

Vitamin D Deficiency is Associated with Increases IgE Receptors in Children with Asthma

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Abstract : Background: Vitamin D is a potent modulator of the immune system and is involved in regulating cell proliferation and differentiation. Vitamin D deficiency has been linked to increased severity of asthma in children. Asthma has dramatically increased in past decades, particular in developing countries and affects up to 20% of the population. IgE and its receptors, CD23 (FcεRII) and CD 21, play an essential role in all allergic conditions. Methods: A case control study was conducted on asthma and age and sex matched control children. 25 hydroxyvitamin D3 was quantified by HPLC; CD23; and CD21 expression on B cells were performed by flow cytometry. Total Histamine, total IGE and IL-5 and IFN-γ cytokines were determined by ELISA in blood samples of bronchial asthma (n=45) and control children (n=45). Results: The mean ± SE of vitamin D was significantly (p<0.05) low in asthma children (13.6±0.54 ng/mL) than in controls (17.4 ± 0.37 ng/mL). The mean (%) ± SE of CD23 and CD21 expression on B cells were significantly (p<0.01) high in asthma (1.02±0.09; 1.67± 0.13), when compared to controls (0.24±0.01; 0.94±0.03) respectively. The mean± SE of Serum IgE and blood histamine levels in asthma children (354.52 ± 17.33 IU/mL; 53.27 ± 2.54 nM/mL) were increased (P<0.05) when compared to controls (183.12±17.62 IU/mL 39.34±4.16 nM/mL) respectively and IFN-γ (Th1 cytokine) was lower (P<0.01) (16.37±1.27 pg/mL) than in controls (43.34±6.21 pg/mL). Conclusion: Our study provides evidence that low vitamin D levels are associated with increased IgE receptors CD23 and CD21 on B cells. In addition, there was preferential activation of Th2 (IL-5) and suppression of Th1 (IFN-γ) cytokines in children with asthma.

Keywords : bronchial asthma, CD23, IgE, vitamin D

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