

Prevention and treatment of childhood asthma in China

Yu-Zhi Chen

Beijing, China

Asthma, one of the most common chronic diseases in children, has become a serious global health problem that is of great concern among medical and health professionals. About one third to half of cases of moderate to severe childhood asthma may persist to adulthood. The prevalence rate of allergic diseases (mainly asthma and allergic rhinitis) remains 10% or higher in many industrialized countries. It is reported that the wheezing and asthma prevalence rate in the last 12 months in the USA, UK, Australia and New Zealand is between 10% and 30%, but it is not optimistic in China.^[1] The National Cooperative Research Group on the Management of Childhood Asthma, a subdivision of the Division of the Respiratory Diseases of the Chinese Medical Association, conducted a nationwide epidemiological survey by randomized sampling of asthma among 0-14 years old children during the period of 1988-1990. The 2-year prevalence rate of childhood asthma at that time was 0.11% - 2.03%.^[2] The second identical epidemiological survey was conducted during 1998-2000. The 2-year asthma prevalence rate of 0-14 years old urban children in this survey ranged from 0.11% to 3.34% (average 1.54%) and the accumulative asthma prevalence rate was 0.25% - 4.63% (average 1.97%).^[3] In China, there is a vast disparity in topography, population density, and living environment, which are closely related to the divergence of asthma prevalence in children. The prevalence in high altitude areas with a low population such as Tibet and Qinghai is noticeably lower than in cities in the low altitude areas, whereas that in cities with a very dense population like Chongqing and Shanghai, is the highest with an accumulative prevalence rate of 4.63% and 4.52% respectively. In Bei-

jing, the prevalence rate of childhood asthma increased 1.6-fold from 0.78% to 2.06% during the period of 1990-2000. A comparison of the 1998-2000 survey and the 1988-1990 survey showed an increase of asthma prevalence in urban children, which is consistent with the global increase of the prevalence. There was an increasing asthma prevalence in all ages except for the under-3-year group and it was significantly increased in the 7-14 years group. The incidence rate of asthma exacerbation triggered by respiratory infection and allergen sensitization was 94.62%. Thus 95.4% of the family members were affected because of asthma in their children. In addition, the surveys revealed that only 2/3 of asthmatic infants or children had been precisely diagnosed. About 16.0% of the children had never been diagnosed as having asthma in their outpatient visits, and 50% were not confirmed to have asthma until 3 years after onset of the disease. Therefore, early diagnosis and appropriate treatment of childhood asthma are still major challenges to medical and health professionals in China.^[4]

In 1995, the World Health Organization (WHO) and the National Heart, Lung and Blood Institute (NHLBI) of the USA collaborated in convening expertise workshops and developed a comprehensive report, i. e. global strategy for asthma management and prevention, which was published as the *Global Initiative For Asthma (GINA)*, providing information, recommendations and tools for medical professionals and public health officials for designing and delivering programs on asthma management and prevention in all countries.^[5] This has been well appreciated by the medical professionals in China. In 1992, 1997 and 2003, we successively worked out the first, second and third editions of the *Guidelines for Asthma Management and Prevention for Adults*. Likewise, the first and second editions of the *Guidelines of Asthma Management and Prevention for Infants and Children* were respectively published in 1993^[6] and 1998^[7], followed by a third revised edition in 2003^[8]. In this edition, we, on the basis of our national conditions, absorbed the essence of GINA material and revised the guidelines, especially in the part concerning the diagnostic criteria of asthma

Author Affiliations: Center for Asthma Prevention, Capital Institute of Pediatrics, Beijing 100020, China (Chen YZ)

Corresponding Author: Yu-Zhi Chen, MD, Center for Asthma Prevention, Capital Institute of Pediatrics, Beijing 100020, China (Tel: 86-10-85634298; Fax: 86-10-85235323; Email: chenyzh@publica.bj.cninfo.net; acebc@public3.bta.net.cn)

© 2005, World J Pediatr. All rights reserved.

in infants and young toddlers. Some infants and young children demonstrate recurrent or persistent cough, and some produce wheezing at the time of lower respiratory infection. These patients are often misdiagnosed as having acute respiratory infection (ARI), bronchitis or pneumonia, which have no response to antibiotics. Administration of anti-asthmatic agents is usually beneficial and may sometimes clarify the diagnosis. If an infant has a recurrent cold that later develops symptoms of the lower respiratory tract lasting for more than ten days and the symptoms are improved after administration of anti-asthmatic agents, a diagnosis of asthma can be established.^[9] Yet if such patients do not respond satisfactorily to anti-asthmatic medications, diseases like foreign body in the bronchus, bronchial lymph node tuberculosis, congenital anomaly of the airway or cardiogenic asthma which may give rise to symptoms such as wheezing, dyspnea or chest tightness must be considered.

For asthma treatment, inhalation of corticosteroids has remained the mainstay of therapy for asthma control. It is considered as the most effective drug for long-term pharmacotherapeutic management of asthma. It can reduce the frequency, length and severity of asthma exacerbations. In the management of moderate to severe asthma, a combined inhalation of corticosteroids and long-term β_2 agonist may result in as good an effect as doubling the dose of corticosteroid alone. As a matter of fact, it may reduce the adverse effect of inhaled steroids, improve the child's medicinal compliance and reduce the family's economic burden. The initial dose of corticosteroids should be dependent on the severity of the disease. If a larger dose of glucocorticosteroids is selected initially, it should be rapidly reduced within 2 to 3 months to the least amount for effective asthma exacerbation control and serve as the lowest maintenance dose. During the stepwise asthma treatment, the therapeutic regimen must be re-evaluated every 1 to 3 months. Once the symptoms of the patient are well controlled, the dose should be maintained at least for another 3 months until the disease is well controlled. Then the dose can be gradually reduced to the smallest for significant control of asthma. Treatment is necessary if the disease is not controlled. Before this, however, the therapeutic regimen should be re-evaluated to avoid any allergens triggering the exacerbation. In addition, attention must be paid to the coexistence of allergic rhinitis or nasal sinusitis. It has been reported that about 75% of asthmatic patients have rhinitis. Being pathognomonic to allergic diseases, both rhinitis and asthma occur in the same respiratory tract; the former may be likely neglected in asthmatic children.^[10] Glucocorticosteroid inhalation is recommended at least for one year for the asymptomatic stage of mild persis-

tent asthma, and 2 to 3 years for moderate and severe asthma after being controlled. As for the use of immunotherapy, both imported and domestic desensitization vaccines are available in China. The effect of desensitization therapy for allergic rhinitis has been well defined, but care must be taken in immunotherapy for hard-to-control asthmatic patients. The precise indications and efficacy of this treatment await further clinical trial.

Education of both medical professionals and patients is of utmost importance in the management of asthma. By the end of 2001, about 25 thousand medical professionals have received GINA education, with special emphasis on the training of clinical nurses and community-based nurses. Moreover, more than 160 organizations providing doctor-patient communication such as Asthma Club, Asthma School and Asthma Family are established in 50 cities of China. About 140 thousand asthma patients participate regularly in the activities of these organizations. The activities in Shanghai and Beijing, for instance, resulted in an asthma control rate of 80%-95% in 2000, a reduced medical cost of 25%-35% in 1995, and an increased corticosteroid inhalation from 11% in 1996 to 21% in 2000.^[11] In addition, the rates for emergency treatment and missing of classes or work was reduced.

Despite these achievements, the management and prevention of asthma is still far from the standards of WHO.^[5] In China, there are about 2.5 million patients with asthma, including 10 million children. A recent study on the asthma status of the Asian Pacific region (ARIAP) revealed that among 405 patients with asthma in Shanghai, Beijing and Guangzhou, asthma control was not very satisfactory. About 3% of the patients had had emergency calls, 1% had been hospitalized, and 25% had schooling or work missed, and 42% of the patients had never taken a pulmonary function test. In contrast to big cities, the situation of asthma prevention and treatment was worse in the grassroots in China. It was estimated that only 2% of asthmatic patients in China received standardized treatment.^[12]

Hence it is necessary to enforce asthma management and education nationwide. In 2002, a research project on "early diagnosis and standardized treatment of childhood asthma" was selected as one of the 100 programs in a 10-year-campaign sponsored by the Ministry of Health, China, for the dissemination of appropriate technologies to the rural areas. In fact, the project has promoted the community-based prevention and treatment of asthma.^[13]

More recently, Noreen Clark of the College of Public Health of Michigan University has advocated the importance of asthma prevention and treatment of 6 to 12-year-old children in schools and community-socie-

ties.^[14] This has widened the vision for asthma prevention and management in children.

Attention should also be paid to the importance of collaboration of asthma clinics with other clinics including those of pulmonary diseases, allergy and ear, nose and throat for the purpose of co-management of asthma, allergic rhinitis and nasal sinusitis. Incidentally this may also improve the condition of hard-to-control asthma cases.

An international collaborative study on asthma and allergic diseases has revealed a great discrepancy in asthma prevalence between the mainland of China, Hong Kong, and south-east Asia, and likewise between the urban and rural areas of the mainland of China. Hence, mutual communications and collaborations between the mainland of China, Hong Kong, Taiwan and Amoy are highly recommended.

The challenge of exploring the causes of the increasing prevalence of asthma lies in extensive research into the risk factors triggering asthma, while focusing on the changing state of industrial pollution, life styles, dietary habits, etc.

Finally, it is highly recommended for specialists in the field of asthma and respiratory diseases, doctors or pediatricians, to take prompt actions to disseminate relevant knowledge to the public and to promote better control of asthma in children.

Funding: None.

Ethical approval: This study was approved by the institutional committee for medical research ethics.

Competing interest: No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

Contributors: CYZ wrote the first draft of this paper, contributed to the intellectual content and approved the final version. CYZ is the guarantor.

References

1 The International Study of Asthma and Allergies in Childhood (ISAAC) Steering Committee. Worldwide variations in the prevalence of asthma and symptoms; the International Study of

- Asthma and Allergies in Children (ISAAC). *Eur Respir J* 1998;12:315-335.
- 2 The National Cooperative Research Group on Childhood Asthma. A nationwide survey on the state of asthma in a population of 900 0-14-year-old children. *Chin J Tuberc Respir Dis* 1993; 16(Suppl on Asthma):64-68.
- 3 National Cooperation Group on Childhood Asthma. A nationwide survey in China on prevalence of asthma in urban children. *Chin J Pediatr* 2003;41:123-127.
- 4 National Cooperation Group on Childhood Asthma. Comparative analysis of the state of asthma prevalence in children from two nationwide surveys in 1990 and 2000. *Chin J Tuberc Respir Dis* 2004;27:112-116.
- 5 National Institutes of Health (NIH). Global Initiative for Asthma. Guide for asthma management and prevention in children. National Heart, Lung and Blood Institute, 2002; NIH Publication No. 02-3659.
- 6 Chen YZ, Hua YH, Wen ZM. Conventional approach to the prevention and treatment of childhood asthma. *Chin J Respir Dis* 1993;31:222-223.
- 7 China National Cooperative Research Group on Children Asthma. Conventional approach to the prevention and treatment of childhood asthma. *Chin J Respir Dis* 1998;36:747-750.
- 8 China National Cooperative Research Group on Children Asthma. Conventional approach to the prevention and treatment of childhood asthma. *Chin J Respir Dis* 2004;42:83-86.
- 9 Cao L, Chen YZ. Treatment of infant asthma with inhaled beclomethasone dipropionate. *Chin J Pract Pediatr* 2000; 15: 604.
- 10 Bousquet J, Van Cauwenberge P, Khaltaev N; Aria Workshop Group; World Health Organization. Allergic rhinitis and its impact on asthma. *J Allergy Clin Immunol* 2001;108(5 Suppl):S147-159.
- 11 He QY, Liu BK, Shuang M, Zhao DH, Qing C, Zhao HH, et al. Education in asthmatic patient management. *Chin J Intern Med* 1997;35:789.
- 12 Rabe KF, Adachi M, Lai CK, Soriano JB, Vermeire PA, Weiss KB, et al. Worldwide severity and control of asthma in children and adults: the global asthma insights and reality surveys. *J Allergy Clin Immunol* 2004;114:40-47.
- 13 Chen YZ. *Diagnosis and treatment of childhood asthma*. Beijing: People's Medical Publishing House, 2004.
- 14 Clark NM, Brown R, Joseph CL, Anderson EW, Liu M, Valerio MA. Effects of a comprehensive school-based asthma program on symptoms, parent management, grades, and absenteeism. *Chest* 2004;125:1674-1679.

Received January 1, 2005

Accepted after revision May 2, 2005