Original Article

Asthma-related hospitalizations and lack of outpatient follow-up treatment*

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Abstract

Objective: To determine whether the children and adolescents with acute asthma attacks admitted to two public hospitals in the city of Recife, Brazil underwent outpatient follow-up treatment for the prevention and control of asthma. **Methods:** A prospective case series study of hospitalized patients with asthma. The patients were asked to complete a questionnaire at admission in order to determine the frequency of prophylactic outpatient follow-up treatment. Patients presenting two or more attacks of asthma that were responsive to bronchodilators were classified as having asthma. **Results:** In the intervals between asthma attacks, 67% (112/167 - data regarding 2 patients were not available) of the patients had been treated only in the emergency room. Although 53.3% (89/167 - data regarding 2 patients were not provided) of the patients had been referred to outpatient treatment, only 16% (27/169) had visited an outpatient asthma clinic regularly for preventive treatment, and only 13% (22/169) had used prophylactic medication. **Conclusion:** Most of the children and adolescents hospitalized with asthma had not undergone preventive outpatient follow-up treatment. Various problems related to the health care system, such as non-referral for outpatient follow-up treatment at hospital discharge, limited access to outpatient clinics, and the cost of prophylactic medication, might have contributed to the low rate of outpatient follow-up treatment in the population studied. Public health care policies that allow asthma control programs to work effectively should be implemented.

Keywords: Asthma; Hospitalization; Ambulatory care.

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Introduction

Asthma is a chronic disease of childhood and adolescence characterized by reversible airway obstruction, with or without treatment, resulting from an underlying chronic inflammatory process that typically involves infiltration of various cell types, among which eosinophils generally predominate.[1] The International Study of Asthma and Allergies in Childhood, involving school children between 6 and 7 years of age and adolescents between 13 and 14 years of age, was conducted in the cities of Curitiba (in the state of Paraná), Itabira (in the state of Minas Gerais), Recife (in the state of Pernambuco), Salvador (in the state of Bahia), São Paulo (in the state of São Paulo), Porto Alegre (in the state of Rio Grande do Sul), and Uberlândia (in the state of Minas Gerais).[2] The results of that study revealed that, despite the wide variation in prevalence (ranging from 10 to 20%) among the several Brazilian cities, asthma is highly prevalent in school children and adolescents. In the city of Recife, the cumulative prevalence rates reported in 1994-95 and in 2002 were, respectively, 21 and 18.2%.[3]

In addition to affecting a significant portion of the population, at a high social and economic cost, asthma is a cause of concern due to underdiagnosis and inadequate treatment.[4,5] The knowledge of the real extent of the disease will allow the formulation of much more effective management plans.[4,6]

In a study conducted in Sweden,[7] it was observed that the number of children with asthma admitted to hospitals have been decreasing in recent decades, despite the high prevalence, probably due to the improvement of the prophylactic treatment for children with severe asthma. However, among the inpatients, there was a higher percentage of socially disadvantaged children.

In the 1990s, several publications, generically designated consensuses, appeared in the literature with the objective of promoting the homogenization of various concepts about asthma,[4,5,8,9] from controversial issues related to diagnosis and classification to the standardization of procedures in children and adults. Such consensuses were intended to reduce the gaps between the various knowledge sources and standardize asthma treatment among general practicioners and specialists so that safe and efficient preventive treatment could be provided beginning at the level of primary care, since most children with asthma are treated without the participation of a specialist.[10]

Some researchers have found that, in the USA, a great number of children with asthma are treated in the emergency room, and that the need for hospitalization is common.[11] In Brazil, visits to the emergency room have been used as a subsitute for regular medical appointments, which is totally inappropriate and leads to failures in the treatment and control of the disease.[12] This places a considerable onus on the children with asthma (days missed from school) and on their parents (days missed from work), as well as on the health care system (high costs).[12,11]

In a retrospective study,[13] the asthma-related hospitalization rates in the American cities of Boston (Massachusetts), Rochester (New York), and New Haven (Connecticut) were evaluated in order to assess the quality of the outpatient treatment provided to the children residing in these three regions. The results revealed a high hospitalization rate in Boston, this rate correlating with the limited access to preventive therapy and with the hospitalization of patients presenting acute asthma attacks of low severity.

Various factors, such as income, level of education, and education about the disease, are implicated in the genesis of asthma-related hospitalization since they are factors that directly influence the access to health care facilities. Similarly, the prevention of predisposing environmental factors is indicated, although the implementation of the consensuses, by emphasizing aspectes directly related to the preventive therapy, seems to exert a considerable influence.[14-17]

The analysis of the level of access that inpatients with exacerbations of the disease have to preventive therapy is of fundamental importance to the reflection on the effectiveness of the treatement and the efficiency of the health care system. The objective of the present study was to determine the percentage of children and adolescents with receiving preventive outpatient follow-up treatment of the disease among those admitted to two public hospitals in the city of Recife, Brazil for acute asthma attacks.

Methods

From January 15 to May 16 of 2001, we carried out a prospective case series study in which we interviewed all of the children and adolescents with asthma admitted to the Maria Cravo Gama Pediatric Hospital and to the Helena Moura Pediatric Unit,

which are primary and secondary care facilities affiliated with the Recife Municipal Government and belonging to the Unified Health Care System.

All participants gave written informed consent. The patients treated in this type of facility are typically individuals who do not have supplementary health insurance and who, in most cases, live under under poor socioeconomic conditions, with a monthly family income of less than 3 times the national minimum wage.

The exclusion criteria were as follows: diagnostic hypothesis of bronchopneumonia; diagnosis of acute bronchiolitis; diagnosis of acute laryngitis; and concomitant presence of an underlying disease, such as brain paralysis, convulsive syndrome, or rheumatic disease.

A definition of asthma was established as follows: two or more episodes of wheezing that were responsive to bronchodilators,[4] for more than 12 months, in individuals over 3 years of age. With the aim of assessing disease severity more objectively, as well as to make it possible to classify asthma as intermittent or persistent and categorize it as mild, moderate, or severe in accordance with the guidelines of the III Brazilian Consensus on Asthma Management, we used a questionnaire developed by other researchers.[18,19,27]

In order to obtain a profile of the socioeconomic conditions, the maternal level of education and family income were selected, from among the various items of the questionnaire, since these factors influence the access to health care facilities.

Regarding the follow-up treatment of asthma, the patients were asked whether they had ever been referred for outpatient treatment in the intervals between asthma attacks by any health professional in the emergency room, whether they had visited any health care facility regularly before being hospitalized, and whether they had received any prophylactic medication. The definition of prophylactic medication was that established in the III Brazilian Consensus on Asthma Management guidelines.[19]

The present study was approved by the Ethics in Research Committee of the Health Sciences Center of the Federal University of Pernambuco.

The information obtained by the questionnaire was codified and stored in two databases built using the Epi Info statistical program, version 6.0, with double data entry for validation (Validate), and was then analyzed statistically (Analysis).

Subsequently, a univariate descriptive analysis was performed, and the percentages of the variables were calculated. Charts, tables, and figures were used for explanation. For the validation of the statistical tests, a 95% confidence interval was adopted.

Results

Table 1 shows some individual and family aspects of the 169 patients with asthma. The mean age

Table 1 - Distribution of 169 children and adolescents hospitalized for asthma by age, gender, level of education of the mother, and family income.

Variable	n	%	Descriptive measurements
Age (years)			—
3–5	95	56.2	Mean = 5.065
5–7	36	21.3	Standard deviation = 2.358
≥ 7	38	22.5	Median = 4.0
			Quartile (25%) = 3.0
			Quartile (75%) = 6.0
Gender			
Male	92	54.4	
Female	77	45.6	
Level of education of the mother[a]			
Illiterate	16	9.8	
1–4 years of schooling	52	31.9	
5–8 years of schooling	66	40.5	
≥ 9 years of schooling	29	17.8	
Total	169	100	

[a]In 6 cases, the individual accompanying the child was unable to provide this information.

of the patients was 5 years, 54.4% (92/169) being male and 45.6% (77/169) being female. Regarding maternal level of education, it was found that 9.8% (16/163) of the mothers were illiterate, and that 72.4% (118/163) had only 1 to 8 years of schooling.

Table 2 shows the aspects of the preventive outpatient follow-up treatment of asthma. In more than half (53.3%) of the cases (89/167 - data regarding 2 patients were not available), the patients had been referred for preventive outpatient treatment of the disease by the emergency room physician. However, most (67%; 112/167) of the children and adolescents had been treated only in the emergency room, and only 33% (55/167) had visited a general or specific outpatient clinic regularly for preventive treatment of asthma.

Table 3 shows that only 16% (27/169) of the hospitalized patients had visited an outpatient asthma clinic regularly for preventive treatment of asthma, and that only 13% (22/169) reported having been prescribed prophylactic medication.

Table 4 shows the distribution of the hospitalized patients by asthma severity. We observed that most (54.7%; 92/168) of these patients had moderate or severe persistent asthma.

In contrast to what is expected and recommended, only 15.2% (14/92) of the patients with moderate or severe asthma underwent preventive outpatient follow-up treatment.

Discussion

Most (67%; 112/167) of the hospitalized patients had been treated only in the emergency room, which reveals that, despite being important, preventive follow-up treatment is far from being freely accessible to low-income individuals. The suffering and the costs of hospitalization could be minimized if the access to outpatient clinics were facilitated, as well as if a national policy of follow-up treatment for patients with asthma were effectively implemented.

Despite the need for a well-conceived plan for preventing future hospitalizations and emergency room visits of these patients, as demonstrated by various authors,[6,20,21] only 33% (55/167) of the individuals interviewed sought follow-up treatment for asthma in the emergency room in the intervals between asthma attacks.

The physician in the emergency room referred 53.3% (89/167) of the patients evaluated in the present study for preventive treatment of asthma. However, the actual percentage of outpatient follow-up treatment was much lower, totaling only 16% (27/169). Once again, this is believed to be due to the existing problems between referral and emergency room visits, which possibly result from the low socioeconomic level and from the limited access to and the lack of outpatient clinic services.

In the United States, some authors have shown that, unlike children with asthma who are of a higher socioeconomic level, poor children with more severe forms of asthma made fewer emergency room visits, were more likely to receive medical care in the emergency room, and were hospitalized more frequently (in 40% of the cases), as well as for longer periods. In the present study, the high percentage of inappropriate management of high-risk patients with

Tabela 2 - Distribution of hospitalized children and adolescents between 3 and 16 years of age by referral and follow-up treatment in the intervals between asthma attacks.

Referral and follow-up treatment in the intervals between asthma attacks	n	%
Referral for preventive treatment of asthma[a]		
Yes	89	53.3
No	78	46.7
Location of follow-up treatment for asthma[a]		
Outpatient clinic	55	33.0
Emergency room only	112	67.0
Total	167	100.0

[a]Data regarding 2 patients were unavailable.

Table 3 - Follow-up treatment at a specific otupatient clinic and use of preventive medication in 169 children and adolescents between 3 and 16 years of age hospitalized for asthma.

Follow-up treatment at an outpatient asthma clinic and use of preventive medication	n	%
Visits an outpatient asthma clinic regularly		
Yes	27	16.0
No	142	84.0
Prophylactic medication		
Yes	22	13.0
No	147	87.0
Total	169	100.0

Tabela 4 - Distribution of children and adolescents between 3 and 16 of age hospitalized for asthma by the functional severity scale[a].

Variable	n	%
Functional asthma severity scale		
Low	30	17.9
Mild	46	27.4
Moderate	76	45.2
Severe	16	9.5
Total[b]	168	100.0

[a]Accurate information regarding 1 patient was unavailable. [b]In one case, asthma severity was not assessed at hospital admission.

asthma is probably a reflection of the urgent need for improvement of the living conditions of the patients and of the Brazilian health care system.

Regarding the use of preventive medication, which is clearly indicated for cases of persistent asthma, it is necessary that asthma be properly classified.[19] According to one author,[20] the ideal management of asthma consists of maintaining the good respiratory status of the patient so that there will be no reason for seeking treatment in the emergency room and no need for hospitalization. In this sense, in addition to general measures, pharmacological treatment is important, and various studies have reported an inverse relationship between the use of inhaled corticosteroids and hospitalization.[14,15,17]

The present study reveals worrisome data regarding the use of pharmacological prevention: only 13% 922/169) of all participants received prophylactic medication. Prioritizing hospitalization over preventive treatment is a paradox that involves weighing the suffering of patients and their families against the cost to the health care system.

Although there are methodological differences among studies on the use of prophylactic drugs, a low percentage of prophylactic drug treatment, with a predominance of values lower than 50% of the patients in the various studies, is generally found. This occurs despite the exhaustive informative measures established in the guidelines. The highest rates of prophylactic pharmacological treatment have been observed in Finland (80%), in the United Kingdom (52.5%), and in the United States (47.5%).[23-25]

In 1988, one group of authors studied 266 children with asthma hospitalized in Australia and found a much higher percentage of individuals using preventive treatment (25%) than that found in the present study (15.2%).[26] However, that study was conducted in a developed country.

As previously mentioned, of the 92 individuals with moderate or severe persistent asthma, only 15.2% (14/92) were using preventive medication, which, in most cases, consisted of inhaled corticosteroids used alone or in combination. Another group of researchers studied 50 children with moderate or severe persistent asthma between 5 and 17 years of age in the Pediatric Asthma Clinic of the Darcy Vargas Hospital, in the city of São Paulo, and found a low percentage of inhaled corticosteroid use (6%), which increased to 94% after the implementation of an educational program, which also made it possible to reduce the number of emergency room visits and the number of hospitalizations, as well as to reduce the functional severity.[27] The slightly higher percentage found in our study might be a sign that the population of hospitalized individuals presented greater disease severity, and might also indicate that, in the two public hospitals, inhaled corticosteroids were available, although inconsistently, for patients who sought treatment in their asthma outpatient clinics. In addition, there might have been greater access to the health care system in the two hospitals evaluated than that found in the above-mentioned hospital in São Paulo.

Yet another group of authors studied 306 patients with moderate or severe persistent asthma between 4 and 15 years of age at admission to a specialized outpatient clinic in the city of Juiz de Fora (in the state of Minas Gerais) and found that the percentage of patients using preventive medication was 14.4%.[28] However, when only the use of inhaled anti-inflammatory drugs (corticosteroids and other medications) was considered, this percentage dropped to 4.6%. In our study, the percentage of preventive medication treatment for all forms of ashtma was only 13% (22/169), and inhaled corticosteroids were the medication prescribed in the vast majority of cases. Nevertheless, what is a cause of greater concern is the fact that more than 80% of the patients with moderate or severe persistent asthma, despite the presence of symptoms, were receiving no preventive pharmacological treatment, which can result in low quality of life, school absenteeism, risk of long-term pulmonary sequelae, and even death.

Therefore, we conclude that the rate at which such patients seek outpatient follow-up treatment for asthma is far from acceptable, which may be a reflection of the situation in which we find the Brazilian Unified Health Care System. The present study reveals that, among patients hospitalized for acute asthma, full access to treatment and to preventive medication is the exception.

Various international studies have demonstrated that the use of appropriate prophylactic treatment, based on patient education, combined with the prescription of preventive medications, presents a quite favorable cost-effectiveness ratio, resulting in clinical improvement and in a reduction in the number of hospitalizations and emergency room visits.[29]

In view of these facts, we suggest that a health care policy allowing the National Asthma Control Program to work effectively, not only in the city of Recife but also in other regions of the country, be implemented.

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