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THE RELATIONSHIP BETWEEN VITAMIN D STATUS, LIMB MOVEMENTS, AND SLEEP ARCHITECTURE IN CHILDREN

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Background

- Vitamin D deficiency has recently been posited as an important factor in the pathogenesis of restless leg syndrome.
- We evaluated the association between vitamin D deficiency and limb movements and sleep architecture in a pediatric sample.

Methods

- This is a retrospective analysis of a single institution sleep program looking at all patients who underwent overnight polysomnogram and 25-OH vitamin D within 60 days of doing the sleep study between January 2015 and October 2017.
- Those with sleep apnea (Central Apnea Index >5/hr or Obstructive Apnea Hypopnea Index >2/hr) were excluded.

Results

Variable	Value (mean, [SE]), n=83
Age (yrs)	7.0 (0.4)
Vitamin D	34.2 (1.3)
Sleep architecture	
N1	4.5 (0.2)
N2	44.4 (1.1)
N3	32.7 (1.2)
R	18.5 (0.5)
Arousals	
Total AI	8.7 (0.3)
Spontaneous AI	3.5 (0.2)
Limb movement AI	4.5 (0.3)
Limb movements	
Total LMI	9.1 (0.7)
Periodic LMI	3.0 (0.5)
Single LMI	6.0 (0.3)

Variable	Pearson Correlation with vitamin D level (*p<0.05, **p<0.01)
Age (yrs)	-0.19
Sleep architecture	
N1	-0.15
N2	-0.19
N3	0.26*
R	-0.11
Arousals	
Total AI	-0.13
Spontaneous AI	-0.15
Limb movement AI	0.006
Limb movements	
Total LMI	-0.03
Periodic LMI	-0.06
Single LMI	0.03

Variable	Vitamin D >/=30 (n=48)	Vitamin D <30 (n=35)	2 tailed p-value
Age (yrs)	6.6 (3.8)	7.4 (4.1)	0.375
Sleep architecture			
N1	4.3 (2.3)	9.4 (8.0)	0.541
N2	43.7 (12.0)	45.3 (8.1)	0.508
N3	33.4 (13.0)	31.8 (9.5)	0.535
R	18.8 (5.5)	18.0 (4.3)	0.502
Arousals			
Total AI	8.6 (3.3)	8.8 (4.0)	0.785
Spontaneous AI	3.6 (2.2)	3.3 (2.1)	0.666
Limb movement AI	4.4 (2.6)	4.6 (3.3)	0.785
Limb movements			
Total LMI	8.8 (5.6)	9.4 (8.0)	0.702
Periodic LMI	2.7 (3.2)	3.5 (6.9)	0.486
Single LMI	6.1 (3.4)	5.9 (2.6)	0.754

Results (cont)

- There were a total of 83 children who qualified for inclusion. Mean age was 7.0 years (range 1–17 years).
- Overall, higher Vitamin D level was significantly associated with increasing N3 sleep (r=0.267, p=0.015), but was not significantly associated with other sleep parameters including limb movements.
- In multivariate regression modelling including Vitamin D and age, the association between vitamin D and N3 sleep percentage remained significant (B=0.212, SE=0.102, p=0.04).

Conclusions

- Overall, there is a weak positive correlation between vitamin D and N3 sleep, even independent of age.
- In contrast, there was no association between any limb movement parameter and Vitamin D status.
- Further investigation is needed to better define the role of Vitamin D in sleep physiology.