a high prevalence of vitamin D insufficiency and deficiency, but this prevalence is comparable to that observed in general European populations.[4] Current UK National Institute of Clinical Excellence (NICE) guidelines are that deficiency should be treated with high-dose Vitamin D followed by daily maintenance, while all individuals (children and adults) should consider taking 10 micrograms (400 IU) of Vitamin D maintenance daily.[5] In addition, NICE stresses that at-risk children, including those who wear clothes with little skin exposure outdoors, which likely includes many CMN patients, take 10 micrograms (400 IU) of Vitamin D throughout the year. One of the limitations of our study was the lack of data on photoprotection practices of our cohort, and the relatively severe phenotypic spectrum. These recommendations would therefore not necessarily be applicable to children with a single small CMN.

Taken together, these data and recommendations suggest that children with CMN take daily 10 μg (400 IU) supplements at least during the winter months (from late September until early April). This is the standard evidence-based guideline from the National Health Service (NHS) for vitamin D supplementation for the general population of adults and children over 5 years old in the UK.[6] Given these pre-existing guidelines and the lack of difference between levels in our patient population and the normal population, actual measurement of serum vitamin D is not merited in patients with CMN.

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CONFLICT OF INTEREST STATEMENT

No conflicts of interest to disclose.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

INFORMED CONSENT

All parents provided written informed consent.

CONSENT FOR PUBLICATION

All authors provided consent for publication.

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