ABSTRACT

MECHANISM OF TYPE-2 INNATE LYMPHOID CELLS AND EPIDERMAL FIBROBLAST GROWTH FACTOR ON CLINICAL IMPROVEMENT IN CHILDHOOD ASTHMA AFTER ZINC SUPPLEMENTATION

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Background: Asthma is a chronic airway inflammation, characterized by variable expiratory airflow limitation. Type-2 innate lymphoid cells (ILC2) have been shown to contribute to airway inflammation and hyperreactivity. Epidermal Growth Factor (EGF) and Fibroblast Growth Factor (FGF) play an important role in airway remodeling of asthma. Zinc as a micronutrient, also has a role in the pathogenesis of asthma.
Objective: to determine the mechanism of ILC2, EGF & FGF on improving childhood asthma after Zinc supplementation.
Methods: A double-blind, placebo-controlled clinical trial over 4 weeks was tested on mild to severe persistent asthma. Children aged 6-15 years randomly received Zinc supplementation (20 mg elemental Zinc /day) or placebo in adjuvant to the standard treatment. The primary outcomes were C-ACT score and FEV_1. The secondary outcomes were the IL-33-activated dendritic cell, IL-5 and IL-13-expressed ILC2s (nuocytes), NF-kB p65 CD117, EGF, FGF, catalase, SOD, and histamine. Data were analyzed by paired t test, independent t test and path analysis.
Results: Twenty three children were enrolled into the study. Both treatment (n=11) and control (n=12) groups had low initial serum Zinc concentrations [5.35 (SD 2.3) µmol/L and 4.06(SD 1.7) µmol/L, respectively]. There was no significant difference in NF-kB p65 and FEV_1 pre and post treatment. The treatment group showed significant improvements in C-ACT, IL-33-activated dendritic cells, IL-5 and IL-13-expressed nuocytes, EGF, FGF, catalase, SOD and histamine. Path analysis revealed no correlation between ILC2s, EGF, FGF and C-ACT and FEV_1.
Conclusion: Zinc supplementation improves ILC2s, EGF, FGF and C-ACT score. C-ACT and FEV1 are unexplicable mechanism of ILC2s and EGF-FGF system pathways.

Keywords: Type-2 Innate Lymphoid Cells, Epidermal Fibroblast Growth Factor, Pediatric Asthma, Zinc