

Vitamin D Deficiency in Children/Adolescent Presenting with Night Time Legs Pain

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ABSTRACT

Objective: To determine the frequency of vitamin D deficiency in children/adolescent presenting with night time leg's pain at Sheikh Khalifa Bin Zayed Al Nahyan Hospital Ak CMH Muzaffarabad.

Methodology: This was a cross-sectional study, which was conducted at the pediatric Department SKBZ/CMH Muzaffarabad, during six months from July 2021 to December 2021. All the adolescent children presented with leg's pain during sleep at night and both genders presenting at paediatric OPD were included. After obtaining informed consent, a 3ml blood sample was obtained from each case and immediately sent to the Hospital diagnostic laboratory to assess the vitamin D level. All demographic information, including vitamin levels, were documented via study proforma and SPSS version 26 was used to enter and analyze all of the data.

Results: A total of 60 adolescent children who presented with leg's pain were studied to observe their vitamin D levels and their average age was 05.93+2.94 years. Out of all, 40 (66.7%) cases were males and 20 (33.3%) were females.

Only two children were found with normal vitamin D level, and from all of the remaining 50.0% had vitamin D deficiency (<20 ng/mL) and 46.7% had insufficiency (20–30 ng/mL). Vitamin D deficiency was statistically significant according to age ($p=0.006$), whereas it was statistically insignificant according to gender ($p=0.117$).

Conclusion: Vitamin D deficiency was observed to be higher among almost all the cases presented with leg's pain during the night. This was an alarming situation to our current generation. According to these findings, it is estimated that vitamin D deficiency increases with increasing age.

Keywords: Vitamin D, deficiency, children, leg's pain

INTRODUCTION

Pain of the legs that interrupts the sleep of adolescent's children, and also their parents' sleep, is a common occurrence in clinical practice.¹ Here, the most important question to answer is if there is an overt disease process or if it is a more 'benign' state.¹ leg's pain and discomfort that occur in youngsters at night are known as growing pains. Growing pain typically begins between the ages of 3 years and 12 years. The majority of children with growing pains experience discomfort in their thighs, shins, calves, or behind knees.² The pain usually affects both legs and is not associated with arthralgia. Children occasionally experience arm pain in addition to leg pain, but they do not experience arm pain exclusively.² Growing pains are most common in the late afternoon or early evening before bedtime, but they can occasionally awaken the sleeping child.² Amongst the most common reasons of persistent musculoskeletal discomfort in children is growing pains.³ Even though the presentation is caused by a separate ailment, parents frequently refer to numerous musculoskeletal pain issues in their growing children as "growing pains." As a result, professionals are frequently asked to assess whether a patient's symptoms are due to growing pains or to anything else.^{3,4} Although the reason of growing pains is unknown, there are numerous ideas about its origin. Even though the term "growing pains" is already used in published research for over 190 years, the reason and best treatment for such symptoms are unknown.⁵ Considering calcium and vitamin D metabolism as an interesting method because proper dietary intake of these nutrients is critical for maintaining normal bone mineralization and muscular performance.^{5,6} Vitamin D deficiency has now been recognized as having proapoptotic, immunomodulatory and anti-inflammatory properties in addition to regulating calcium-phosphorus equilibrium and bone metabolism.^{7,8} As a result, vitamin D deficiency, which seems to be a potentially preventable illness, is important for musculoskeletal pain in individuals.⁷ In a study from turkey it was anticipated that vitamin D deficiency may be a contributing factor of the growing pains among children, and that vitamin D supplementation would reduce the level of discomfort reported and in that study, 61.6 percent of children were vitamin D deficient, and after

supplementing with vitamin D for three months, there was a significant reduction in pain levels.^{3,5} After taking some above proofs and controversies this study has been done to observed the frequency of vitamin D deficiency in children/adolescent presenting with night time legs pain at Sheikh Khalifa Bin Zayed Al Nahyan Hospital Ak CMH Muzaffarabad.

MATERIAL AND METHODS

This was a cross-sectional study, which was conducted at paediatrics Department SKBZ Al Nahyan Hospital AK CMH Muzaffarabad, during six months from July 2021 to December 2021. All the adolescent children presented with leg's pain during sleep at night and both genders presenting at paediatric OPD were included. All the children were already known cases of vitamin D deficiency and were on supplementation of vitamin D, patients having a confirmed diagnosis of any organic disease in their extremity, history of any other chronic disease, jaundice, patients with potential rheumatological or orthopaedics joint abnormalities, and children on vitamin D supplements and those who refused to participate in the study were excluded. After obtaining informed consent, a 3ml blood sample was obtained from each case and immediately sent to the Hospital diagnostic laboratory to assess the vitamin D level. Vitamin D deficiency was defined as a serum 25 (OH) vitamin D level of less than 20 ng/mL, insufficiency at 20–30 ng/mL, and more than 30 ng/mL was considered as normal. All the costs of the vitamin D blood test were covered by the researcher. All demographic information, including vitamin levels, were documented via study proforma and SPSS version 26 was used to enter and analyze all the data.

RESULTS

In this study, a total of 60 adolescent children presented with leg's pain were studied to observe their vitamin D levels and their average age was 05.93+2.94 years. Overall average vitamin D level was 20.9+6.49 ng/mL and average serum calcium level was 9.47+0.82 mg/dl. Out of all, 40 (66.7%) cases were males and 20 (33.3%) were females. Table.1

Only two children were found with normal vitamin D level, and from all of the remaining 50.0% had vitamin D deficiency (<20 ng/mL) and 46.7% had insufficiency (20–30 ng/mL). Fig-1

Vitamin D deficiency was significantly high among cases aged more than 5 years and insufficiency was significantly high in children aged less than 5 years, while both normal cases were aged less than 5 years (p-0.006). Although vitamin D deficiency was statistically insignificant according to gender (p-0.117). Table.2

Table 2: Descriptive statistics of demographic characteristics n=60

Variables	Statistics
Age (years)	05.93+2.94
Vitamin D level	20.9+6.49 ng/mL
Serum calcium	9.47+0.82 mg/dl
Gender	
Males	40(66.7%)
Females	20(33.3%)

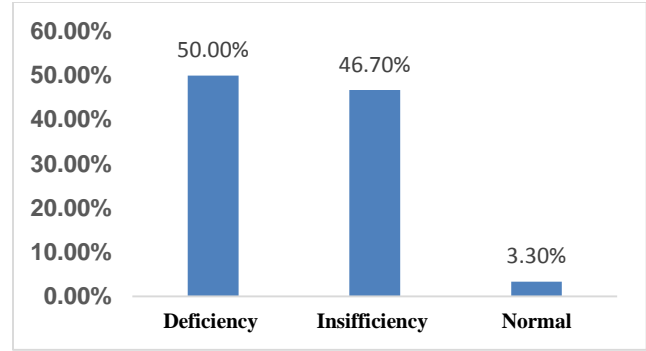


Fig 1: Frequency of vitamin D deficiency among children n=60

Table 2: Vitamin D efficiency according to age and gender n=60

Variables	Vitamin D level			Total	p-value	
	Deficiency	Insufficiency	Normal			
Age groups	<5years	Count	10	20	2	0.006
		%	16.7%	33.3%	3.3%	
	>5years	Count	20	8	0	
		%	33.3%	13.3%	0.0%	
Gender	Males	Count	20	20	0	0.117
		%	33.3%	33.3%	0.0%	
	Females	Count	10	8	2	
		%	16.7%	13.3%	3.3%	

DISCUSSION

Growing pains (GP), a well-known clinical phenomenon, is thought to be a common occurrence in roughly 25 to 40% of children who have no intrinsic pathology.^{9,10} Hypo-vitaminosis D has been connected to Non-specific musculoskeletal pain in otherwise healthy persons and the elderly, and it could be a specific clinical presentation of Hypovitaminosis D among children.⁹ In this study, a total of 60 adolescent children presented with leg's pain were studied to observe their vitamin D levels and their average age was 05.93+2.94 years. Overall average vitamin D level was 20.9+6.49 ng/mL and average serum calcium level was 9.47+0.82 mg/dl. Of these, 40 (66.7%) cases were males and 20 (33.3%) were females. Similarly, Haque M et al¹¹ reported that the average age of the study participants was 7.86 2.71 years, with males accounting for the majority of the participants (60.78 percent), the average concentration was 9.470.78 mg/dl and the average vitamin D concentration was 17.535.48 ng/ml. However, Qamar S et al⁹ reported that the mean age of the study subjects was 8.05+2.28 years and inconsistently they found females in majority 59%. In the study of Vehapoglu A et al⁵ also found female children in majority 56.6% and males 43.4% with overall average age of 7.8±2.6 years and they found lower average of 25(OH)D, 13.4±7.2 ng/ml and average of serum calcium level was almost similar to this study as 9.7±0.3 mg/dl. In a local study from Karachi by Moorani KN et al¹² also reported that there were 56% boys and 44% girls among the 120 children and the average vitamin D concentrations was 22.814.80 ng/ml and these findings were almost similar to this study.

In this study only children were found with normal vitamin D level, and from all of the remaining 50.0% had vitamin D deficiency (<20 ng/mL) and 46.7% had insufficiency (20–30 ng/mL). Consistently Qamar S et al⁹ reported that the hypovitaminosis D was discovered in 94 percent of children with growing pains, with 72 percent of them being deficient. On other hand Vehapoglu A et al⁵ also found that vitamin D deficiency was found in 104 of the 120 youngsters with growing pains (86.6 percent). Haque M et al¹¹ conducted a case control study, in their vitamin D and calcium concentrations among growing pains children were assessed to evaluate the link between vitamin D insufficiency and GP and they observed that vitamin D insufficiency was significantly high in 92.15 percent of children with growing pain and 48 percent of

children in the control group. In the study of Naiboğlu, S et al⁷ reported that the leg pains are the commonest among boys and girls and growing pains are the most prevalent non-inflammatory reasons of muscle-joint pain among children and vitamin D deficiency should be investigated in individuals having musculoskeletal discomfort and further they observed that the out of all 103 cases sever vitamin D deficiency was in 9.7% cases, deficiency was in 23.4% cases and insufficiency was in 40.8% of the cases. In the favor of this study Sharma S et al¹³ demonstrated that the children aged 3 to 12 years who presented with the growing pains are more likely to have vitamin D deficiency than children who had not growing pains. Findings of this study were also correlated with the study of Park MJ et al¹⁴, in which they reported that in Korean children having nonspecific pains of lower-extremities had a high rate of vitamin D insufficiency or deficiency, demonstrating a link between growing pains and the deficiency of vitamin D. In this study, vitamin D deficiency was significantly high among cases aged more than 5 years and insufficiency was significantly high in children aged less than 5 years, while both normal cases were aged less than 5 years (p-0.006). Although vitamin D deficiency was statistically insignificant according to gender (p-0.117). Previously, Oster discovered that up to 15% of school-aged children had occasional limb discomfort,¹⁵ and Scutter and Evans recently reported a proportion of 37% in children between the ages 4 to 6 years in an Australian large community-based study.¹⁶ The majority of children with GP are between the ages of 3 years and 12 years.¹⁷ One of the most vital vitamins in our bodies is vitamin D. It is made from 7-dehydrocholesterol, which is converted to pre-vitamin D3 using ultraviolet B radiations.¹⁸ Vitamin D deficiency is one of the most common medical issues that people in our country facing. However, the general public, particularly children, is still unaware of how this could harm their health. Few studies are published in our country to look into vitamin D insufficiency in children. Future research might concentrate on the long-term effects; in particular, large-scale studies would be preferable to follow up on individuals who had vitamin D deficiency as children and see how it affected their adult lives.

CONCLUSION

Vitamin D deficiency was observed to be higher among almost all the cases presenting with leg's pain at night. This is an alarming

situation to our new generation. According to these findings, it is estimated that vitamin D deficiency increases with increasing age. When children reach the age of four to five, they should pay special attention to their vitamin D levels in their diets or supplementation. Strategies should be developed for the growing children to diagnosis and management of vitamin D levels to cure the proper growth and prevent the comorbidities. As per several limitations of the study, further large-scale studies are recommended on this subject.

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