



Clinical Profile and pulmonary function tests in Adult Onset Asthma

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Abstract

Introduction: Asthma can be defined as a chronic inflammatory disorder of airways characterized by inflammation of airway, intermittent airway obstruction and bronchial hyper responsiveness. Though bronchial asthma is more common in pediatric age groups and manifests as recurrent episodes of cough, wheezing and tachypnea (in infants) or breathlessness (in older children) in many of the instances the first episode of symptoms may occur in older individuals in which instance it is known as adult onset asthma. It is important to keep this differential diagnosis in mind in any patient presenting with recurrent cough and episodes of wheezing.

Materials and Methods: This was a prospective study in which 60 patients with late onset asthma were included on the basis of a predefined inclusion and exclusion criteria. Patients having respiratory or cardiac co-morbidities which may have a bearing on clinical features and spirometry results were excluded from the study. Detailed history was taken in all the cases and a thorough clinical examination was taken. Spirometry was done in all the cases. FEV1 values (Percentage of expected FEV1) and Forced expiratory flow at 25-75% of the pulmonary volume (FEF25-75%) was determined in all the cases.

Results: Out of the 60 patients enrolled in this study females were more commonly affected as compared to males with a M:F ratio of 1:2.3. The mean age of the male patients was found to be 49.66 +/- 6.11 years whereas the mean age of female patients was found to be 46.73 +/- 5.98 years. 28 patients (46.67%) had symptoms for 6-10 years. 22 patients (36.67%) had symptoms for 2-5 years. 8 patients (13.33%) had symptoms since less than 2 years whereas 2 (3.33%) patients had duration of symptoms more than 10 years. Out of the studied cases majority of the patients (32/60) were having FEV1 value of more than 70% of expected followed by mild (12/60) and moderately severe asthma (8/60). 38 (63.33%) patients had FEF(25-75%) more than 80% while remaining 22 (36.66%).

Conclusion: Late onset Asthma is increasing with increase in environmental pollution. Its possibility must be kept in mind and should be considered in any adult patient who presents with recurrent episodes of cough and wheezing. Spirometry will help in the diagnosis and alternative diagnosis should be excluded by appropriate investigations.

Keywords: Late onset Asthma, Recurrent Wheezing, Spirometry, FEV1.

Introduction

Asthma can be defined as a chronic inflammatory disorder of airways characterized by inflammation

of airway, intermittent airway obstruction and bronchial hyper responsiveness¹. These pathological changes result into recurrent episodes

of breathlessness, cough and wheezing also known as acute exacerbations. The pathophysiology of asthma is complex and consist of interplay between environmental (such as allergens, microbes, food, microbes and pollution) and genetic factors (Genes such as VDR, DPP10, PHF11 are reported to be involved in atopy and bronchial hyper responsiveness). The other predisposing factors include viral infections, gastroesophageal reflux disease, obesity, stress and drugs such as beta blockers².

Though bronchial asthma is more common in pediatric age groups and manifests as recurrent episodes of cough, wheezing and tachypnea (in infants) or breathlessness (in older children) in many of the instances the first episode of symptoms may occur in older individuals in which instance it is known as adult onset asthma³.

Although Adult onset Asthma also have similar features as childhood asthma such as breathlessness, wheezing and cough the cause of adult onset asthma is less likely to be atopy and genetic factors. In these patients' environmental factors such as air pollution, smoke, respiratory infections and occupational exposure are more common contributing factors. One of the important factors which must be kept in mind in patients with adult onset asthma is that other causes of breathlessness such as congestive cardiac failure, pulmonary edema and respiratory pathologies such as bronchiectasis causing breathlessness and cough must be ruled out by careful clinical examination and appropriate investigations⁴. In these settings demonstration of reversibility of airway obstruction is one of the cardinal features which may help in arriving at the diagnosis of adult onset asthma. In the settings of developing countries of Asia such as India, Pakistan, Bangladesh and Nepal exposure to smoke during cooking is one of the important contributing factors for development of adult onset asthma particularly in females⁵. The diagnosis of adult onset asthma is important because many studies have found that there is an increased risk of coronary heart disease and stroke

in individuals with adult onset asthma. From the point of management these patients it is important to identify individuals who may have predisposition to coronary heart disease and stroke so that appropriate preventive measures can be taken⁶.

The diagnosis of adult onset asthma should be suspected in individuals who present with recurrent cough and wheezing episodes. The possibility of alternative diagnosis responsible for symptoms should be ruled out by appropriate investigations. The diagnosis can be confirmed on the basis of spirometry which will demonstrate reversible airway obstruction responding to bronchodilator medications⁷.

Once the diagnosis is confirmed the management depends upon the severity and frequency of symptoms and usually consist of inhaled steroid and beta agonists. Acute exacerbations may need hospitalization and systemic steroid therapy. In critically ill patients Intensive care unit (ICU) care may be needed. In some intractable cases measures such as heliox inhalation, intubation and artificial ventilation may be required⁸.

With this background in mind we conducted this prospective study in which 60 patients with late onset asthma were included and clinical profile and pulmonary functions tests of these patients were studied.

Materials and Methods

This was a prospective study in which 60 patients with late onset asthma were included on the basis of a predefined inclusion and exclusion criteria. The purpose of this study was to study the clinical profile as well as pulmonary function abnormalities in patients with late onset asthma. 60 patients having their first episode after the age of 40 years and having recurrent episodes of cough, wheeze and breathlessness and who responded well to inhalational therapy and showed marked improvement on spirometry were included in this study. Patients having respiratory or cardiac co-morbidities which may have a bearing on clinical features and spirometry results were

excluded from the study. Diabetics and hypertensive patients having well control of blood pressure and blood sugar levels were included in this study.

In all patients a detailed history was taken with particular emphasis on age at onset of symptoms, duration since first episode, occupational history and family history of atopy and similar illness was taken. A thorough clinical examination was done in all the cases and clinical features were noted. A chest X ray was done in all cases to rule out possibility of respiratory pathologies other than asthma responsible for breathlessness. In selected cases HRCT was done to rule out pulmonary pathology. Spirometry was done in all the cases. During spirometry 3 readings were taken and best of the 3 values were documented.

Inclusion Criteria

1. All patients having first episode of asthma after the age of 40 years.
2. Reversibility of bronchial obstruction documented on the basis of spirometry.
3. Those who gave informed consent to be part of study.

Exclusion Criteria

1. Age less than 40 years.
2. Those who refused consent to be part of study.
3. Patients on serious co-morbid conditions likely to be affecting clinical presentation.
4. Patients too old to be able to perform spirometry.

5. Patients on drugs likely to be causing bronchial obstruction such as beta blockers.
6. Uncontrolled diabetes or hypertension.

Results

Out of the 60 patients enrolled in this study there was a female preponderance. There were 42 females and 18 males with a M:F ratio of 1:2.3.

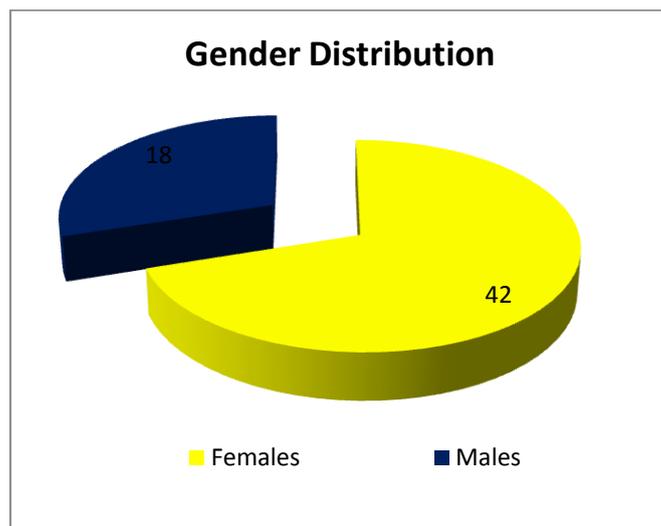


Figure 1: Gender Distribution of the studied cases.

The analysis of the age groups of affected cases showed that the most common age group of the patient at the time of onset of asthma was between 41-45 years in males as well as females. The mean age of the male patients was found to be 49.66 +/- 6.11 years whereas the mean age of female patients was found to be 46.73 +/- 5.98 years. The mean age of males as well as females was found to be comparable with no statistically significant difference (P>0.05).

Table 1: Age group of the affected cases

Age Group	Males		Females	
	No Of Patients	Percentage	No Of Patients	Percentage
41-45 Years	6	10.00%	19	31.67%
46-50 Years	4	6.67%	8	13.33%
51-55 Years	3	5.00%	7	11.67%
56-60 Years	4	6.67%	6	10.00%
> 60 years	1	1.67%	2	3.33%
Total	18	30.00%	42	70.00%
Mean Age	49.66 +/- 6.11 years		46.73 +/- 5.98 years	
	P = 0.0893 (Not significant) 95 % CI=-6.3239 to 0.4639			

The analysis of presenting complaints of the studied cases showed that the most common presenting complaint in studied cases was cough which was present in all the cases (100%). The other common complaints included breathlessness

which was present in 37 (61.67%) patients, on examination wheeze and tachypnea was present in 35 (58.33%) and 32 (53.33%) patients respectively.

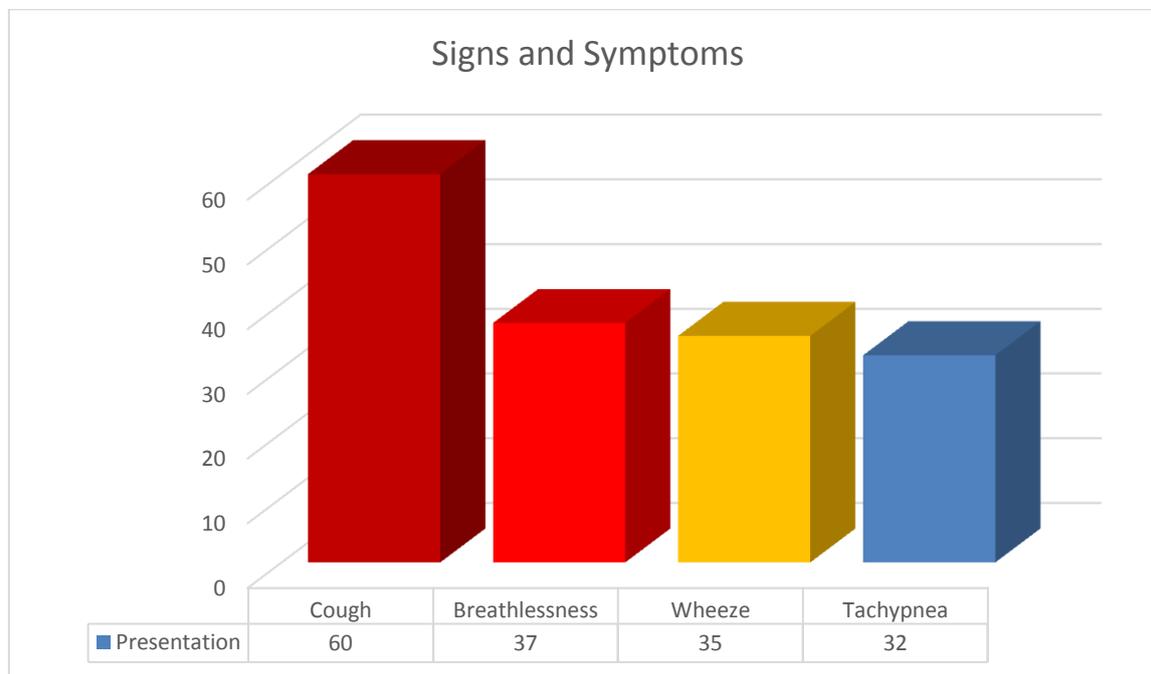


Figure 2: Presenting Complaints in the studied cases

The analysis of the patients on the basis of duration of symptoms showed that out of 60 patients 28 patients (46.67%) had symptoms for 6-10 years. 22 patients (36.67%) had symptoms for

2-5 years. 8 patients (13.33%) had symptoms since less than 2 years whereas 2 (3.33%) patients had duration of symptoms more than 10 years.

Table 2: Duration of symptoms in studied cases

Duration of Symptoms	No of Cases	Percentage
Less than 2 years	8	46.67%
2-5 years	22	36.67%
6-10 years	28	13.33%
More than 10 years	2	3.33%
Total	60	100%

Spirometry was done in all the cases. FEV1 (percentage of expected) of the cases was documented and the cases were divided into having FEV1 more than 70 % (mild), 60-69% (moderate) and less than 50-59% (moderately severe), 34-49% (severe) and less than 34% (very severe). Out of the studied cases majority of the patients (32/60) were having FEV1 value of more

than 70% of expected followed by mild (12/60) and moderately severe asthma (8/60).

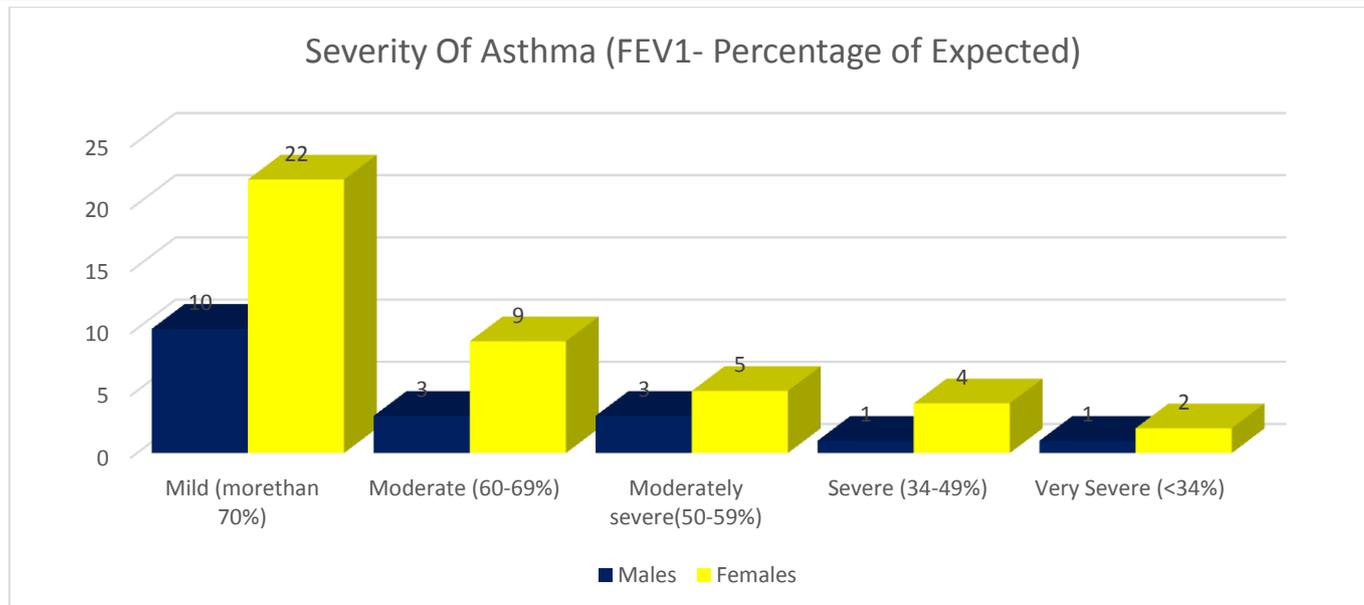


Figure 3: Severity of asthma on the basis of FEV1 values (Percentage of expected FEV1)

Forced expiratory flow at 25-75% of the pulmonary volume (FEF25-75%) was also determined and since reduced FEF(25-75) is defined as < 80% of predicted we divided the cases on the basis of those having (FEF25-75%) more than and less than 80%. 38 (63.33%)

patients had FEF (25-75) more than 80% while remaining 22 (36.66%). Forced expiratory flow at 25-75% of the pulmonary volume (FEF25-75%) was better in younger individuals as compared to older individuals.

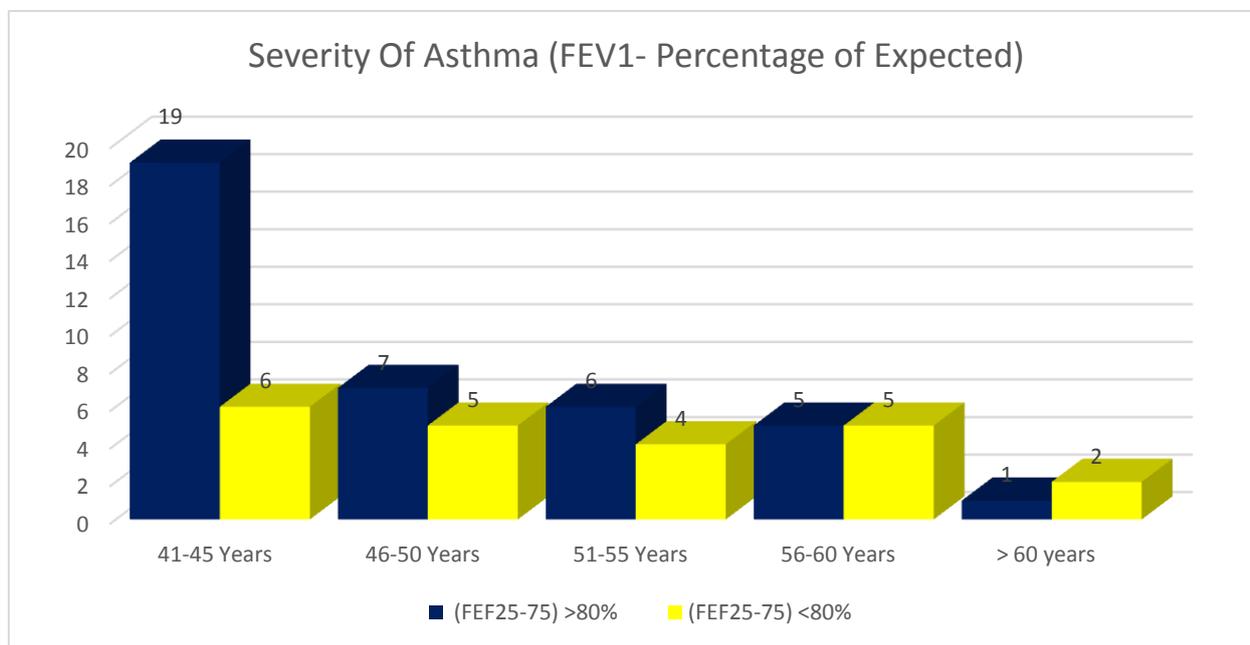


Figure 4: Forced expiratory flow at 25-75% of the pulmonary volume (FEF25-75%).

Discussion

Though asthma is usually a disease of childhood, increased environmental pollution and increased exposure to allergens is causing onset of asthma later in life and more and more individuals are

getting first episode of signs or symptoms later in adulthood. We conducted this study to analyses clinical presentation and pulmonary function tests in these individuals. 60 patients were enrolled in this study on the basis of a predefined inclusion

and exclusion criteria. In our study there was a female preponderance with a M:F ratio being 1:2.3.

In the study conducted by Toren K et al The incidence rate of adult-onset asthma among females was 1.3 cases/1000 person-years compared with 1.0/1000 person-years for males (IRR 1.3, 95% confidence interval [CI] 1.0-1.6)⁹. The incidence rate was high (3.0/1000 person-years) among females aged 16-20 years. There was a strong association between the incidence rate of adult-onset asthma and hay fever, atopic dermatitis and family history of atopy. Similar female preponderance in patients with late onset asthma was also reported by Honkamaki J et al¹⁰ and Larkin E et al¹¹. The proposed mechanism for female preponderance appears to be multifactorial but role of sex hormones appears to be having a predominant factor in causation of asthma in females. This is potentiated by the fact that risk of asthma in females has been reported to generally decrease after menopause, except in women using postmenopausal hormone replacement therapy (TH)¹².

In our study majority of the patients were in their 5th decade of life. The mean age of male patients in our study was found to be 49.66 +/- 6.11 years whereas the mean age of female patients was 46.73 +/- 5.98 years. The female patients were found to have been affected at a slightly younger age. Renymol B et al conducted a study of adult onset asthma in which the authors included 50 patients with adult onset asthma¹³. The authors found that majority of the patients were in the age group 40-49 and 50-59 years. Age of onset of symptoms was below 50 years for 46% of patients. These findings were similar to the findings of our study as far as mean age of the affected cases was concerned. Majority of the patients were from 5th decade of life in our study as well as this study. In other study Toppila-Salmi S et al found the mean age of affected cases to be 53 years¹⁴.

In our study FEV1 (percentage of expected) of the cases in our study was documented and the cases

were divided into having FEV1 more than 70 % (mild), 60-69% (moderate) and less than 50-59% (moderately severe), 34-49% (severe) and less than 34% (very severe). Similarly Forced expiratory flow at 25-75% of the pulmonary volume (FEF25-75%) was also determined and since reduced FEF (25-75) is defined as < 80% of predicted we divided the cases on the basis of those having (FEF25-75%) more than and less than 80%. In our study as the age advances there was gradual worsening of FEV1 and (FEF25-75%) values. This may also be due to age related decline of lung function in patients as reported by Kim SJ et al¹⁵.

Conclusion

Late onset Asthma is increasing with increase in environmental pollution. Its possibility must be kept in mind and should be considered in any adult patient who presents with recurrent episodes of cough and wheezing particularly in absence of fever. Objective documentation (by spirometry) of relief of bronchoconstriction on bronchodilator therapy will confirm the diagnosis in these individuals.

Conflict of interest: None.

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