



LETTER TO THE EDITOR

Serum level of thymic stromal lymphopoietin in allergic asthmatic children

KEYWORDS

Allergic asthma;
TSLP;
Children

To the Editor:

Asthma is a complex chronic disease of the lungs clinically characterized by reversible airflow obstruction, enhanced bronchial responsiveness, and airway inflammation [1,2].

Thymic stromal lymphopoietin (TSLP) is an interleukin-7 (IL-7)-like cytokine that has emerged as a key player in the pathogenesis of allergic diseases such as asthma, atopic dermatitis, and allergic rhinitis [3]. TSLP activates the myeloid dendritic cells to induce pro-allergic CD4+ and CD8+ T cell responses; and activates the mast cells to facilitate their cross-talk with structural cells [4]. TSLP has been found to be overexpressed in allergy patients with acute and chronic lesions of atopic dermatitis, as well as in the bronchi of asthmatic patients [1,2]. Interestingly, the level of TSLP in serum has been shown to correlate with the severity of the disease [3] in adult asthmatic patients however, it is not known whether it is the case in children. In this study, we investigated serum TSLP level in allergic asthmatic, allergic non asthmatic, and non allergic asthmatic pediatric samples compared to healthy control children.

This study was approved by the Ethics Committee of the Faculty of Medicine at the University of Manitoba. Blood was collected into sterile heparin tubes from the peripheral vein of allergic asthmatic, non allergic asthmatic, allergic non asthmatic and healthy children (ages 10–11 years). Clinical assessment for asthma was performed by a pediatric allergist (A. B.) and was based on the Canadian Asthma Consensus Guidelines in which symptoms and variable airway obstruction were two major criteria [5]. To confirm the asthma diagnosis, pediatric allergists conducted a physical examination for chest symptoms (hyperinflation, wheeze, prolonged expiration and decreased breath sounds) and a standardized history, including questions on cough, wheeze, shortness of breath, response to current medications (i.e. bronchodilators, corticosteroids), and the presence of other allergic conditions (e.g. allergic rhinitis, atopic dermatitis and food allergies). Children with a positive

skin prick test to at least one allergen (i.e., tree pollen, weed pollen, ragweed, grass pollen, *Alternaria*, *Cladosporium*, *Penicillium*, house dust mites *Dermatophagoides pteronyssinus* and *Dermatophagoides farinae*, cockroach, cat, dog, feathers, and peanut) were labeled allergic. Asthma and allergy were combined into a four-category variable of allergic asthmatic, non allergic asthmatic, allergic–non asthmatic, and healthy control (no allergy or asthma). Atopic dermatitis and allergic rhinitis were diagnosed by the pediatric allergist based on history and physical examination. Food allergy was based on parental report.

Immuno-reactive TSLP within the serum was quantified using ELISA with matched Abs according to basic laboratory protocol provided by the manufacturer (R&D Systems, Minneapolis, MN). The sensitivity limit of TSLP assay is 7.8 pg/ml [6]. Results are expressed as means $\pm$ SEM. Differences between the groups were analyzed using Kruskal Wallis with Dunne test. Differences between pairs were assessed by Mann Whitney *U* test using GraphPad Prism v4.0. software. *P* values <0.05 were considered statistically significant.

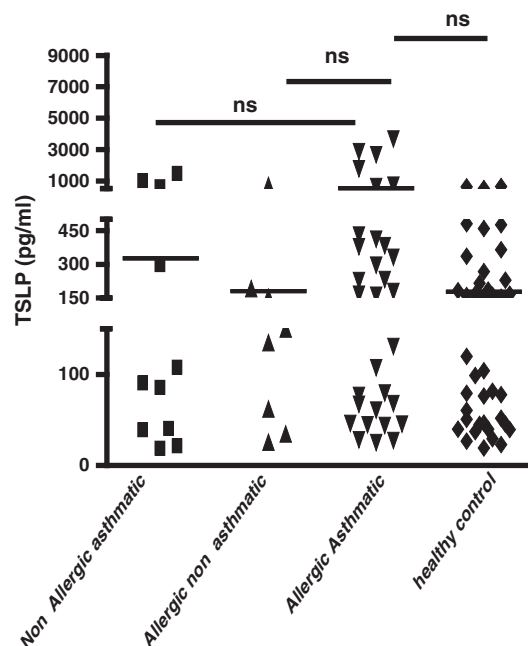


Figure 1 Serum TSLP levels in the four groups of pediatric subjects. TSLP was measured using ELISA.

Table 1 Clinical characteristics of the children. All children are between the ages of 10–11 years. FEV1; forced expiratory volume in 1 s, FEV1% Pred; percentage of predicted, PC20; provocative concentration causing a 20% fall in FEV1, FVC; forced vital capacity.

	Non allergic asthmatic	Allergic non asthmatic	Allergic asthmatic	Healthy control
Number of patients	13	16	35	49
FEV1 Pred	85.2±12.3	91.2±6.84	89.6±11	89.6±12.9
FEV1 Abs	1.53±0.275	1.77±0.221	1.64±0.265	1.73±0.37
PC20	5.83±14.59	4.42±4.85	7.34±14.4	10.91±16.12
FVCL Pred	93.8±11.5	99.7±11.8	99.9±12.1	98.8±13.8
CRP (mg/dl)	493.17±447.57	3237.91±5854.16	1833.36±3734.61	1607.71±2673.38
Adiponectin (ng/ml)	10.90±4.921	12.59±3.63	8.54±3.893	10.53±5.85
Leptin (ng/ml)	5.47±4.31	12.97±14.32	10.866±9.90	8.418±10.73

As can be seen in Fig. 1, TSLP serum levels were not significantly increased in allergic asthmatic compared to allergic non asthmatic, non allergic asthmatic or healthy control children ($P>0.05$).

We then investigated whether a correlation exists between serum TSLP levels and clinical parameters of asthma. Interestingly, there was no significant correlation between serum TSLP level and FEV1 Abs or Pred, PC20, FVCL Pred tests in non allergic asthmatic, allergic non asthmatic, allergic asthmatic, or healthy control children (Table 1, data not shown). Furthermore, number of allergies in allergic asthmatic children did not correlate with serum TSLP levels (data not shown). Similarly, no correlation was observed between serum TSLP level and a marker of inflammation such as serum CRP level, or leptin and adiponectin (Table 1 and data not shown). Taken together, our data suggests that serum TSLP level does not reflect allergic or asthmatic disease status in children. One possibility that may account for our data obtained in children is that recent data suggest that TSLP exerts direct antimicrobial activities *in vitro* [8], or indirectly via the induction of extracellular traps [7] indicating an important role of this pathway in innate immune defense.

Conflict of interest statement

The authors declare that there are no conflicts of interest.

Acknowledgments

This work was supported by grants from the Canadian Institutes of Health Research (MOP: 53104) to ASG and AB. ASG is supported by a Manitoba Research Chair from the Manitoba Health Research Council.

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25 July 2012