

# Association of the Vitamin - D Level with Atopic Dermatitis - A Retrospective Case Control Study

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## **Abstract:**

*Vitamin D has an intense immunomodulatory action on the adaptive immune system and innate immune system; hence it has a great role in the pathogenesis and severity of atopic dermatitis. We studied association of the vitamin D level with atopic dermatitis. The retrospective case control study was conducted at a tertiary care hospital. Retrospective screening of records of atopic dermatitis children and normal (age and sex matched) controls was performed to collect their vitamin-D level during the study period (May 2016 to January 2017). Out of seventy cases of atopic dermatitis of age  $\leq 16$  years, 30 patients were found to be investigated for vitamin-D levels. We collected their vitamin-D levels and compared to the vitamin-D levels of thirty controls who attended outpatient department of pediatrics (without any history of skin or chronic systemic diseases). Vitamin-D level and atopic dermatitis are strongly associated ( $p = 0.002$ , diagnostic odds ratio- 6.41795% C.I 2.084-19.756, sensitivity 73.33% and specificity 70%).*

**Keywords:** - Atopic dermatitis, Vitamin D level, Childhood eczema, Eczema and Vitamin D.

## **Introduction**

Atopic dermatitis is a common dermatological condition affecting children as well as adults and it is having negative impact on their quality of life. Management is taxing and requires an in-depth knowledge and meticulous evaluation of the complications. The exact pathogenesis of atopic dermatitis is not clear. The immune dysfunction plays a pivotal role in causation of atopic dermatitis. Recently, studies have recognized additional influences of vitamin D on the immunity and atopic dermatitis.<sup>1,2,3,4</sup> Birth cohort studies have revealed and confirmed that maternal intake of vitamin D from food during pregnancy was negatively related to the risk of allergic respiratory diseases.<sup>2</sup> It has been shown that infants born to mothers with low vitamin D intake during pregnancy<sup>3,4</sup> have a higher risk of developing atopic dermatitis (AD). Cross-sectional studies have established a greater risk of AD in infants born in winter compared with those born in summer.<sup>5</sup> Moreover there is an influencing effect of latitude on the prevalence of AD in children which decides the intensity of sunlight.<sup>6</sup> A five times increase in the likelihood of AD was found in vitamin D deficiency compared with their vitamin D-replete counterparts.<sup>7</sup>

Sidbury et al<sup>8</sup> inveterate beneficial effects on AD from oral supplementation with vitamin-D.

Another potential benefit of vitamin D is related to its immunomodulatory action on the adaptive immune system

and innate immune system which has a great impact on the pathogenesis, chronicity, severity and relapses of atopic dermatitis.<sup>9-14</sup> So vitamin-D levels estimation is essential in patients with atopic dermatitis since it affects the clinical manifestations of atopic dermatitis.

**Aim** - To study the association of the vitamin D level with atopic dermatitis.

Study period - May 2016 to January 2017

### **Inclusion criteria for cases -**

1. Children with age below or equal to 16 years
2. Who are known cases of atopic dermatitis

### **Exclusion criteria for cases -**

1. Children with other systemic diseases
2. Known case of malnutrition
3. Who had earlier supplementation of vitamin-D
4. Children on phototherapy

## **Methodology**

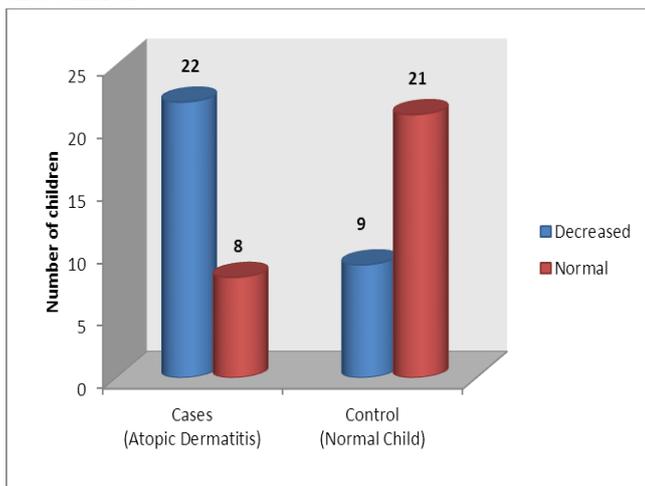
The retrospective observational case control study was conducted at a tertiary care hospital. Retrospective screening of records of atopic dermatitis children and normal (age and sex matched) controls was performed to collect their vitamin-D level during the study period (May 2016 to January 2017). Out of seventy cases of atopic dermatitis of age  $\leq 16$  years, 30 patients were found to be investigated for

vitamin-D levels during the study period. We collected their vitamin-D levels and compared to the vitamin-D levels of thirty controls who attended outpatient department of paediatrics (without any history of skin or chronic systemic diseases). The vitamin-D levels <20 ng/mL, 21-29 ng/mL and >30 ng/mL were considered to be vitamin D deficiency, insufficient and normal respectively.

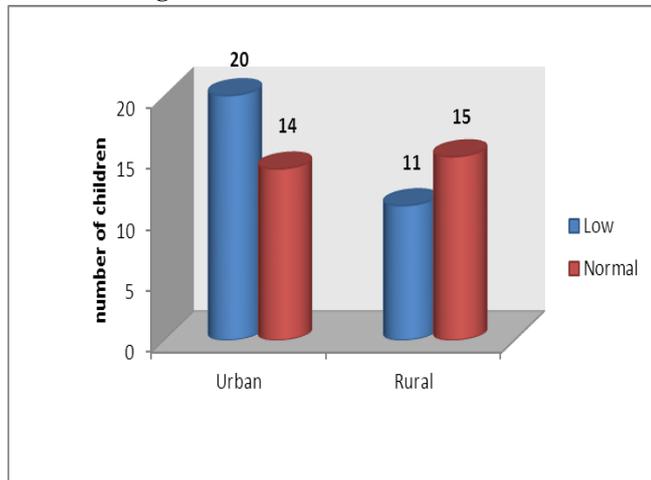
**Results**

There were thirty cases of atopic dermatitis and thirty normal (age and sex matched) controls without atopic dermatitis in the study. Low vitamin D level was found in twenty two patients of the case group and nine patients of the control group. Out of 60 study subjects (30 cases and 30 controls), 34 (56.6%) were males and 26(43.33%) were females. There was a statistically significant association between vitamin-D level and atopic dermatitis (p = 0.002, diagnostic odds ratio- 6.41795% C.I 2.084-19.756, sensitivity 73.33% and sensitivity 70%).

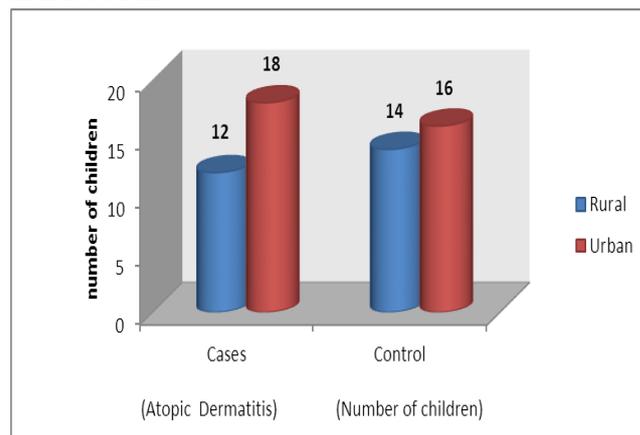
**Table 1: Depicts prevalence of Vitamin-D levels in cases and control.**



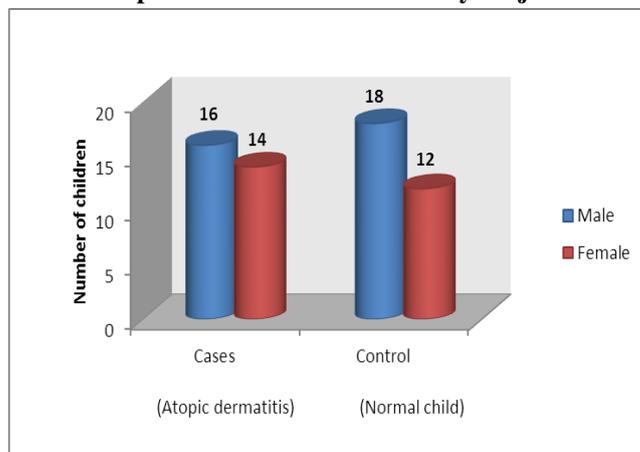
**Table 2: Depicts the overall prevalence of low vitamin – D level among different areas.**



**Table 3: Distribution of the study subjects according their location**



**Table 4: Depicts sex distribution of study subjects.**



**Discussion**

Our study revealed high prevalence of low vitamin D level in atopic dermatitis children. Vitamin-D level and atopic dermatitis are strongly associated (p = 0.002, diagnostic odds ratio- 6.41795% C.I 2.084-19.756, sensitivity 73.33% and sensitivity 70%). It is mandatory to do vitamin-D level in every patient with atopic dermatitis. We suggest that a protocol that has all baseline investigations for atopic dermatitis including vitamin-D level can be made. Furthermore all the patients with low vitamin-D should be treated as low vitamin-D is associated severity of atopic dermatitis.

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