Effect of early vitamin D supplementation on asthma and the possible mechanisms

X. Chen1, S.Q. Rao2, B.H. Gao3 and Z.Q. Jiang1

1Department of Nutrition, College of Public Health, Sun Yat-Sen University, Guangzhou, China
2Department of Pediatrics, Liwan Hospital, Guangzhou Medical College, Guangzhou, China
3Department of Children’s Health, Huzhong Hospital, Guangzhou, China

Corresponding author: X. Chen
E-mail: chenxiangsci@163.com

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ABSTRACT. Asthma is a chronic inflammatory disease of the airways with variable airflow obstruction and bronchial hyper-responsiveness. It is believed that Th2-derived cytokines orchestrate the asthmatic response and the maintenance of the balance of Th1/Th2 plays a crucial role in prevention of asthma. Moreover, 1,25(OH)2D3, the biologically active form of vitamin D, was reported with an almost opposite role in prevention and treatment of asthma. Therefore, in this study, we elucidated the evaluations of in vivo anti-asthma effects when treated with different doses of vitamin D and validated the relationship between vitamin D and asthma. Our data demonstrated that intervention with the appropriate dose of 1,25(OH)2D3 in early life could improve pulmonary function and reduce eosinophil cell infiltration in the airways of rat asthma models. However, overdose might play a detrimental effect. Its mechanism may correlate with the effect of 1,25(OH)2D3 on interleukin (IL)-4, IL-12, IL-13, interferon-γ, and ovalbumin-specific immunoglobulin E secretion and the expression of p-JAK1/p-STAT6/SOCS5.

Key words: Vitamin D; Infant; Weaning rats; p-JAK1/p-STAT6/SOCS5