

Is Vitamin D Level associated with Deformity or Back Pain in Adolescent Idiopathic Scoliosis?



Tara Korbal, BA¹, Matthew Darlow, MD², Claudia Leonardi, PhD²,
William Accousti, MD², R. Carter Clement, MD, MBA²

LSUHSC School of Medicine¹ Department of Orthopaedic Surgery²

Introduction

- Vitamin D plays an important role in bone health, including development of specific deformities.
- Some authors have also suggested that vitamin D deficiency may precipitate certain osteochondroses and other types of bone-related pain.
- However, the impact of low vitamin D on the adolescent spine has not been clearly elucidated.
- The present study investigates the associations of Vitamin D level with spine deformity and pain in patients diagnosed with adolescent idiopathic scoliosis (AIS).

Methods

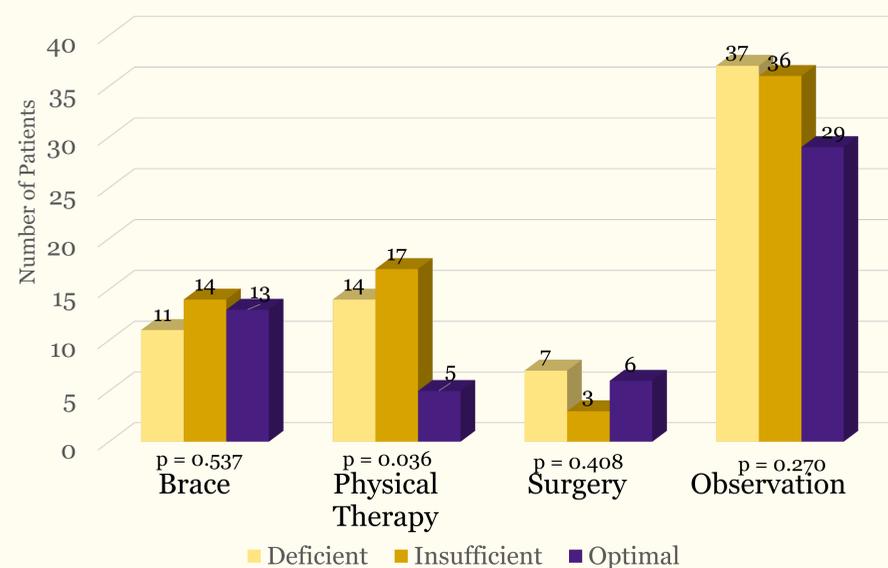
- A retrospective chart review, ages 10-17, diagnosed with AIS between 01/01/2018 and 12/31/2021.
- Academic tertiary free-standing children's hospital.
- Patients with surgery prior to diagnosis were excluded.
- Variables collected include demographic and clinical patient characteristics and Vitamin D level.
- Summary statistics and univariate associations (Chi-square test or analysis of variance) were produced using SAS/STAT software.

Patient Demographics

Characteristics	Deficient (n = 64)	Insufficient (n = 59)	Optimal (n = 52)	p-value
Age, years (mean, SD)	12.8 (1.5)	13.0 (1.5)	12.8 (1.4)	0.742
Weight, kg (mean, SD)	68.0 (24.6)	65.5 (21.1)	57.1 (11.4)	0.013
Cobb angle, ° (mean, SD)	24.3 (13.1)	19.9 (12.1)	24.0 (11.9)	0.108
Sex, % (n)				0.855
Female	76.6 (49)	72.9 (43)	76.9 (40)	
Male	23.4 (15)	27.1 (16)	23.1 (12)	
Race, % (n)				0.001
Black or AA	51.6 (33)	32.2 (19)	17.3 (9)	
White or Caucasian	35.9 (23)	47.5 (28)	67.3 (35)	
Other	12.5 (8)	11.9 (7)	9.6 (5)	
Declined to report	0 (0)	8.5 (5)	5.8 (3)	
Insurance, % (n)				0.125
Medicaid	65.6 (42)	66.1 (39)	50.0 (26)	
Private	28.1 (18)	32.2 (19)	48.1 (25)	
Self-pay	6.3 (4)	1.7 (1)	1.9 (1)	

Vitamin D levels were defined as: deficient (<20 ng/ml), insufficient (20 – 30 ng/ml), and optimal level (>30 ng/ml). SD =Standard deviation.
AA=African American

Treatment post diagnosis



Clinical Characteristics

Characteristics	Deficient (n = 64)	Insufficient (n = 59)	Optimal (n = 52)	p-value
Lenke classification –				0.794
Curve Type, % (n)				
1	50.0 (32)	45.8 (27)	50.0 (26)	
2	1.5 (1)	3.4 (2)	7.7 (4)	
3	0 (0)	0 (0)	0 (0)	
4	0 (0)	1.7 (1)	0 (0)	
5	43.8 (28)	45.8 (27)	38.4 (20)	
6	4.7 (3)	3.3 (2)	3.9 (2)	
Risser stage, % (n)				0.264
0	29.7 (19)	37.3 (22)	25.0 (13)	
1	10.9 (7)	18.6 (11)	17.3 (9)	
2	9.4 (6)	10.2 (6)	21.2 (11)	
3	15.6 (10)	10.2 (6)	5.8 (3)	
4	23.4 (15)	15.3 (9)	26.9 (14)	
5	10.9 (7)	8.5 (5)	3.9 (2)	
Pain in chart, % (n)	54.7 (35)	61.0 (36)	55.8 (29)	0.794

Conclusions

- 70% of AIS patients in our study population were in the deficient/insufficient vitamin D range.
- No correlation between vitamin D level and clinical characteristics including curve magnitude, curve type, or reported back pain.
- Race distribution differed among the vitamin D levels.
- As Vitamin D increased the prevalence of African American decreased and White increased.
- Further research is needed to determine how to best manage bone health in AIS patients
- This study provides the most robust data to-date on the prevalence and potential impact of vitamin D deficiency in this population.