Remission of asthma in the middle aged and elderly: report from the Obstructive Lung Disease in Northern Sweden study

Eva Rönmark, Elsy Jönsson, Bo Lundbäck

Abstract

Background—Remission of asthma in adults has been considered to be low but is still not well documented. In children remission occurs with a rate estimated at approximately 50%. Remission of asthma in middle aged and elderly subjects was investigated as part of a population based study of respiratory diseases in Northern Sweden.

Methods—In 1986 86% of 6610 subjects participated in a questionnaire survey. After a clinical validation study 300 subjects were diagnosed as having current asthma. In 1996 5935 subjects of the cohort could be traced for a third survey and 87% participated. Of the subjects with current asthma in 1986, 267 participated. In addition, 60 symptomatic subjects were classified as suspected asthma and 58 of them participated in 1996. Remission of asthma was defined as no recurrent wheeze, no attacks of shortness of breath, and no use of asthma medicines in 1996.

Results—Remission of asthma during the 10 year period under study was 6%. In subjects with suspected asthma, remission occurred in 22%. The average annual remission rate was less than 1%. Remission was associated with previously mild disease and cessation of smoking.

Conclusion—Remission of asthma or the disappearance of its symptoms to an asymptomatic latent phase appeared to be rare in middle aged and elderly subjects.

Keywords: asthma; remission; middle age; elderly; epidemiology

As part of a population study, the Obstructive Lung Disease in Northern Sweden study (OLIN), an adult cohort with asthma, has been followed for 10 years. The aim of this study was to estimate the proportion of cases of remission of asthma in middle aged and elderly subjects, and factors related to remission.

Methods

In 1986 a cross sectional survey in Northern Sweden was performed in order to estimate the prevalence of respiratory diseases. The study sample consisted of all subjects aged 35–36 years, 50–51 years, and 65–66 years from representative areas in the province. Of the 6610 invited subjects 86% participated in a postal questionnaire survey followed by structured interviews and lung function tests. The questionnaire was validated and 300 subjects (5.3%) were classified as having current asthma. The first follow up survey of the cohort was performed in 1992 and the second in 1996 when 87% of 5935 traced subjects participated.

STUDY POPULATION

The following criteria were used for asthma.

Clinically defined asthma

The 300 subjects who in 1986 reported a history of current asthma (at least two attacks/periods during the last 12 months) including at least three of the following: recurrent wheeze, attacks of shortness of breath, at least two asthma provoking factors, normal breathing between asthma attacks or periods of asthma.

In all but 21 subjects a positive reversibility test (increase in FEV₁ of >15% and >2 dl) or a positive methacholine test (PC₂₀ <4 mg/ml) or case note verified airway variability. The remaining 21 subjects had a convincing history of asthma.

Suspected asthma

Sixty symptomatic subjects not fulfilling the criteria for asthma were classified as suspected asthma.

Furthermore, the following categories of asthma were based on the 1986 questionnaire study.

Self-reported asthma

The subjects who answered yes to “Have you ever had asthma?” and reported either asthma symptoms or use of asthma medicines.

Physician-diagnosed asthma

The subjects who answered yes to “Have you been diagnosed as having asthma by a
Data about age at onset of disease were not available for non-participants or deceased.

They were free from symptoms (in remission).

Number (%) of subjects who had stopped using asthma medicines, irrespective of whether or not.

1986–1996

did not participate in 1996, and those who had died since 1986.

Table 1 Characteristics in 1986 of the asthmatic subjects who in 1996 were in remission and who not were in remission, respectively, the asthmatics who

diagnosis of asthma from 1986 were in remission. No significant differences by age and sex were found. In 1986 seven of the 16 subjects were smokers and two were ex-smokers, while in 1996 five of the smokers had stopped smoking. With regard to socioeconomic group and profession, the cases in remission were distributed without any specific pattern. Neither presence nor lack of a family history of asthma was associated with remission.

Of the 58 subjects with suspected asthma, 13 (22%) were in remission in 1996. Six of them were smokers in 1986 and all six had stopped smoking during the 10 year period under study. Of those who fulfilled the different questionnaire based criteria for asthma, about 6% were in remission (table 1).

REMISSION RELATED TO MORBIDITY DATA
There was a trend for the subjects in remission in 1996 to have a lower prevalence of persistent wheeze and chronic productive cough in 1986. A significantly smaller proportion used asthma medicines compared with asthmatic subjects who had active disease in 1996 (table 2). No significant differences in the age of onset or the duration of asthma was found between the asthmatic subjects in remission and those with active disease.

MULTIVARIATE RELATIONSHIPS
The lack of daily use of asthma medicines, absence of chronic productive cough and of persistent wheeze in 1986, all indicators of mild disease, were factors showing a trend for remission 10 years later. Cessation of smoking seemed to be related to remission of asthma, although it

Table 2 Characteristics in 1986 of the asthmatic subjects who in 1996 were in remission and who not were in remission, respectively, the asthmatics who
did not participate in 1996, and those who had died since 1986. Differences (p value) between remission vs non-remission, non-participants vs participants, and deceased vs all others

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Remission (n = 16)</th>
<th>Non-remission (n = 251)</th>
<th>Non-participants (n = 11)</th>
<th>Deceased after 1986 (n = 20)</th>
<th>Difference (p value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking habits</td>
<td></td>
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<tr>
<td>Non-smokers</td>
<td>7 (43.8)</td>
<td>100 (39.8)</td>
<td>3 (23.1)</td>
<td>6 (31.6)</td>
<td></td>
</tr>
<tr>
<td>Ex-smokers</td>
<td>2 (12.5)</td>
<td>86 (34.3)</td>
<td>2 (15.4)</td>
<td>8 (42.1)</td>
<td></td>
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<tr>
<td>Smokers</td>
<td>7 (43.8)</td>
<td>65 (25.9)</td>
<td>8 (61.5)</td>
<td>5 (26.3)</td>
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<tr>
<td>Lung function</td>
<td></td>
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<tr>
<td>FEV1, % pred median (range)</td>
<td>85 (57–113)</td>
<td>85 (35–134)</td>
<td>86 (69–123)</td>
<td>69 (12–116)</td>
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<tr>
<td>FEV1, % &lt;80% predicted</td>
<td>5 (31.3)</td>
<td>90 (35.9)</td>
<td>4 (33.3)</td>
<td>15 (75.0)</td>
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<tr>
<td>Symptoms and medicines</td>
<td></td>
<td></td>
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<tr>
<td>Chronic productive cough</td>
<td>4 (25.0)</td>
<td>104 (41.4)</td>
<td>8 (61.5)</td>
<td>15 (75.0)</td>
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<tr>
<td>Persistent wheeze</td>
<td>2 (12.5)</td>
<td>72 (28.7)</td>
<td>3 (23.1)</td>
<td>10 (50.0)</td>
<td></td>
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<tr>
<td>Asthma medicines daily</td>
<td>1 (6.3)</td>
<td>74 (29.5)</td>
<td>2 (15.4)</td>
<td>9 (45.0)</td>
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<tr>
<td>Age at onset of asthma*</td>
<td></td>
<td></td>
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<tr>
<td>0–19 years</td>
<td>6 (37.5)</td>
<td>58 (23.1)</td>
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<tr>
<td>20–39 years</td>
<td>5 (31.2)</td>
<td>84 (33.5)</td>
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<tr>
<td>≥40 years</td>
<td>3 (18.8)</td>
<td>69 (27.5)</td>
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<tr>
<td>Don’t know</td>
<td>2 (12.5)</td>
<td>40 (15.9)</td>
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</tbody>
</table>

*Data about age at onset of disease were not available for non-participants or deceased.
Remission of asthma in middle aged and elderly patients

failed to reach statistical significance. If the 58 subjects with suspected asthma, of which 13 were in remission in 1996, were also included in the logistic model, cessation of smoking became a significant independent factor for remission (OR 6, 95% CI 1.4 to 19).

INTERVIEW DATA
Fifteen of the 16 subjects who had a clinical diagnosis of asthma in 1986 and were in remission in 1996 were examined in more detail using a structured interview. None of the 15 reported recurrent wheeze or attacks of shortness of breath. Five subjects were completely free from respiratory symptoms and had not used asthma medicines at all during the previous 12 months.

Discussion
The validity of the results is dependent on the participation rate and the representativeness of the asthmatic subjects under study and, furthermore, on the definitions of asthma and of remission of asthma.

The asthma cohort was derived from a population study and the subjects had been clinically examined. However, the criteria for asthma were distinct and, according to modern day practice, milder symptomatics might have been classified as having asthma. We have therefore also considered the outcome of the 60 subjects with suspected asthma. In some subjects it was not possible to distinguish between asthma and COPD, and these subjects were not included in the asthma cohort.

The subjects who had died during the 10 year period had more severe disease, and the non-participants had more symptoms and were more often smokers, all factors not predicting remission. The fact that we have succeeded in keeping a large proportion of the cohort within the study supports the validity of the results.

There is no generally accepted definition of remission. In the few studies of remission of asthma in adults it has been defined differently. We have defined remission as the absence of use of asthma medicines and of recurrent wheeze and attacks of shortness of breath, as asthma is defined as a symptomatic condition.

The remission of asthma was low in this middle aged and elderly cohort of asthma subjects, 6% in the 10 year period. Among the 58 symptomatic subjects classified as suspected of having asthma, the remission rate was 22%. If they had been included as asthmatics in this study, the annual remission rate would have been less than 1%.

In the Tucson report the criteria for remission was similar to ours but the rate of remission was somewhat greater. Thirty out of 136 asthmatics had gone into remission during a nine year period. A Dutch study defined remission in two ways—absence of bronchial hyperresponsiveness or the absence of asthma symptoms with a normal FEV1, and no hyperresponsiveness, which resulted in an extremely low remission rate.

The limited number of asthma patients in our study lacked sufficient power to reach significance when performing risk factor analyses. However, stopping smoking became a significant factor when the subjects with suspected asthma in 1986 were included in the model. Cessation of smoking has not previously been shown to predict remission of asthma, although smoking is related to a deterioration of asthma.

Others have also shown mild disease to be a factor associated with remission. The degree of bronchial obstruction and hyperresponsiveness in childhood has been shown to be associated with the outcome of childhood asthma.

Self-administered questionnaire based data may give greater remission rates than interview or clinically based data. Some asthmatic subjects regard themselves as healthy due to improvement and deny symptoms when filling questionnaires but may outgrow their asthma.

We conclude that remission of asthma or change of asthma to a non-symptomatic latent phase is rare in middle aged and elderly subjects.

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