



The first 2-year home environment in relation to the new onset and remission of asthmatic and allergic symptoms in 4246 preschool children



Zhijun Lin^a, Dan Norback^b, Tingting Wang^c, Xin Zhang^d, Jingjin Shi^a, Haidong Kan^a, Zhuohui Zhao^{a,*}

^a Department of Environmental Health, School of Public Health, Key Laboratory of Public Health Safety, Ministry of Education, Fudan University, Shanghai 200032, PR China

^b Department of Medical Sciences, Occupational and Environmental Medicine, Uppsala University, Uppsala SE-751, Sweden

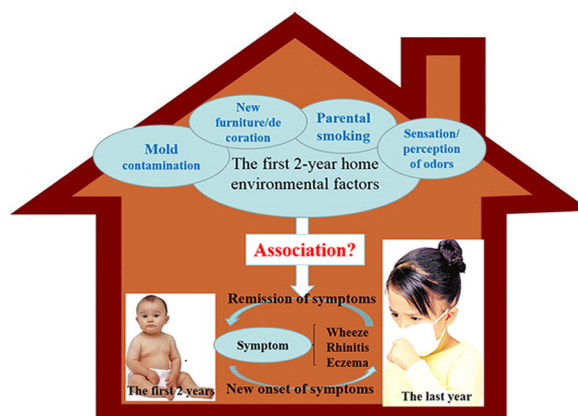
^c Department of Maternal, Child and Adolescent Health, School of Public Health, Xinjiang Medical University, Urumqi 830011, PR China

^d Institute of Environmental Science, Shanxi University, Taiyuan 030006, PR China

HIGHLIGHTS

- Data on early home environment and health were collected in 4246 Chinese children.
- Early home mold/chemical pollution was positively associated with the new onset of allergic symptoms.
- Early home mold/chemical pollution was negatively related with the remission of allergic symptoms.
- Early home environment was significant for the development of children's allergic symptoms.

GRAPHICAL ABSTRACT



ARTICLE INFO

Article history:

Received 8 December 2015

Received in revised form 5 February 2016

Accepted 6 February 2016

Available online xxxx

Editor: D. Barcelo

Keywords:

Asthma
Early
Indoor environment
Onset
Remission

ABSTRACT

The home environment can influence childhood allergies and respiratory health but there is little information on associations between early life exposure at home and new onset and remission of the asthmatic or allergic symptoms in preschool children. A questionnaire survey was performed in a random cluster sample of 4246 preschool children in Urumqi, China. Information on the home environment (perceptions of odors and indicators of pollution sources) and children's health (wheeze, rhinitis and eczema) was collected for the first 2 years of life and the last year (before answering the questionnaire) from one of the parents or another guardian of the child. Associations between the home environment the first 2 years of life and new onset and remission of childhood symptoms were analyzed by multiple logistic regression. Home environment factors reported for the first 2 years of life were consistently positively associated with new onset of symptoms and negatively associated with remission of symptoms. Visible mold (OR 1.46, 95% CI 1.12–1.90), moldy odor (OR 2.15, 95% CI 1.45–3.18), air dryness (OR 1.31, 95% CI 1.08–1.59), stuffy odor (OR 1.25, 95% CI 1.01–1.54) and parental smoking (OR 1.36, 95% CI 1.13–1.65) were associated with new onset of symptoms. These factors were negatively associated with the remission of symptoms. In conclusion, mold contamination at home (moldy odor/visible mold), poor indoor air quality (stuffy odor, air dryness) and exposure to environmental tobacco smoke (ETS) in the first 2 years of life

* Corresponding author.

E-mail address: zhzhao@fudan.edu.cn (Z. Zhao).

can increase the incidence of asthmatic and allergic symptoms and decrease the remission from these symptoms in preschool children.

© 2016 Published by Elsevier B.V.

1. Introduction

The prevalence of childhood asthma has increased in the Asia-Pacific area, including China (Asher et al., 2006; The International Study of Asthma and Allergies in Childhood (ISAAC) Steering Committee, 1998). Childhood asthma is often accompanied by concomitant allergic rhinitis and eczema and these diseases are often related to allergic sensitization. The priming of the immune system can occur in early life (van der Velden et al., 2001) or before birth (Jones et al., 2000; Warner et al., 2000) which makes the prenatal period or the first 2 years of life a critical time window for health impairments due to environmental exposure (Dietrt et al., 2008; van Odijk et al., 2003). The significance of early life exposure, especially the first 2 years of life, is an important issue from a public health point and there is a possibility for primary prevention with respect to asthma, rhinitis and eczema if the early life environment can be improved.

The home is the indoor environment where children spend most of their time. In China, the residential indoor environment has experienced rapid and dramatic changes over the last two decades. Nowadays, buildings are more tightly constructed and consequently have less air exchange. New furniture is more common, indoor tobacco smoking is common and air conditioners are more commonly used (China Statistical Yearbook, 2011; Zhang et al., 2013). Due on this rapid change of the home environment, the early life exposure panorama has changed and younger children may have more exposure to certain types of indoor factors. Since the home environment is important for children's respiratory health (Baker et al., 2007; WHO, 2009), there is a need for more studies from China investigating the health effects environmental exposure at home during the prenatal period (exposure during pregnancy) as well as the first 2 years of life.

The overall hypothesis of this study is that the rapid increase of childhood asthmatic and allergic symptoms in Chinese cities can be partly due to the changes in the residential indoor environment, and in particular that the early home environment might influence the new onset and remission of childhood asthma and allergic symptoms in preschool children. In order to test on this hypothesis, a large-scale epidemiology survey in preschool children in Urumqi, north-west of China, was performed. Urumqi is a city with a rapid economic development during the last decade. The average annual growth rate of GDP in this city from 2001 to 2010 was 10.3% (Statistics Bureau of Xinjiang Uygur Autonomous Region, 2011). In this study, information on the home environment and children's asthmatic and allergic symptoms during the first 2 years of life and the last year of life was collected. The aim was to study associations between indoor factors in the home during the first 2 years of life and new onset and remission of children's asthmatic/allergic symptoms. Incidence and remission was calculated by comparing symptoms in the first 2 years of life with symptoms the last year. Mutually adjusted multiple logistic regression analyses were applied including home environment factors and demographic characteristics.

2. Material and methods

2.1. Ethic statements

The study was approved by the Ethical Committee of School of Public Health, Fudan University, China. Informed written consents were obtained from all participating children's parents and guardians before the survey.

2.2. Subjects

The study was performed in Urumqi, China, from November to December 2011. Details on the study design and selection of participants have been reported in our previous publication (Wang et al., 2013). Briefly, 7 administrative areas, including Xinshi, Tianshan, Toutunhe, Sayibak, Midong, Shuimogou and Urumqi County, were arbitrarily selected without any previous information on the children's health conditions and their home environment. In total, 5650 children (1–8 years) from 18 day care centers participated in the questionnaire survey. The questionnaire was answered by children's parents or guardians and returned within one week. Finally, 4618 subjects returned the complete questionnaires with 2.3% ($n = 100$) of children aged <3 yrs, 24.3% ($n = 1055$) aged ≥ 3 –4 yrs, 36.0% ($n = 1564$) aged ≥ 4 –5 yrs, 30.4% ($n = 1321$) aged ≥ 5 –6 yrs and 7.0% ($n = 306$) aged ≥ 6 yrs. Considering the definitions on new onset and remission of symptoms, children below 3 yrs of age were excluded, leaving 4246 children aged ≥ 3 yrs ($n = 4246$) to be included in this study.

2.3. Questionnaire

The questionnaire contained questions on demographic information, children's health outcomes and the home environment in the first 2 years as well as the health outcomes and the home environment in the last year (12 months before answering the questionnaire).

Demographic information included children's birth date, sex, ethnicity (Han nationality vs. not-Han nationality), breastfeeding (>6 months vs. ≤ 6 months), parental asthma/allergic diseases (PAA) (if the child's mother or father ever had asthma, allergic rhinitis or eczema symptom) and the location of the current dwelling (urban vs. suburban/rural).

2.3.1. Health outcomes

The health outcomes were based on the core questionnaire from the ISAAC study (Asher et al., 1995), which have been validated by clinical investigation in Chinese children (Chan et al., 2001). This study focused on wheeze, rhinitis and eczema symptom. In detail, they were asked on (1) wheeze symptom, whether the children had wheezing or whistling in the chest? (yes/no); (2) rhinitis symptom, whether the children had a problem with sneezing, or a runny, or a blocked nose when he/she did not have a cold or the flu? (yes/no); (3) eczema symptom, whether the children had eczema? (yes/no). All these questions were asked for the first 2 years (one set of questions) and for the last year (12 months before answering the questionnaire).

By comparing symptoms in the first 2 years and in the last year, new onset of a specific symptom was calculated as the presence of the symptom in the last year but absent during the first 2 years of life. The variable 'any onset' was calculated as onset of at least one the 3 symptoms (wheeze, rhinitis and eczema). The remission of a specific symptom was defined as presence of the symptom during the first 2 years of life but absence of the symptom in the last year. The variable 'complete remission' was defined as having at least one of the 3 symptoms (wheeze, rhinitis and eczema) in the first 2 years of life but having none of the symptoms in the last year.

2.3.2. Home environment assessment

The questions on the home environment were the same as in previous studies in this area of China (Lin et al., 2015; Wang et al., 2013) and in studies from other areas in the world (Bornehag et al., 2004; Hsu et al., 2012; Naydenov et al., 2008; Tham et al., 2007; Sun et al., 2009, 2011) but was slightly adapted to fit with local lifestyle and habits in

Download English Version:

<https://daneshyari.com/en/article/6322263>

Download Persian Version:

<https://daneshyari.com/article/6322263>

[Daneshyari.com](https://daneshyari.com)