Characteristics of Late-onset Asthma in Elderly Asthmatic Patients

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ABSTRACT

Background: We evaluated the characteristics of late-onset asthma in elderly patients with asthma, particularly concerning the relationship of IgE mediation and response to treatment.

Methods: This study included asthma patients aged 60 or older who were hospitalized under a clinical pathway that provided the treatment of asthma exacerbation, thorough examination, and patient education simultaneously. The patients were divided into two groups, those in whom asthma developed at age 60 or older (late-onset group) and those in whom asthma developed before age 60 (early-onset group). Both groups received step-down therapy with fluticasone dry powder after discharge, and asthma severity was compared between two time points: at 1 year and 2 years after the start of treatment.

Results: One-third of all patients with asthma were aged 60 or older, and half of these had late-onset asthma. There was an inverse correlation between serum IgE levels and the age of onset. The positive rates of specific IgE antibodies to Japanese cedar pollen or house dust mite were significantly lower in the late-onset group than in the early-onset group. Pulmonary functions were equivalent between the two groups. However, asthma severity on admission was lower in the late-onset group. Response to treatment was better in the late-onset group, especially at 1 year of treatment.

Conclusions: Asthma in elderly patients may be divided into early-onset persistent asthma and late-onset asthma with short duration. Late-onset asthma is less IgE-mediated, less severe, and has a better prognosis after appropriate treatment with inhaled fluticasone, and patients are more likely to drop out. For elderly patients with asthma, early detection, repetitive patient education and early intervention with inhaled corticosteroid therapy are important.

KEY WORDS
branchnial asthma, clinical pathway, elderly patient, fluticasone, IgE

INTRODUCTION

With the recent rapid aging of the population, we are seeing an increasing number of elderly patients with asthma. The incidence of asthma has been reported to increase with age.¹ As previously reported,² some elderly patients have early-onset asthma that is severe and persists for a prolonged period, whereas other elderly patients have late-onset asthma that lasts for a short period. We speculated that there may be some differences in the clinical features between the two groups. In other words, since the duration of asthma is shorter in the late-onset group, better response to treatment was expected. In the present study, we compared the characteristics of late-onset asthma with those of early-onset asthma in elderly patients. We also examined whether there was any difference in efficacy of inhaled corticosteroid treatment between the two groups under the same therapeutic strategy.

METHODS

Of 328 asthma patients admitted to our hospital and managed under a clinical pathway of bronchial asthma from 1998 through 2004, 109 patients aged 60 years or older were included in this study. All patients met the American Thoracic Society criteria for asthma. None of the patients were instructed until hospitalization to regularly take inhaled corticosteroids (ICS) at their appropriate dosage. The clinical
pathway of patients who were admitted with moderate or severe asthma exacerbations (defined by the 2002 GINA Guidelines) consisted of simultaneous treatment of asthma exacerbations, thorough examination, and education for an eight-day period. At the time of discharge, improvement in FEV1.0 by 20% or more as compared with that at admission, and chest CT showing no low attenuation areas were confirmed.

After completion of the clinical pathway during the hospital stay, the patients received step-down therapy with ICS (fluticasone propionate dry powder) on an outpatient basis. During the hospital stay, the patients were given careful instructions on how to inhale corticosteroids. The dose of fluticasone was decreased stepwise every 4 months from 800 to 600, 400, 300, 200, and 100 μg/day after discharge if the asthma condition remained ‘totally controlled’ or ‘well controlled’. In the case of the occurrence of an asthma exacerbation during dose reduction, systemic steroids could be used and fluticasone was increased to the previous dose. As concomitant therapy, theophylline and/or pranlukast and/or salmeterol were used until the dose of fluticasone reached 200 μg/day. Salbutamol was used as a reliever. Those whose asthma was poorly controlled with these treatments received oral methylprednisolone. Asthma severity was rated according to the 2002 GINA Guidelines by three allergology specialists. Severity was scored with 1 to 4 points given to steps 1 to 4, respectively, and the scores were compared.

**RESULTS**

Of 328 patients with bronchial asthma who successfully completed the clinical pathway, 109 patients (33%) were aged 60 or older. Of these, 51 (47%) had late-onset asthma (onset at age 60 or older) and 58 (53%) had early-onset asthma (onset before age 60); no significant differences were found between the groups in terms of gender ratio and the number of ‘never smokers’ (Table 1). The duration of asthma was markedly shorter in the early-onset group (3.1 ± 0.4 years) than in the late-onset group (23.8 ± 2.3 years). Serum IgE levels were significantly lower in the late-onset group (242 ± 45 IU/mL) than in the early-onset group (569 ± 105 IU/mL). With regard to pulmonary function, there were no differences in FEV1.0/VCpred or RV/TLC (% pred) between the two groups. Among patients aged 65 or older, there was no difference in mean age (72.9 ± 6.2 vs. 71.0 ± 5.6, n.s.) but serum IgE was significantly lower in patients in the late-onset group (199.4 ± 44.7 vs. 553.6 ± 173.8, p < 0.05). Statistical analysis was performed using the Mann-Whitney U test.

The relationship between serum IgE levels and age of onset in all patients aged 60 or older is shown in Figure 1. There was a significant negative correlation between the two variables (r = −0.415, p < 0.0001).
In this study, we found an inverse correlation between IgE levels and age of onset in elderly asthma patients as a whole. Moreover, IgE levels were lower in the late-onset group. This may be explained by less sensitivity to common allergens such as Japanese Cedar pollen and house dust mite as shown in Figure 2. As previously reported, IgE mediation was thought to be less frequent in the late-onset group. Other mechanisms than IgE mediation may be important for stimulating Th2 cells in elderly onset asthma.

We have been applying a step-down therapy with ICS as early as possible in elderly asthma patients as the basic strategy, as well as in younger asthma patients. As in the GOAL study, our treatment has been aimed at achieving the guideline-defined total control of asthma. As a result, response to such treatment in the late-onset group was better than that in the early-onset group; severity at onset was lower, and more rapid improvement in the severity was shown 1 year after the start of treatment. The primary reason for this is that the duration of asthma from onset is shorter and intervention with ICS is earlier. Since airway wall remodeling is induced by chronic airway inflammation, it is important to start ICS therapy as soon as possible. Early and long term intervention with ICS can prevent airway remodeling. As in other age groups, early intervention with ICS seems to play a key role also in elderly asthma patients.

In this study we applied a new analysis comparing the ‘severity steps’ with the results of longstanding step-down therapy because the guidelines aimed to achieve the step-down of severity if possible. The lung function or symptom score alone were not different between the two groups, because the classification of severity was based on both ‘symptoms and...
Table 2  The prognosis after step-down therapy of fluticasone. Asthma severity was expressed in numbers, based on the severity ratings, steps 1 to 4. Severity at the time of admission, 1 and 2 years later was significantly lower in the late-onset group. Dropout was greater in the late-onset group.

<table>
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<tr>
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<th>onset over 60 y.o.</th>
<th>onset under 60 y.o.</th>
<th>p</th>
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<tbody>
<tr>
<td>start</td>
<td>2.90 ± 0.05 (n = 51)</td>
<td>3.16 ± 0.05 (n = 58)</td>
<td>&lt; 0.002</td>
</tr>
<tr>
<td>1 year later</td>
<td>2.50 ± 0.10 (n = 34)</td>
<td>3.02 ± 0.08 (n = 54)</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>2 year later</td>
<td>2.21 ± 0.14 (n = 29)</td>
<td>2.73 ± 0.11 (n = 51)</td>
<td>&lt; 0.005</td>
</tr>
<tr>
<td>mean ± S.E.</td>
<td></td>
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<td></td>
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<tr>
<td>dropout</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 year later</td>
<td>16</td>
<td>4</td>
<td>&lt; 0.005</td>
</tr>
<tr>
<td>2 year later</td>
<td>17</td>
<td>5</td>
<td>&lt; 0.05</td>
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<td>(n)</td>
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lung function step’ and ‘current treatment step’, and because we tried to maintain the condition totally or well controlled in all patients even if using oral corticosteroids in severe cases.

In this study, 33% of all asthma inpatients were aged 60 or older, and 16% had asthma with onset at age 60 or older. In a Japanese report in 1991, 36% were aged 60 or older and 12% had asthma with onset at age 60 or older. It is thought that in many cases, an appropriate diagnosis is not made in elderly asthmatic patients and less patients are receiving appropriate treatment, which is one of the reasons why asthma death in elderly patients has not decreased. We need to promote appropriate diagnosis and early detection of asthma in the elderly in the future.

However, it is noteworthy that in the late-onset group there were many dropouts, as shown in Table 2. The reasons for this may include a lack of understanding and various complications due to advanced age. In order to improve the prognosis of asthma in elderly patients, the use of potent ICS associated with good compliance such as fluticasone dry powder and the promotion of patient education with the use of a clinical pathway or other method are thought to be important.

REFERENCES