

MEETING ABSTRACT

Open Access

Mechanisms of asthma and allergic disease – 1071. Chemokines from cord blood mononuclear cells and the development of eczema or wheeze at 2 years of age in infants at high risk for atopy

Phaik Ling Quah^{1*}, Chiung-Hui Huang¹, Lynette, Pei Shi Shek¹, Marion Aw¹, Bee Wah Lee², I-Chun Kuo¹

From 2nd WAO International Scientific Conference (WISC 2012)
Hyderabad, India. 6-9 December 2012

Background

Innate chemokines secreted from cord blood mononuclear cells (CBMCs) offer novel tools to investigate the influence of immune deviation at birth to the development of eczema or wheeze by 2 years of age.

Methods

Cord blood samples were collected from 161 subjects from a birth cohort of 253 subjects participating in a double-blind placebo randomized trial on probiotic supplementation (*Lactobacillus rhamnosus* GG and *Bifidobacterium longum*, birth to 6 months). Clinical symptoms for eczema and wheeze were followed up to 2 years of age. The chemokine production in culture supernatants from CBMCs stimulated with 1 µg/mL of lipopolysaccharides (LPS) for 24 hours was measured using the Milliplex assay. Chemokine levels were analyzed by the Mann-Whitney *U*-Test and the association of chemokines with clinical outcomes was analyzed by the multivariable logistic regression.

Results

Our results showed that subjects with eczema ($n = 36$) had significantly reduced production of CXCL5 (epithelial neutrophil-activating protein 78 (ENA78)) from CBMCs as compared to healthy control subjects ($n = 94$) from the LPS stimulated cells ($p = 0.001$). CCL20 (macrophage inflammatory protein-3α) levels were significantly lower in the subjects who developed wheeze ($n = 35$) as compared to healthy controls ($n = 94$) from the LPS stimulated cells ($p = 0.001$). There was no difference in CXCL5 and

CCL20 production from the cultured unstimulated cells. Diminished CXCL5 production by LPS stimulated CBMCs was found to be independently associated with eczema (adjusted OR, 0.275; 95% CI, 0.134-0.562, $p = 0.001$) after adjusting for allergen sensitization, paternal eczema and sibling eczema using multivariable logistic regression. Similarly, suppressed production of LPS stimulated CCL20 was an independent risk factor associated to the development of wheeze (adjusted OR, 0.308; 95% CI, 0.133-0.716, $p = 0.06$) after adjustment for maternal asthma, sibling eczema, birth height and birth weight.

Conclusions

We observed the diminished production of CXCL5 and CCL20 by CBMCs from subjects who develop eczema and wheeze respectively within 2 years of age. This association may reflect a deviated innate immune response to microbial or viral infections which might have an impact on the susceptibility of childhood eczema and wheeze.

Author details

¹Paediatrics, National University of Singapore, Singapore, Singapore. ²The Child & Allergy Clinic, Singapore.

Published: 23 April 2013

doi:10.1186/1939-4551-6-S1-P68

Cite this article as: Quah et al.: Mechanisms of asthma and allergic disease – 1071. Chemokines from cord blood mononuclear cells and the development of eczema or wheeze at 2 years of age in infants at high risk for atopy. *World Allergy Organization Journal* 2013 **6**(Suppl 1):P68.

¹Paediatrics, National University of Singapore, Singapore, Singapore
Full list of author information is available at the end of the article