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Associations of Building Characteristics and Lifestyle Behaviors with Allergic Disease for Adults in Shanghai: from a Cross-sectional Survey

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Abstract

Few studies have illustrated the effects of residential environmental conditions on prevalence of allergic disease for adults. A cross-sectional study with 17898 valid samples from parents of preschool children was carried out during 2010-2011 in Shanghai, China. The allergic symptoms of these participants were surveyed; meanwhile the building characteristics, environmental exposures and lifestyle behaviors were all reported by the questionnaires. Pearson's Chi-square (χ^2), Gamma correlation analysis and logistic regression analysis were applied to investigate associations between building characteristics, lifestyle and their allergic symptoms. The results displayed that interior renovation or adding new furniture, home dampness-related indicators and the residential distance within 200 meters of the traffic trunk or highway, using incense and so on were the significant risk factors for allergic symptoms ($p < 0.05$, $AOR > 1$), while exposing the bedding to sunshine is a protective factor, so we can draw that controlling indoor air pollution and the residential dampness-related indicators, as well as changing the bad habits are the effective measures to prevent allergic symptoms.

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1. INTRODUCTION

Allergic diseases (such as asthma, nasal or eye allergy, eczema, etc.) are common clinical diseases with high incidence. According to the related literatures, there are about 300 million asthma patients now all over the world [1,2]. The trend of asthma prevalence is rising in the worldwide [3~9]. Many studies about allergic diseases have been published in domestic and overseas, especially for children [4,10~18]. The International Study of Asthma and Allergies in Childhood (ISAAC) have done some related studies in the 1990s and got some results [19]. Allergic disease has become a serious challenge that we cannot ignore. These allergic diseases are highly associated with hereditary. Therefore, the study on the association of dwelling characteristics, and lifestyle behaviors with allergic diseases to explore the unknown allergens and the possible allergenic factors in the indoor environment is necessary and critical. It provides a scientific basis for the prevention and treatment of allergic diseases. This article aims to study the associations of dwelling characteristics and lifestyle behaviors with allergic diseases of residents in Shanghai.

2. METHODS

2.1. Cross-sectional survey

This study is part of the study of the China, Child, Homes, Health (CCHH) study in Shanghai. We obtained some important information of the research subjects, such as the health, dwelling characteristics, lifestyle behaviours and so on by the questionnaires and analysed the relationship between these environmental factors and the allergic diseases of residents.

2.2. Research subjects

We selected five districts in Shanghai (Urban: Hong-Kou, Jing-An, and Zha-Bei; Suburban: Bao-Shan and Feng-Xian) as the research object, and about 15 kindergartens were randomly chosen in each district. We surveyed 17,898 parents or guardians of 1-8 year-old children in 72 kindergartens and chosen 13,335 questionnaires of 4-6 year-old children which were preschool children and accounted for a larger proportion. The research subjects of this paper were children's parents.

2.3. Questionnaires

The questions about allergic diseases in the questionnaires of this study were cited from the diseases study of office building in Swedish office buildings, and those about building characteristics were similar to the questions in Dampness in Building and Health (DBH) study. In addition, we modified questions about Building characteristics according to the lifestyle of Shanghai residents. Symptoms of the allergic disease involved in this survey included asthma, irritation of nose or eyes and eczema. In this study, the factors that may be associated with allergic diseases were divided into three kinds and respectively were building characteristics, environmental exposures and lifestyle behaviors of residents.

2.4. Statistical analysis

Data were analyzed by SPSS (Version 19.0, SPSS Ltd., USA). Frequency statistics, crosstab and Pearson chi-square test were used to count the incidence or prevalence of symptoms and the difference between different dwelling characteristics, environmental exposure and lifestyle behaviors. P-value<0.05 indicated significance in all statistics analysis. Multiple logistic regression models were applied to reveal relationships between different factors and symptoms occurring, and confidence intervals (CI) are 95%.

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