

# Asthma in the Elderly – A More Severe Disease

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## ABSTRACT

**Objective:** To determine the severity of asthma in the elderly compared to the younger asthmatics.

**Design:** Cross-sectional study.

**Setting:** University outpatient asthma clinic.

**Subjects:** Asthmatics seen over a 6 month period in 1997.

**Results:** There were 154 patients and 16% were elderly (> 65 years) asthmatics. The elderly asthmatics were on significantly more anti-asthmatic medications ( $2.3 \pm 1.1$  vs.  $1.6 \pm 0.9$ ,  $p < 0.001$ ), and their clinical severity was significantly worse than their younger counterparts (Step  $2.2 \pm 1.2$  vs.  $1.7 \pm 1.0$ ,  $p < 0.001$ ). Near-fatal asthma episodes were also more common in the elderly asthmatics (39% vs 13%,  $\chi^2$  test  $p < 0.01$ ).

**Conclusions:** Elderly asthmatics appear to have more severe asthma as evidenced by the increase in near-fatal episodes, and their increased clinical severity.

**Keywords:** asthma, elderly, near fatal

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## INTRODUCTION

Interest in asthma is generally focused on the young, with emphasis on the paediatric onset and less data exists on the elderly. The National Asthma Education and Prevention Program Working Group in their report emphasised this problem and called for increase research on asthma in the elderly<sup>(1)</sup>. Diagnosis of asthma in the elderly can be a problem when there is a significant smoking history, although the symptoms of asthma (wheezing, cough) in the elderly are similar to those in the younger age group. A study from Tucson, Arizona<sup>(2)</sup> found the incidence of elderly asthmatics (> 65 years old) to be 3.8% of men and 7.1% of women, although an older Welsh survey had reported a prevalence of 5.1% and 1.8% respectively for men and women aged 70 and over<sup>(3)</sup>. Furthermore, a report from England and Wales showed that despite a decrease in

asthma mortality of 6% a year over the past decade for those aged 5 to 64 years, it had only decreased by 2% for those 65 to 74 years old and was unchanged in those aged 75 and over<sup>(4)</sup>. Death rates in USA have also been reported to be higher in the elderly asthmatics than younger patients<sup>(5,6)</sup>.

The Tucson study<sup>(2)</sup> has suggested that the elderly may have more severe asthmatic symptoms which rarely go into complete remission. By contrast, about 50% of children will outgrow their asthma and Panhuysen CIM et al had reported that up to 40% of asthmatics who acquire their disease at around 25 years of age no longer have pulmonary symptoms when they were re-evaluated 25 years later<sup>(7)</sup>. The Tucson study did not however include a concurrent group of younger asthmatics for comparison while Panhuysen et al did not evaluate elderly asthmatics.

We have therefore performed a cross-sectional outpatient study to examine the hypothesis that asthma may be more severe in the elderly asthmatics than in the younger patients.

## PATIENTS AND METHODS

Consecutive out-patients at a university hospital with asthma from December 1996 to May 1997 were subdivided into elderly (> 65 years old), and younger ( $\leq 65$  years old) asthmatics. Asthmatics were defined as patients with wheeze, dyspnoea, cough, with variability in symptoms, and reversible airway obstruction documented in the case notes. Those with a history of smoking had an  $FEV_1 > 80\%$  predicted were studied.

Their age, duration of asthma, current asthma severity (according to NIH criteria - Table I), current medication (number of anti-asthma drugs) and history of near-fatal episodes (syncope, hypercapnia -  $PaCO_2 > 55$  torr, and/or intubations for asthma)<sup>(8,9)</sup> were collated from interviews and case records. The age of onset was defined as time of diagnosis based on history of asthma. The elderly group was compared against the younger group. Data is presented as mean  $\pm$  standard deviation. Chi-squared test (categorical variables) and Student's  $t$  tests (continuous variables) were employed, with a 'p'-value  $< 0.05$  taken as significant.

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**Table I. Classification of asthma severity.**

	Symptoms	Night-time symptoms
Step 4 Severe Persistent	Continual symptoms Limited physical activity Frequent exacerbations	Frequent
Step 3 Moderate Persistent	Daily symptoms Daily use of inhaled short-acting $\beta_2$ -agonist Exacerbations affect activity Exacerbations $\geq 2$ times a week; may last days	> 1 time a week
Step 2 Mild Persistent	Symptoms > 2 times a week but < 1 time a day Exacerbations may affect activity	> 2 times a month
Step 1 Mild Intermittent	Symptoms $\leq 2$ times a week Asymptomatic and normal PEF between exacerbations Exacerbations brief (few hours to few days); intensity may vary	$\leq 2$ times a month

(Guidelines for the diagnosis and management of asthma. Expert Panel Report II. National Asthma Education and Prevention Program.)<sup>(7)</sup>

## RESULTS

There were 154 patients, with 25 elderly asthmatics ( $74 \pm 8$  years of age) compared to 129 younger asthmatics ( $43 \pm 14$  years of age). Only 28% (7 out of 25) of the elderly asthmatics had late-onset asthma (> 65 years old). The elderly asthmatics had suffered from asthma for a slightly longer period ( $20 \pm 13$  years vs.  $15.4 \pm 12$  years,  $p = 0.04$ ) although there was considerable overlap in duration of asthma between the two groups (Fig. 1). The elderly asthmatics were taking significantly more anti-asthmatic medications ( $2.3 \pm 1.1$  vs.  $1.6 \pm 0.9$ ,  $p < 0.001$ ) at the time of the clinic visit. However, their clinical severity was significantly worse than their younger counterparts ( $2.2 \pm 1.2$  vs.  $1.7 \pm 1.0$ ,  $p < 0.001$ ), and they had experienced significantly more near-fatal asthma episodes (39% vs 13%,  $\chi^2$  test  $p < 0.01$ ).

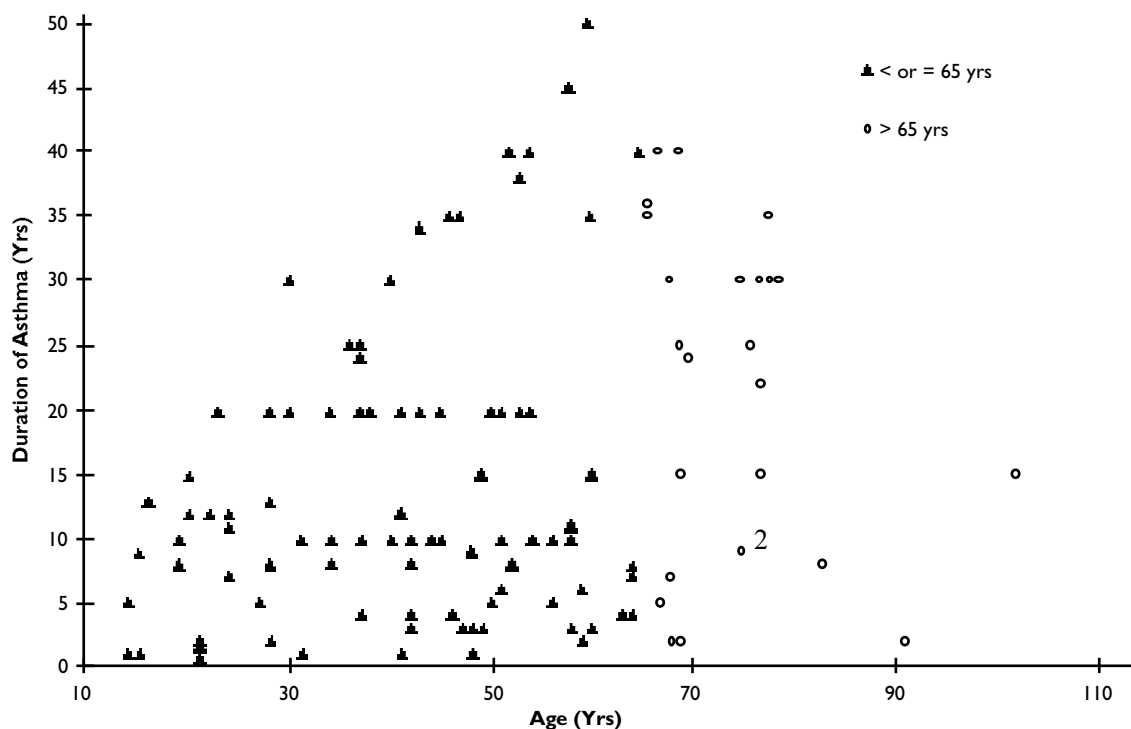
## DISCUSSION

Asthma in the elderly may either be due to late onset (> 65 years old) disease, or part of long-standing asthma which had persisted into old age. Data on elderly asthmatics are not as readily available as for their younger counterparts<sup>(1)</sup>, although the prevalence of bronchial asthma may be higher in the older population and their absolute numbers are therefore not inconsequential<sup>(2)</sup>. For instance, a population-based study in Rochester described that for those with onset of asthma at or after age 65 years, the incidence was 103/100,000 between ages 65 to 74 years, 81/100,000 for 75 to 84 years, and 58/100,000 for >85 years<sup>(10)</sup>. It is also not clear whether there are any specific features that will distinguish those with long-standing disease compared to those with late-onset (> 65 years). Braman et al. studied 25 asthmatic patients over the age of 70, and found that there was no difference in symptoms, medication requirement, and IgE levels between the recent onset group and the group with long-standing disease (mean 31.4 years), although those with early-

onset had a greater likelihood of previous allergic disease and a greater degree of airflow obstruction on lung function testing<sup>(11)</sup>.

This study did not address the true incidence of elderly asthmatics in the community. We studied a consecutive series of asthmatic patients seen in a University outpatient clinic. In our asthma clinic, 16% of the cases were elderly patients with only 4.5% presenting as late-onset asthmatics (Fig. 1). The elderly asthmatics had increased severity of their asthma with more current clinical activity, needed more intensive medication and were at higher risk for near-fatal attacks. This observation is consistent with other studies demonstrating that lung function is significantly lower in long-standing asthmatics<sup>(9)</sup>, complete remissions occurring in <20% of elderly asthmatics compared with 40-50% in younger onset asthmatics<sup>(2,7)</sup>, and asthmatics 65 years and over forming the majority (60%) of asthma deaths in England and Wales from 1983 to 1995<sup>(4)</sup>. The reasons for increased severity were not determined in this study. However, elderly asthmatics are recognised to require more continuous treatment than their younger counterparts (as was found in our study as well), and at a time of their lives when they are more likely to be financially poorer and to suffer from memory loss<sup>(5)</sup>. Precipitants of asthma in the elderly may include the usual viral respiratory infections, irritants, metabisulphite ingestion, aeroallergens, gastro-oesophageal reflux, aspirin, non-steroidal anti-inflammatory drugs, and  $\beta$ -blockers<sup>(5)</sup>.

Our results have demonstrated, for the first time, that elderly asthmatics had significantly more near-fatal episodes. The factors, more prevalent in the elderly, which predispose asthmatics to near fatal attacks are (1) delay in diagnosis and treatment, (2) poor cardio-respiratory reserve, (3) impaired perception of increasing airways obstruction, (5) blunted hypoxic ventilatory drives (4) psycho-social and (5) cognitive



**Fig. 1** This figure plots the age of patients against duration of bronchial asthma. The elderly asthmatics (> 65 years old) had a slightly but significantly ( $p = 0.04$ ) longer duration of asthma but there was considerable overlap between the two groups. Note: There were 2 patients aged 75 yrs who had asthma for 9 years.

problems<sup>(12-14)</sup>. Another important risk factor for status asthmaticus is resistance to beta<sub>2</sub>-adrenergic treatment during acute severe asthma. Strauss L et al have shown that even high dose inhaled albuterol (7.5 mg) may be ineffective in 34% of patients with acute asthma<sup>(15)</sup>. Failure of bronchodilator response in acute asthma is however related to more severe airways obstruction at presentation rather than older age of the patients<sup>(15,16)</sup>.

It is thus important to be cognisant of severe asthma in the elderly population, and treat them, as for the high risk younger patients, in order to relieve their acute symptoms promptly and prevent near-fatal episodes in the long term. It is not clear whether better recognition of severe disease in the elderly will lead to more effective intervention and lower mortality rates. As such, there remains many unanswered questions in the elderly asthmatics. Further research in this area has recently been espoused by the National Asthma Education and Prevention Program Co-ordinating Committee<sup>(1)</sup>.

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