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Original Research Article

A cross sectional study of patients with poorly controlled asthma at a referral centre

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ABSTRACT

Background: Asthma is a common chronic disease of the airways. Poorly controlled asthma has significant impact on social and economic factors. This study was done to analyse the clinical profile of patients with poorly controlled asthma.
Methods: This is an observational, cross sectional study. Total of 100 patients were evaluated. Data collected included symptomatology, assessment of asthma control by asthma control test scoring, spirometry, body mass index, co-morbidities and allergy testing report.
Results: Among the 100 patients studied, 52% (n=52) were in the age group of 30 to 60 years. 48% (n=48) were males and 52% (n=52) were females. 76% (n=76) patients had adhered to treatment for bronchial asthma as advised which was in line with standard therapy. 86% (n=86) had co-existing illness. They included allergic rhinitis, obesity, GERD, anxiety, atopic dermatitis and chronic urticaria. 78% (n=78) of these cases were sensitized to indoor and outdoor allergens. 89% of sensitized cases were to house dust mite (n=70 of 78). This was followed by cockroach sensitization which was seen in 30.7% cases (n=24 of 78). Other allergens included pollens in 28.2% cases (n=22 of 78), aspergillus in 25.6% cases (n=20 of 78) and food allergens in 23% cases (n=18 of 78).
Conclusions: Poorly controlled asthma cases require detailed evaluation of comorbid conditions and allergen sensitization profiles. Management of these conditions along with allergen control measures may benefit these patients along with step up of therapy.

Keywords: Asthma, Allergens, Comorbidity, Poorly controlled

INTRODUCTION

Asthma is a chronic disease where the airways are hyperresponsive.[1] This results in airflow limitation that is significantly reversible. Due to the reversible nature of airway obstruction it presents clinically with recurrent episodes of wheezing, breathing difficulty and cough.[1] The incidence of asthma has been increasing and it is estimated that 339 million people worldwide are suffering from asthma as per the report of 2018. Asthma is reported to kill a thousand people every day.[2] The earlier belief that asthma is a disease of high-income countries is being challenged since most cases now are from low- and middle-income nations.[2] The current estimate of prevalence of asthma in India is 2.05% in individuals greater than 25 years. That roughly estimates to 18 million people suffering from asthma in the country.[3] Asthma that is well controlled does not cause

much of economic and personal burden.[2] Though clinical research shows that asthma control is an achievable target, it is frequently not so in clinical practice.[4] Poorly controlled asthma has significant impact with loss at school and work, poor quality of life, increased health care resource consumption and economic burden.[3,4]

In 2006, GINA emphasized treatment by asthma Control.[5] Accordingly, asthma was classified as "controlled", "partly controlled" and "uncontrolled". Asthma is said to be controlled when the day time symptoms are less than twice per week, there are no nocturnal symptoms, there is no limitation of activity, use of reliever medication is less than twice per week and spirometry is normal. Partly controlled asthma is when there are one or two of the features with day time symptoms more than twice per week, reliever medications more than twice per week, any night symptoms, any limitation of activity and spirometry PEF or FEV1 is less than 80%. Uncontrolled asthma is when there are three or more features of partly controlled asthma in any week.[5] However, the 2015 update of GINA has modified the definition of asthma control. The asthma control now includes two domains which was symptoms and risk factors. Lung function and symptoms are considered separately. Risk factors which include several modifiable and non-modifiable factors should be considered since they can affect treatment outcome and do not always require step up of therapy.[6]

Numerous standardized clinical tools and questionnaires are available to assess asthma control. Asthma Control Scoring System (ACSS), Asthma control questionnaire (ACQ), Asthma Control Test (ACT) and Asthma Therapy Assessment Questionnaire (ATAQ) are among a few of them.[7-10]

Various factors have been implicated in poorly controlled asthma. These include disease related factors like comorbidities (rhinitis, gastro oesophageal reflux disease, obstructive sleep apnoea, obesity), allergen exposure, sensitivity and disease phenotype.[4] Patient related factors like adherence to treatment, psychological characteristics, expectations and behavior also contribute to the same. Lastly doctor related factors like misdiagnosis, knowledge and attitude towards guidelines are also important to assure appropriate therapy and control of asthma.[4] This study was done to analyze the clinical profile of patients who were diagnosed with poorly controlled asthma on presentation at a referral centre.

METHODS

Present was an observational, cross-sectional study done on patients with poorly controlled asthma at a referral centre.

Patients presenting with respiratory complaints were screened. They were diagnosed with poorly controlled asthma based on symptomatology and spirometry. The study population included poorly controlled asthma patients meeting the inclusion criteria. The poorly controlled asthma cases which met the exclusion criteria were not taken into this study.

The duration of this study was one year between 1st June 2017 to 31st May 2018.

Inclusion criteria for patients

- Clinical symptoms and signs suggestive of asthma in individuals >14 years,
- Spirometry showing obstruction with 12% reversibility and ≥200 ml reversibility,
- Poorly controlled asthma as assessed by symptomatology and asthma control test (ACT) score <20.

Exclusion criteria for patients

- Post bronchodilator FEV1/FVC less than 0.70,
- Smokers,
- Normal spirometry,
- Occupational exposure to allergens.

Methodology and data analysis

The study population was asked questions pertaining to therapy for asthma, adherence to treatment and technique of inhaler use. They were asked to rate on a scale of 1 to 5 their asthma control in past 4 weeks as per ACT. The questions included the limitation of routine activities (school/ work) due to asthma, shortness of breath, night symptoms, rescue medications and patients' own perception of asthma control. Their height, weight, body mass index (BMI), symptoms and signs of co-existing illness was recorded. Skin prick testing was done using standardized allergens as per protocol. The skin prick testing was correlated with exposure to allergens wherever it was necessary. The data was entered into SPSS software and analysed using tables, cross tables, frequencies and comparisons.

RESULTS

A total of 100 patients were studied. 52% (n=52) were in the age group of 30 to 60 years. 48% (n=48) were males and 52% (n=52) were females. 76% (n=76) patients had adhered to treatment for bronchial asthma as advised which was in line with standard therapy for asthma. Only 24% patients (n=204) were not on appropriate therapy or had not adhered to their treatment. Patient characteristics and clinical profile of poorly controlled asthma patients are shown in Table 1. About 86% (n=86) had co-existing illness. The most common co existing illness was allergic rhinitis seen in 93% cases (n=80) followed by obesity (BMI ≥30) seen in 16.3% (N=14), GERD in 13.9% (n=12), psychiatrist diagnosed anxiety in 9.3% (n=8), atopic dermatitis in 4.6% (n=4) and chronic urticaria in 2.3% (n=2). Female patients were found to have more

frequently co-morbidities than males. Gender and age wise distribution of comorbidities is shown in Table 2.

Table 1: Patient characteristics and clinical profile of poorly controlled asthma patients.

Patient characteristics	Number (%)
Age	
14 to 30 years	44 (44)
30 to 60 years	52 (52)
>60 years	4 (4)
Gender	
Male	48 (48)
Female	52 (52)
Adherence to treatment	
Yes	76 (76)
No	24 (24)
Presence of comorbidity	
Yes	86 (86)
No	14 (14)
Sensitization to allergens	
Yes	78 (78)
No	22 (22)

Table 2: Gender and age wise distribution of comorbidities.

Physical characteristic	Allergic rhinitis	Obesity	GERD	Anxiety	Others
Male	38	0	4	2	6
Female	42	14	8	6	0
14-30 yrs	38	0	4	4	4
30-60 yrs	40	14	8	4	2
>60 yrs	2	0	0	0	0

About 78% (n=78) of these cases were sensitized to indoor and outdoor allergens. 89.7% of sensitized cases were to house dust mite (n=70). This was followed by cockroach sensitization which was seen in 30.8% cases (n=24).

Other allergens included pollens in 28.3% cases (n=22), aspergillus in 25.6% cases (n=20) and food allergens in 23.1% cases (n=18).

House dust mite and cockroach sensitization were more frequently found in males, while pollen and aspergillus sensitization were more frequently seen in females. Gender and age wise distribution of sensitization profile of poorly controlled asthma patients is shown in Table 3.

Table 3: Gender and age wise distribution of sensitization profile of poorly controlled asthma patients.

Physical characteristic	House dust mite allergen	Cockroach allergen	Pollen allergen	Aspergillus allergen	Food allergen
Male	36	18	8	6	14
Female	34	6	14	14	4
14- 30 yrs	34	12	4	8	4
30-60 yrs	34	12	18	12	12
>60 yrs	2	0	0	0	2

DISCUSSION

In this study, most cases of poorly controlled asthma had adhered to the treatment and where on appropriate guideline-based therapy (76%). The rate of adherence varies across studies and most studies show less than 50% adherence to treatment in cases of poorly controlled asthma. Mognani MS et al, found that more than 40% cases of uncontrolled asthma had poor adherence to therapy.[11] Chapman S et al, who studied asthma patients in age group of 18-55 years, found that among 46.1% cases that reported uncontrolled disease, most had some non-adherence to treatment.[12] However, a study done in Brazil which included 160 severe asthmatics found that 70.9% patients had adhered to treatment.[13] The high rate of adherence in this study may be because being a referral care, most cases presented to us after being treated by primary care physicians. Most of the patients had co morbidities (86%). Allergic rhinitis was the most common coexisting disease. Others included obesity, GERD, anxiety and atopic dermatitis. Demoly P et al, analysed asthma control in five European nations in 2006, 2008 and 2010. They found that the percentage of uncontrolled cases were 55%, 56.6% and 53.5% respectively.[14] Among the uncontrolled cases there were higher percentage of females, age more than 55 years, smokers, obesity, depression, anxiety and sleep problems.[14] Similarly, another study done by Stevens M et al, found that obesity (18.5% vs 7.6%), depression (4.6% vs 1.1%), GERD (18.3% vs 10.5%) and rhinitis (46.6% vs 46.4%) were more common in poorly controlled asthma than well controlled cases.[15] Hwang EK et al, studied poorly controlled asthma in elderly. They found that 49% were atopic and 7.5% were obese. More than 80% of cases had co morbid conditions. The most common was allergic rhinitis which was followed by cardiovascular disease and degenerative arthritis.[16] MOSAR study which was a multicentred observational study of asthma patients in Rabat, found that six factors

were associated with asthma control. They are respiratory infections, concomitant diseases, animal's allergy, adherence to treatment, health insurance and having more than two children.[17]

These findings are similar to this study results. This highlights the importance of looking for comorbidities in cases of poorly controlled asthma, which could be adequately managed prior to stepping up therapy for asthma.

Significant percentage of poorly controlled asthma patients in this study had sensitization to indoor allergens like house dust mite, cockroach, pollens and fungi. Tanaka A et al, found that sensitization to fungi was associated with poor asthma control. On the other hand, sensitization to house dust mites, pollen, Japanese cedar, furry animals or insects was not associated with poor asthma control in their study.[18] Another study done by Burbank AJ et al, found that tree and weed pollen sensitization was independent risk factor for poorly controlled asthma in African-American children.[19] Rhee H et al, found that pest allergies (cockroach and mouse) were associated with poorly controlled asthma. Cockroach allergies was associated with 2.2 times as many specialist visits, while mouse allergies was associated with 1.6 times as many emergency department visits.[20] These results are similar to this study findings and this points towards doing a detailed sensitization testing for cases of poorly controlled asthma. In such cases, it may be necessary to re-consider environmental and allergen control measures. These patients may also benefit from desensitization to allergens.

In this study, 52% cases of poorly controlled asthma were females. Gender differences were also found in the comorbidities and sensitization. Comorbidities were more frequently seen in females. House dust mite and cockroach sensitization were more frequently found in males, while pollen and aspergillus sensitization were seen mostly in females. One Brazilian study which interviewed 400 patients with asthma, found that 68% of cases were females. They also found that females reported more symptoms, higher limitation of activity and poorer quality of life.[21] Hwang EK et al, found that 54.6% cases of poorly controlled asthma in elderly were females.[16] These results varied from another Canadian survey which found that men and women were equally likely to have poorly controlled asthma (56% vs 58%). They found that women were more frequent users of inhaled corticosteroids and had better asthma knowledge than men. However, women more frequently used emergency care compared to men.[22] Singh AK et al, who studied the clinical profile of all asthma cases of varying severity found that most cases were reported in males (80%).[23] Clinical studies have shown that there is gender disparity in asthma prevalence. Though the exact mechanism is unknown various possible mechanisms have been implicated for this. It has been postulated that estrogen may increase Th2 and IL-17A mediated airway inflammation.[24]

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REFERENCES

1. Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2018. Available at www.ginasthma.org.
2. Global Asthma Network. The Global Asthma Report, 2018. Available at http://globalasthmareport.org.
3. Koul PA, Patel D. Indian guidelines for asthma: Adherence is the key. Lung India off Organ Indian Chest Soc. 2015;32(1):S1.
4. Braido F. Failure in asthma control: reasons and consequences. Sci. 2013.
5. Koshak EA. Classification of asthma according to revised, 2006. GINA: evolution from severity to control. Ann Thoracic Med. 2007;2(2):45.
6. Reddel HK, Bateman ED, Becker A, Boulet LP, Cruz AA, Drazen JM, et al. A summary of the new GINA strategy: a roadmap to asthma control. Euro Resp J. 2015;46(3):622-39.
7. LeBlanc A, Robichaud P, Lacasse Y, Boulet LP. Quantification of asthma control: validation of the Asthma Control Scoring System. Allergy. 2007;62(2):120-5.
8. Juniper EF, Svensson K, Mörk AC, Ståhl E. Measurement properties and interpretation of three shortened versions of the asthma control questionnaire. Resp Med. 2005;99(5):553-8.
9. Nathan RA, Sorkness CA, Kosinski M, Schatz M, Li JT, Marcus P, et al. Development of the asthma control test: a survey for assessing asthma control. J Allergy Clin Immunol. 2004;113(1):59-65.
10. Skinner EA, Diette GB, Algatt-Bergstrom PJ, Nguyen TT, Clark RD, Markson LE, et al. The asthma therapy assessment questionnaire (ATAQ) for children and adolescents. Dis Man. 2004;7(4):305-13.
11. Magnoni MS, Latorre M, Bettoncelli G, Sanchez-Herrero MG, Lopez A, Calvo E, et al. Asthma control in primary care: the results of an observational cross-sectional study in Italy and Spain. World Allergy Org J. 2017;10(1):13.
12. Chapman S, Dale P, Svedsater H, Stynes G, Vyas N, Price D, et al. Adherence to asthma medication and preferences for once-daily treatment: Importance of treatment intrusiveness and patient beliefs. Euro Resp J. 2016;48(60):PA5018.
13. Souza-Machado A, Santos PM, Cruz ÁA. Adherence to treatment in severe asthma: predicting factors in a program for asthma control in Brazil. World Allergy Org J. 2010;3(3):48.

14. Demoly P, Annunziata K, Gubba E, Adamek L. Repeated cross-sectional survey of patient reported asthma control in Europe in the past 5 years. Eur Respir Rev. 2012;21(123):66–74.
15. Stevens M, Stokes J, Walters R, Schatz M, Casale T. Rates of comorbidities are related to level of asthma control. J Allergy Clin Immunol. 2014;133(2).
16. Hwang EK, Jin HJ, Nam YH, Shin YS, Ye YM, Nahm DH, et al. The predictors of poorly controlled asthma in elderly. Allergy Asthma Immunol Res. 2012;4(5):270-6.
17. Ghanname I, Chaker A, Hassani AC, Herrak L, Ebongue SA, Laine M, et al. Factors associated with asthma control: MOSAR study (Multicenter Observational Study of Asthma in Rabat-Morocco). BMC Pulmonary Med. 2018;18(1):61.
18. Tanaka A, Fujiwara A, Uchida Y, Yamaguchi M, Ohta S, Homma T, et al. Evaluation of the association between sensitization to common inhalant fungi and poor asthma control. Ann Allergy Asthma Immunol. 2016;117(2):163-8.
19. Burbank AJ, Grabich SC, Todorich K, Frye M, Loughlin C, et al. Effect of aeroallergen sensitization on asthma control in African American teens with persistent asthma. Ann Allergy Asthma Immunol. 2016;117(4):442-4.
20. Rhee H, Love T, Harrington D, Grape A. Common allergies in urban adolescents and their relationships with asthma control and healthcare utilization. Allergy Asthma Clin Immunol. 2018;14(1):33.
21. Zillmer LR, Gazzotti MR, Nascimento OA, Montealegre F, Fish J, Jardim JR. Gender differences in the perception of asthma and respiratory symptoms in a population sample of asthma patients in four Brazilian cities. J Bras Pneumol. 2014;40(6):591-8.
22. Day A, Ernst P, Glick L, Zimmerman S, Chapman KR. Women and asthma: lessons from a gender analysis of the asthma in Canada survey. J Asthma. 2006;43(2):169-73.
23. Singh AK, Jain VK, Mishra M. Clinical profile of bronchial asthma patients reporting at respiratory medicine outpatient department of teaching hospital. Ind J Allergy Asthma Immunol. 2015;29(1):3.
24. Fuseini H, Newcomb DC. Mechanisms driving gender differences in asthma. Current Allergy Asthma Rep. 2017;17(3):19.

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