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The treatment of allergic rhinitis improves the recovery from asthma and upper respiratory infections

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Forty-six asthmatic children with repeated respiratory infections presented symptoms of allergic rhinitis. All patients were treated locally for allergic rhinitis either with disodium cromoglycate or beclomethasone dipropionate. After six months of treatment, 95% of the children showed improvement of allergic rhinitis and 84% improvement of bronchial asthma, as well as fewer infections. We concluded that allergic rhinitis plays an important role in facilitating infections of the upper respiratory tract, and a possible association of rhinitis, viral infections and bronchial asthma is discussed.

UNITERMS: Asthma in children. Allergic rhinitis and asthma. Asthma and respiratory infection.

INTRODUCTION

We have long noted a strong relationship between the presence of allergic rhinitis and the signs and symptoms of bronchial asthma. Indeed, Tuft and Muller(21) had pointed out this association in 1970, emphasizing that a third or more of all children with allergic rhinitis would develop asthma if left untreated. These authors added that a detailed examination of the history of some adolescents or young adult patients demonstrated that the onset of perennial rhinitis preceded by many months or even years the beginning of bronchial asthma attacks.

In addition to the presence of allergic rhinitis in asthmatic children, we have observed an association of asthma with recurrent bacterial infection such as otitis media in small children and with tonsillitis and sinusitis in older children, these infectious episodes being associated with the onset of asthma attacks. Similar observations were reported by Mc Intosh et al.(13). In addition, the contribution of viral infections to the pathogenesis of airway hyperreactivity has been reported since the sixties (1,2,4,5,7,8,10,11,13,14,15). Regardless of the mechanisms that determine these associations, the above considerations suggest that allergic rhinitis may be a condition facilitating the onset of these infections, which in turn would lead to the installation of bronchial hyperreactivity. Thus, the treatment of allergic rhinitis may be a way of preventing or decreasing the frequency of respiratory infections, the possible stimulus responsible for the frequent attacks of bronchial asthma. On the basis of this rationale, we have been successfully employing local treatment of allergic rhinitis for several years for children and young adults as the single continuous treatment between attacks.

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Table 1
Signs and symptoms most often detected at first interview in 45 asthmatic children

History	Patients		Physical findings	Patients	
	No.	(%)		No.	(%)
Coryza	44	96	Gaping appearance	27	59
Sneezing	42	91	Altered nasal mucosa	35	76
Nasal pruritis	36	78	V-shaped palate	43	93
Nasal obstruction	42	91	Hypertrophic tonsils	34	74
Otitis media	13	28	Enlarged cervical lymph nodes	26	56
Tonsillitis	19	41			
Pneumonia	23	50			
Family history of atopy	32	70			

The present paper reports the results obtained using this method of treatment for a group of asthmatic children in a systemic, prospective study.

MATERIAL AND METHODS

Forty-six boys and girls aged 1 year and 8 months to 12 years were studied prospectively. All had been diagnosed as having bronchial asthma on the basis of sporadic or frequent attacks of wheezing, coughing and dyspnea requiring bronchodilating medications and at times even hospitalization. Other causes of wheezing such as gastroesophageal reflux and cystic fibrosis were ruled out by specific examination.

A questionnaire was used for each patient to identify the signs and symptoms of asthma and allergic rhinitis and other associated manifestations such as tonsillitis, otitis media and pneumonia. Each patient was then submitted to a physical examination. The signs and symptoms observed are listed in Table 1.

The children included in the study were those with a history of bronchial asthma who had suffered at least three attacks over the last 3 months and who exhibited symptoms such as coughing and slight wheezing or dyspnea between attacks, requiring the use of bronchodilating agents. Associated symptoms were recorded only when they had occurred at least three times during the last year. Of the 46 patients examined at first interview, 38 concluded the study, with bimonthly visits

until the end of a 6-month observation period. The 8 patients who dropped out could not be reached for further contact.

Treatment between asthma attacks was strictly for allergic rhinitis. Thirty-two of the 38 patients received 2% disodium cromoglycate in methyl cellulose as nose drops 3-4 times a day, and the remaining 6 received beclomethasone dipropionate nasal spray, one puff (50 µg) in each nostril 3 times daily. All children used β -adrenergic agents or aminophylline, or both, during the attacks and used an antihistamine drug during the first 20 or 30 nights. The parents were instructed to avoid exposure of their children to major inhalant allergens.

On the occasion of the bimonthly visits, the severity of the asthma and rhinitis manifestations were recorded, as well as the need for bronchodilating agents and the amounts used, plus the occurrence of complications such as tonsillitis, otitis, sinusitis and pneumonia.

Table 2
Presence of rhinitis or asthma as the preceding manifestation in 46 asthmatic children

	No.	(%)
Rhinitis as the preceding manifestation	16	35
Asthma as the preceding manifestation	3	6
Rhinitis and asthma beginning together	23	50
Unknown	4	9

Patients were considered to have improved when, during the last 3 months of the 6-month observation period, they only showed slight and occasional manifestations of asthma or even absence of symptoms and no use of bronchodilators, and discrete or absent rhinitis symptoms.

Each patients served as his/her own control by comparison of his/her clinical picture before and after treatment. Because of the effective results obtained previously with this type of treatment, we felt ethically bound not to use a control group of patients on placebo.

RESULTS

History and physical examination data obtained at first interview showed that all of the asthmatic children studied had perennial allergic rhinitis, the most common symptom being coryza (96%), followed by nasal itching, sneezing and nasal obstruction. Acute bacterial infections such as acute otitis media were reported in 28% of cases and tonsillitis in 39% of cases. Seventy percent of the children had a family history of atopy. Physical examination revealed the presence of V-shaped palate in 93% of the patients and gaping appearance in 59%. Hypertrophied tonsils were evident in 74%, alteration of the nasal mucosa in 76%, and enlarged lymph nodes in the cervical region in 56% (Table 1).

Rhinitis preceded asthma in 35% of cases and occurred simultaneously with asthma in 50% (Table 2). Seven of 11 patients submitted to X-rays presented hypertrophied adenoids.

Table 3 shows that 8 children abandoned treatment. Of the 38 children that completed the 6-month period of

treatment, 92% showed improvement of allergic rhinitis and 84% improvement of bronchial asthma. During treatment, only 2 children had tonsillitis, 1 had sinusitis and none had pneumonia or acute otitis media.

DISCUSSION

The results obtained for the 46 asthmatic children studied showed that they invariably had perennial allergic rhinitis. This association suggests an important role of allergic rhinitis both in the triggering and evolution of bronchial asthma. Nasal obstruction is of itself an important contributing factor by inducing buccal respiration and thus preventing the patients from utilizing the filtration and air conditioning systems of the nose(21). At the same time, chronic inflammation of the nasopharyngeal mucosa leads to anatomical and functional changes, thus lowering both the specific and nonspecific defense ability and leading to a higher susceptibility to infection. This statement is supported by high frequency of hypertrophied tonsils and of cervical adenopathy detected in these patients. It should be pointed out here that the the present data agrees with those obtained by Tuft and Muller(21), who reported that one third of the asthmatic children studied by them had allergic rhinitis before the onset of asthm. Thus, the role of allergic rhinitis may be to facilitate viral infection of the respiratory tract through the nasal route. Among the possibly deteriorated specific defense mechanisms may be the local production of secretory IgA at the nasal mucosa level, an antibody responsible for, among other functions, the fight against viral infections. Low secretory IgA levels have been detected in patients with allergic rhinitis,

Table 3
Effect of 6 months of local treatment of rhinitis on the symptoms of 38 asthmatic children

Treatment	Patients	Rhinitis		Asthma	
		Improved	Unchanged	Improved	Unchanged
Disodium chromoglycate	32	30	2	26	6
Beclomethasone dipropionate	6	6	0	6	0
Total	38	36 (95%)	2 (5%)	32 (84%)	6 (16%)

suggesting a local and transitory deficiency of this immunoglobulin (3,18,19).

Viral infections of the respiratory tract have been held responsible for the onset of bronchial hyperreactivity by many investigators (10,13), and several mechanisms have been suggested for this phenomenon. In addition, chronic inflammation of the nasal mucosa and superimposed acute infections such as tonsillitis, otitis media and sinusitis may stimulate in a nonspecific manner the so-called rhinosinobronchial reflex (17). Indeed, several reports have shown that patients with allergic rhinitis but no bronchial asthma present increased bronchial responsiveness after challenge with cholinergic drugs (6,12,16,20).

It should be emphasized that in the present study, even though the treatment had been strictly limited to the nasal mucosa, improvement occurred in 84% of the asthmatic children. In addition, the symptoms of rhinitis improved in 92% of the children and the infectious episodes were almost totally abolished. With respect to the patients treated with intranasal beclomethasone spray, it may be argued that the treatment of rhinitis had effect on the improvement of bronchial asthma because part of

the drug may have reached the bronchial tree and exerted a direct therapeutic effect there. However, Harris et al. (9) demonstrated that intranasal spray of beclomethasone does not reach the bronchial tree.

On this basis, we may conclude that the repair of the nasal mucosa through treatment restores the local defense capacity as well as the functional capacity of the nose, thus providing effective control of infections of the upper respiratory tract and consequently of the manifestations of bronchial asthma.

Finally, the present results support the suggestion that allergic rhinitis plays an important role in the onset and development of bronchial asthma.

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RESUMO

Materiais e Métodos: Quarenta e seis crianças asmáticas com repetidas infecções respiratórias apresentaram sintomas de rinite alérgica. Todos os pacientes foram tratados localizadamente da rinite alérgica isolada com cromoglicato de disódio e dipropionato de beclometasona. **Resultados:** Após seis meses de tratamento, 95% das crianças mostraram melhora da rinite alérgica e 84% melhora de bronquite asmática, bem como de infecções menores. **Conclusão:** Conclui-se que a rinite alérgica desempenha importante papel na facilitação de infecções do trato respiratório superior, e a possível associação entre rinite, infecções virais e bronquite asmática é discutida.

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