

Original Research Article

To study the levels of serum vitamin 25 (OH) D in children aged 6 months to 6 years with recurrent wheeze

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Abstract

Background & Methods: The aim of this study is to study the level of serum vitamin 25 (OH) D in children aged 6 months to 6 years with recurrent wheeze. In this study serum vitamin 25 (OH) D levels are compared between children having recurrent wheeze with controls or healthy children of same age and nutritional status. The children were divided into two groups. The first group was the study group with 50 children admitted or presenting in OPD with wheezing or with a history of recurrent wheezing and the second group was control group with 50 healthy children.

Results: The comparison of mean serum vitamin 25(OH) D levels between cases and controls shows that the difference in mean 25(OH) D levels were significant among age groups of 6 months to 23 months and 24 months to 47 months but was not found to be significant in the 48 months to 72 months age group.

Conclusion: To study serum vitamin 25(OH) D level in children with recurrent wheeze in the age group of 6 months to 6 years. A total of 50 cases and 50 controls were selected. Both groups were divided in three age groups, keeping their distribution similar and level of serum vitamin 25 (OH)D was estimated. The difference of serum vitamin 25(OH) D levels were statistically significant in two age groups-6 month to 23 month and 24 month to 47 month with [p=0.032] and [p=0.047] respectively.

Keywords: serum, vitamin, children & wheeze.

Study Design: Observational Study.

1. Introduction

Wheeze is a musical and continuous sound that originates from oscillations in narrowed airways. Wheezing is heard mostly on expiration as a result of critical airway obstruction. Wheezing can be polyphonic (various pitches)-when there is widespread narrowing of airways causing various levels of obstruction to airflow or Monophonic (single pitch sound) produced in larger airways during expiration as in tracheomalacia and laryngomalacia[1].

Infants and young children are more prone to wheeze, owing to different set of lung mechanics. Obstruction to flow is affected by airway caliber and lung compliance. Resistance to airflow through a tube is inversely related to the radius of the tube to 4th power[2].

Immunologic and molecular influences can contribute to infants propensity to wheeze. In comparison to older children and adults, infants tend to have higher levels of lymphocytes and neutrophils, rather than mast cells and eosinophils, in bronchoalveolar lavage fluid[3].

The childhood wheezing phenotype has been linked to many early exposures including fetal nutrition, maternal smoking, prenatal and birth related complications, prenatal and neonatal exposure to antibiotics, exposure to high levels of environmental allergens and high infant adiposity[4].

The wheezing tendency and bronchial hyper-responsiveness recover by the age of 3years in transient wheezers and by the age of 6 years in non-atopic persistent wheezers, but both seems to continue through childhood and adolescence in atopic persistent wheezers[5].

2. Material and Methods

Present study was conducted at Tertiary Care Centre of MP. In this study serum vitamin 25 (OH) D levels are compared between children having recurrent wheeze with their controls or healthy children of same age and similiar nutritional status. The children were divided into two groups. The first group was study group with 50 children admitted or presenting in OPD with wheezing or with a history of recurrent wheezing. Second was control group with 50 healthy children. Consent was taken appropriately from parents.

INCLUSION CRITERIA

- Children between 6 months to 6 years of age having symptoms suggestive of airflow obstruction and recurrent wheeze and sign like generalised ronchi

EXCLUSION CRITERIA

- Any accompanying anatomic abnormality suspected clinically.

3. Result

Table 1: Sex wise Distribution

Sex	Case		Control	
	No.	%	No.	%
Male	36	72	28	56
Female	14	28	22	44

Above table shows that distribution among both sexes was almost similar between the cases and controls.

Table 2: Nutrition wise distribution

Age groups (months)	Case	Control
	No.	No.
6 months – 23 months	87.311±12.11	88.343±9.23
24 months – 47 months	86.662±10.07	88.612±4.66
48 months – 72 months	86.368±2.89	85.884±10.29

In this study, majority of children had normal weight for height and control were nutritionally similar in all age groups.

Table 3: Comparison of mean S. Vitamin 25(OH) D levels in different age groups

Age groups (months)	Case	Control
	No.	No.
06 months – 23 months	87.245±12.11	88.433±9.23
24 months – 47 months	86.423±10.07	88.122±4.66
48 months – 72 months	86.225±2.89	85.614±10.29

Comparison of mean serum vitamin 25(OH) D levels between cases and controls, Difference in mean 25(OH) D levels was significant among age groups of 6 months to 23 months and 24 months to 47 months but was not found to be significant in the 48 months to 72 months age group.

Table 4: Comparison of mean Serum Vitamin 25 (OH) D levels with weight for height (%ile)

Grade of weight for height %ile	Mean S. Vitamin 25 (OH) D levels	
	Case	Control
Normal (median to + 2 SD)	23.12±14.31	33.44±16.33
Between median & - 1 SD	17.66±1.50	37.10 ±00.0
Between - 1 & - 2 SD	16.64±17.21	31.82±11.27
Between - 2 & - 3 SD	16.15±7.23	43.03±6.87
Less than - 3SD	14.88±10.13	33.75±1.06

Among cases mean serum vitamin 25(OH) D levels was found to be maximum in children with normal weight for height percentile (median to +2 SD) and among controls mean vitamin 25(OH) D levels were maximum in children with weight for height percentile lying between - 2 and -3 SD.

4. Discussion

Wheezing as a manifestation is a very common problem both in India and other parts of world, so a lot of methods of prevention have been studied and role of micronutrients are being searched for. The non-hormonal role of vitamin D is now known and its influence on immune functions have also been researched a lot recently[6].

This study was done to know the vitamin D status among the children in central India who are affected by such recurrent episodes of wheezing and compare them with controls and to study the role of vitamin D in etiopathogenesis of wheezing episodes.

It can be inferred from above data that significant difference among cases and controls was more common in the age group of 6 months to 47 months or in other words below 4 yrs[7]. Above data also signifies that deficiency of vitamin D is not so prevalent in central India among healthy children of this age group (depicted among controls) as studied in other parts of country.

Children above 4 years of age were less deficient in vitamin D in our study, which might suggest that nutritional intake improves with age and may be that older children are involved in more outdoor activities than the younger age group leading to sunlight exposure and hence the sufficient levels[8].

Mean serum vitamin 25(OH) D levels were also compared with weight for height percentile of cases and controls. While among cases mean serum vitamin D levels was found maximum in children with weight for height percentage lying between median and more than 2SD from median. Hence vitamin D levels were affected by nutrition among cases[9]. In control group, maximum serum vitamin 25(OH) levels was found among children with weight for height percentile lying between -2 and -3 SD. Thus, showing that among non wheezers mean vitamin D levels was not dependent on nutrition levels[10].

5. Conclusion

Serum vitamin 25(OH) D levels in children with recurrent wheeze in the age group of 6 months to 6 years were estimated in this study. A total of 50 cases and 50 controls were selected. Both groups were divided in three age groups, keeping their distribution similar and levels of serum 25 (OH)D were estimated. The difference of Vitamin D levels was statistically significant in two age groups-6 month to 23 month and 24 month to 47 month with [p=0.032] and [p=0.047] respectively.

6. References

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