

Observational Study of Serum Vitamin D Levels in Children Under Five Years with Recurrent Respiratory Tract Infection

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Abstract: *OBJECTIVES:* Observational study of serum vitamin D levels in children under five years suffering from recurrent respiratory tract infection. *METHOD:* A retrospective observational study was carried out in pediatrics OPD and Inpatient department, RIMS, Ranchi. The study included 75 children with recurrent respiratory tract infection and 75 children with RTI who were selected randomly. Serum 25(OH)D levels were detected and estimated by chemiluminescence method. *RESULTS:* A total of 150 children of under five age group were enrolled in the study. Among 75 cases, the mean vitamin D level in patients with recurrent RTI was 12.71 ng/ml which was lower than the patients with RTI who had a mean of 14.40 ng/ml. *CONCLUSION:* Vitamin D is involved in regulating innate and adaptive immune functions. Children with recurrent respiratory tract infections have lower serum vitamin D levels than those with respiratory tract infection.

Keywords: Acute respiratory infection (ARI), respiratory tract infection (RTI), recurrent RTI, under five children, vitamin D

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I. Introduction

Infections of the respiratory tract are the most common human ailment^[1]. ARI is an important cause of morbidity in children. According to WHO (1999), every year ARI in young children is responsible for an estimated 3.9 million deaths worldwide. On an average, children below 5 years of age experience about 5 episodes of ARI per child per year thus accounting for about 238 million attacks^[1]. Vitamin D is recognized as the sunshine vitamin. It is also proved to be a prohormone with numerous functions in the body. Vitamin D is thought to have roles in improvement of immunity and in reducing inflammation. Vitamin D induces the expression of two antimicrobial peptides—cathelicidin and β -defensin—that play a key role in innate immunity owing to their chemotactic action and toxin neutralization^[2]. Accordingly, there is evidence that consumption of vitamin D may reduce respiratory tract infection (RTI) susceptibility in children^[3,4].

Objectives

To compare serum vitamin D levels in children under five years suffering from RTI and those with recurrent RTI

II. Methods

A retrospective observational study was carried out in pediatrics OPD and Inpatient department, RIMS, Ranchi. The study included 75 children with RTI and 75 children with recurrent RTI. The most widely accepted definition of recurrent RTI is the occurrence of eight or more documented airway infections per year in preschool-age children (upto 3 years of age), or of six or more in children older than three years of age, in the absence of any underlying pathological condition. Serum 25(OH)D levels were detected and estimated by chemiluminescence method. For categorical analysis of the vitamin D status, cut off values of ≥ 30 ng/mL for sufficiency, 20–30 ng/mL for insufficiency, 10–20 ng/mL for deficiency, and ≤ 10 ng/mL for severe deficiency were set.

III. Results

A total of 150 children of under five age group were enrolled in the study. The serum 25(OH)D levels of the 150 children were estimated. Among 75 cases, the mean vitamin D level in patients with recurrent RTI was 12.71 ng/ml which was lower than the patients with RTI who had a mean of 14.40 ng/ml.

Table 1 : Age distribution among the two groups

Age	Patients with RTI (%)	Patients with recurrent RTI (%)
<12 months	38 (50.00%)	29 (38.66%)
12 - 35 months	18 (24.00%)	13 (17.33%)
36 - 60 months	19 (25.33%)	33 (44.00%)

Table 2 : Gender distribution among the two groups

Gender	Patients with RTI (%)	Patients with recurrent RTI (%)
Male	38 (50.60%)	36 (48.0%)
Female	37 (49.33%)	39 (52.0%)

Table 3 : Vitamin D levels among the two groups

Group	Mean vitamin D level (ng/ml)
Patients with RTI	14.40
Patients with recurrent RTI	12.71

IV. Conclusion

Vitamin D is involved in regulating innate and adaptive immune functions. Several studies have been done on the association of serum vitamin D levels and the incidence of respiratory tract infections. In the present study it was seen that vitamin D levels were much lower in patients with recurrent RTI than those with RTI.

References

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