DNA Microarray Analysis of the Effect on Inflammation in Patients Treated with Acupuncture for Allergic Rhinitis

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Abstract

Background: Allergic rhinitis affects approximately 30% of adults and up to 40% of children in industrialized societies. Medicines available for relief of allergic rhinitis symptoms include antihistamines, decongestants, leukotriene inhibitors, topical hormones, and corticosteroids. However, the negative side-effects of antiallergic medicines cause many patients with allergic rhinitis to choose traditional Chinese medical treatments, such as taking Chinese herbs or treatment with acupuncture.

Objectives: This study assessed the effect of acupuncture for treatment of allergic rhinitis.

Methods: Eighteen (18) patients with allergic rhinitis were treated with acupuncture 8 times over a 4-week period, and peripheral blood of these patients was collected at each visit for analysis of gene expression via cDNA microarray. To estimate the therapeutic effect of acupuncture objectively, patients completed the rhinoconjunctivitis quality of life questionnaire (RQLQ) before and after acupuncture therapy.

Results: Based upon patients’ response to the RQLQ, acupuncture therapy significantly reduced allergic rhinitis symptoms, including nasal symptoms, non–hay fever symptoms, and sleep and practical problems (associated with daily activities). In addition, expression of interleukin-1 receptor-a (IL1R1) in peripheral blood was significantly decreased at 2 hours, 24 hours, and 4 weeks after acupuncture treatment in these patients.

Conclusions: To our knowledge, this is the first report of cDNA microarray analysis of differential gene expression in the peripheral blood of patients with allergic rhinitis before and after acupuncture treatment. Our data suggest that the balance between T-helper 1 and T-helper 2 cell-derived proinflammatory versus anti-inflammatory cytokines might be improved by acupuncture treatment.

Introduction

Allergic rhinitis is characterized by 1 or more symptoms including: sneezing; itching; nasal congestion; and rhinorrhea, which affect approximately 30% of adults and up to 40% of children in industrialized societies.1 Allergic rhinitis is usually accompanied by other allergic conditions, such as atopic dermatitis and urticaria. In addition, both asthma and allergic rhinitis frequently affect the same person, as reported by the World Health Organization “Allergic Rhinitis and Its Impact on Asthma” guidelines; leading to the previously proposed theory of “one airway, one disease.”2,3 Similarly, Traditional Chinese Medicine follows a theory that “the nose is the opening for the lungs,” which highlights the close clinical correlation between nose and lung diseases. Therefore, allergic rhinitis is considered to be an important public-health economic burden because of its prevalence and effect on the quality of life of these patients, although it is not a life-threatening condition.4 Currently, medicines available for relief of allergic rhinitis symptoms include antihistamines, decongestants, leukotriene inhibitors, topical hormones, and corticosteroids.1 However, antiallergic medicines’ undesirable side-effects, such as drowsiness or fatigue from antihistamines,5,6 and the fact that inhaled corticosteroids may reduce the growth of children with asthma,7,8 drive many patients with allergic rhinitis to choose comple-

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