

Defining asthma for epidemiologic studies: can this objective be attained?

MÁRCIA MARGARET MENEZES PIZZICHINI

Differences and similarities in the prevalence of asthma among countries or within a single country may provide relevant information on the behavior of this condition and on risk factors that may be prevented.⁽¹⁾ However, these differences may simply result in the use of distinct definitions for asthma or in the application of various instruments to measure it (e.g. questionnaires). In addition, there is no universally accepted definition that encompasses the various asthma phenotypes in children and adults.

Defining asthma has always been a subject for discussion. More recently, several established guidelines have defined asthma in a careful, elaborate way, although the result is still unsatisfactory.⁽²⁻³⁾ The lack of an exclusive biological or physiological marker for asthma, or even the lack of asthma symptom specificity, together with the variability of the clinical expression of the disease among patients or even in a single patient, has caused these definitions to be unsatisfactory because they are more descriptive than stipulative. These difficulties in defining asthma account for most of the difficulties encountered in investigating the epidemiology of the disease.

To date, epidemiological studies on asthma have been mainly based on the use of questionnaires. The questionnaire developed for Phase I of the International Study of Asthma and Allergies in Childhood (ISAAC), which was conceived for the determination of the global prevalence of asthma and respiratory symptoms in children from 6-7 to 13-14 years of age, was the first questionnaire that provided uniformity in data collection for these age brackets regardless of cultural differences and language barriers.⁽⁴⁾ The asthma module of the ISAAC Phase I questionnaire comprises four questions regarding the incidence of asthma symptoms (history of wheezing, wheezing within the last year, wheezing upon exertion and nocturnal dry cough), three questions on the severity of symptoms (number of wheezing episodes or attacks in a year, nocturnal wheezing and difficulty in speaking due to wheezing) and one question on the diagnosis of asthma. The results from the ISAAC Phase I questionnaire have shown wide variation in the prevalence of asthma and its symptoms among the various countries and among

regions within a single country.⁽⁵⁻⁶⁾ In Brazil, data regarding the use of the ISAAC Phase I questionnaire have been collected in various cities, including São Paulo (state of São Paulo),⁽⁷⁾ Curitiba (state of Paraná),⁽⁸⁾ Porto Alegre (state of Rio Grande do Sul),⁽⁶⁾ Itabira (state of Minas Gerais),⁽⁹⁾ Recife (state of Pernambuco),⁽¹⁰⁾ Campos Gerais (state of Minas Gerais)⁽¹¹⁾ and Florianópolis (state of Santa Catarina).⁽¹²⁾ The prevalence of having been diagnosed with asthma in these cities ranged from 4.8% to 26.4%. The magnitude and variability reflect what has been seen on the global scale.⁽⁶⁻⁷⁾

The epidemiological study of asthma in adults carries with it additional difficulties, which include the duration of the disease, the type/duration of treatment, occupational exposure, environmental exposure, smoking, comorbidities, etc. The European Community Respiratory Health Survey (ECRHS) is a questionnaire conceived in order to standardize the epidemiological investigation of respiratory symptoms suggestive of asthma, the presence of allergies and treatment use in adults between 20 and 44 years of age.⁽¹³⁾ Similarly to the ISAAC Phase I study, the results obtained by the ECRHS show broad variation in the prevalence of asthma symptoms among the countries under study. This and other standardized questionnaires used to evaluate the prevalence of asthma in adults are still not being used systematically in Brazil.

In this issue of the *Jornal Brasileiro de Pneumologia* (Brazilian Journal of Pulmonology), Maçãira et al.⁽¹⁴⁾ present the results of a study whose objective was to validate a method of constructing a scoring system for the asthma module of the standardized written ISAAC questionnaire and to propose a cut-off point that would identify adults with asthma, assuming clinical and functional diagnosis to be the gold standard. Consequently, the authors randomly selected 40 adults with asthma (15% diagnosed with mild asthma, 45% with moderate asthma, 25% with severe asthma and 15% with no classification of the severity of asthma) and 38 controls. Asthma and control patients were recruited, respectively, from among outpatients at the Pulmonology Clinic and Medical Clinic of the Faculdade de Medicina da Universidade de São Paulo

(University of São Paulo School of Medicine) Hospital das Clínicas. The symptom scoring system was constructed with the help of twenty specialists, including pulmonologists, allergists and general clinicians (all experienced in treating asthma), who assigned a score for each of the questions in the asthma module of the ISAAC questionnaire. Scores ranged from zero to two according to the degree of importance each specialist had attributed to that information for the clinical diagnosis of asthma. The overall score ranged from 0 to 14 points. The study showed that a score equal to 5 points allowed asthmatic patients to be discriminated from controls with 93% sensitivity and 100% specificity. The authors concluded that the validation of a cut-off point in studies on the prevalence of asthma in adults would allow an alternative interpretation of the data provided by the asthma module of the ISAAC questionnaire, taking into account the totality of the data collected rather than only the individual responses to each question.

This study is an excellent example of an initiative towards the creation of a reliable and validated instrument for epidemiological studies of asthma in adults in Brazil. The study is opportune not only because it points out the lack of knowledge regarding the prevalence of asthma in this segment of the Brazilian population but also because it offers the option of a convenient, inexpensive and easy-to-use instrument for research. However, some methodological aspects that can influence the interpretation of results as well as the applicability of the questionnaire in future field research, should be borne in mind.

First, 70% of the patients studied had physician (pulmonologist)-diagnosed moderate or severe asthma, and only 15% had been similarly diagnosed with mild asthma. Although the authors stated that this was unlikely to have affected the cut-off point of the score, the results of future epidemiological studies using this scoring system should be carefully interpreted since it is possible that patients with mild asthma may be underdiagnosed. An alternative approach was that adopted by Grassi et al.,⁽¹⁵⁾ who used a method inverse to that of Maçãira et al. in order to construct a scoring system using the ECRHS questionnaire. In the study conducted by Grassi, the construction of the scoring system was carried out from the investigation of a random sample of participants in the epidemiological study (in which the ECRHS questionnaire was applied). Those participants presented symptoms that were either suggestive of asthma or not and were submitted to

clinical (structured questionnaire) and functional (spirometry and bronchoprovocation with methacholine) investigation. The cut-off point defined by those authors showed a sensitivity (80.1%) and specificity (75.1%) lower than those reported by Maçãira et al., which may have been due to differences in the questionnaires used (despite their similarities), in the population selected to take part in the study and in the methodology used for the construction of the scoring systems.

Second, Maçãira et al. proposed a modification to the ISAAC questionnaire, adding the term "bronchitis" to the specific question regarding the diagnosis of asthma in order to include those asthma patients self-labeled as "suffering from bronchitis". However, the introduction of this term as a synonym for asthma is debatable and, as the authors themselves pointed out, might have an effect contrary to that expected, leading to an overestimation of the prevalence of asthma. Nevertheless, the underdiagnosis of asthma in both children and adults is not exclusive to Brazil. The prevalence of physician-diagnosed asthma depends on how the case is defined, and this depends on the morbidity of the disease, the perception of patients or their families, the perception and conception of their physicians and the access patients have to the health care system. Therefore, it is not difficult to comprehend why, in the ISAAC Phase 1 study, the frequency of asthma symptoms was higher than that of physician-diagnosed asthma, regardless of where the study was conducted.⁽¹⁶⁾ The analysis of the subgroup of participants with wheezing in the last year showed that, in children, asthma is more often diagnosed in those reporting four or more wheezing attacks per year, sleep disturbance due to wheezing and difficulty in speaking due to wheezing. This means that milder asthma (defined only by symptoms) in those studies was more likely to be underdiagnosed.⁽¹⁷⁾

In conclusion, the prevalence of asthma in adults in Brazil should be determined using accurate instruments. The present study represents an initial attempt since it validated a distinct way of interpreting the data obtained using the ISAAC questionnaire. The next step, as suggested by the authors, is the validation of this scoring system in population studies.

MÁRCIA MARGARET MENEZES PIZZICHINI
Núcleo de Pesquisa em Asma e Inflamação das Vias
Aéreas (NUPAIVA, Asthma and Airway Inflammation
Research Group) Clinical Medicine Department;
Universidade Federal de Santa Catarina (UFSC, Federal
University of Santa Catarina) Health Sciences Center,
Florianópolis, Santa Catarina, Brazil

REFERENCES

1. Sears MR. Epidemiology of childhood asthma. *Lancet*. 1997;350(9083):1015-20. Review.
2. Global Initiative for Asthma - GINA. Global Strategy for asthma management and prevention [text on the Internet]. Bethesda (MD): National Institutes of Health; 2002 [cited 2003 Nov 20]. Available from <<http://www.ginasthma.com>>.
3. Sociedade Brasileira de Pneumologia e Tisiologia. III Consenso Brasileiro no Manejo da Asma. Capítulo I. Definição, epidemiologia e patogenia. *J Pneumol*. 2002;28(1):S1-20.
4. Asher MI, Keil U, Anderson HR, Beasley R, Crane J, Martinez F, et al. International Study of Asthma and Allergies in Childhood (ISAAC): rationale and methods. *Eur Respir J*. 1995;8(3):483-91.
5. Worldwide variations in the prevalence of asthma symptoms: the International Study of Asthma and Allergies in Childhood (ISAAC). ISAAC Steering Committee. *Eur Respir J*. 1998;12(2):315-35.
6. Worldwide variation in prevalence of symptoms of asthma, allergic rhinoconjunctivitis, and atopic eczema: ISAAC. The International Study of Asthma and Allergies in Childhood (ISAAC) Steering Committee. *Lancet*. 1998;351(9111):1225-32.
7. Solé D, Yamada E, Vana AT, Costa-Carvalho BT, Naspitz CK. Prevalence of asthma and related symptoms in school-age children in São Paulo, Brazil- International Study of Asthma and Allergies in Children (ISAAC). *J Asthma*. 1999;36(2):205-12.
8. Ferrari FP, Rosário Filho NA, Ribas LFO, Calfele LG. Prevalência de asma em escolares de Curitiba - projeto ISAAC (International Study of Asthma and Allergies in Childhood). *J Pediatr (Rio J)*. 1998;74(4):299-305.
9. Werneck G, Ruiz S, Hart R, White M, Romeu I. Prevalence of asthma and other allergies in Brazilian schoolchildren. *J Asthma*. 1999;36(8):677-90.
10. de Britto MC, Bezzerra PG, Ferreira OS, Maranhao IC, Trigueiro GA. Asthma prevalence in schoolchildren in a city in north-east Brazil. *Ann Trop Pediatr*. 2000;20(2):95-100.
11. Camargos PA, Castro RM, Feldman JS. [Prevalence of symptoms related to asthma in school children of Campos Gerais, Brazil]. *Rev Panam Salud Publica*. 1999;6(1):8-15. Spanish.
12. Piazza HE. Prevalência dos sintomas de asma e rinite em adolescentes da cidade de Florianópolis [tese]. Florianópolis: Universidade Federal de Santa Catarina-UFSC; 2001.
13. Burney PGL, Luczynska C, Chinn S, Jarvis D. The European Community Respiratory Health Survey. *Eur Respir J*. 1994;7(5):954-60.
14. Maçãira EF, Algranti E, Stelmach R, Ribeiro M, Nunes MPT, Mendonça EMC, et al. Determinação de escore e nota de corte do módulo de asma do International Study of Asthma and Allergies in Childhood para discriminação de adultos asmáticos em estudos epidemiológicos. *J Bras Pneumol*. 2005;31(6):477-85.
15. Grassi M, Rezzani C, Biino G, Marinoni A. Asthma-like symptoms assessment through ECRHS screening questionnaire scoring. *J Clin Epidemiol*. 2003;56(3):238-47.
16. Pizzichini MMM, Pizzichini E, Sears MR. Asthma diagnosis and severity of symptoms in Canadian children [abstract]. *Eur Respir J*. 1996;(Suppl 23):1216.