

CLINICAL AND DEMOGRAPHIC PROFILE OF PATIENTS DIAGNOSED AS BRONCHIAL ASTHMA IN A TERTIARY CARE CENTRE

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ABSTRACT

BACKGROUND

Bronchial asthma is a chronic inflammatory disease of the air ways and is of heterogenous aetiology characterized by episodes of wheeze, chest tightness, cough and shortness of breath. It is one of the most common diseases worldwide and nearly 300 million suffer from attacks of bronchial asthma every year.¹

METHODS

We have taken a total of one hundred patients diagnosed as bronchial asthma, aged above 18 years and analysed their age, gender, duration of illness, frequency of symptoms, diurnal variation, time of attack of bronchial asthma and season of attack. We analysed the severity with peak flow meter and spirometry and analysed the reversibility of airway obstruction at the time of diagnosis 15 minutes after salbutamol dry powder inhalation.

RESULTS

Age of the patients ranged from 21 to 60 years. In our study of hundred patients, 55% are females and rest are males. Peak prevalence is seen among both males and females in the 41-60 years age group. 52% patients had 2 to 5 years of history. 31% had less than 2 years of history and 17% showed more than 5 years of history. 33% of the patients had daily attacks with nocturnal symptoms and 19% had attacks more than twice weekly requiring rescue medication. Diurnal variation was seen in 66% of the patients. 59% of the patients had attacks predominantly seen in winter and 14% had attacks throughout the year. 9% of patients showed summer-time attacks of bronchial asthma. 18% had attacks in rainy season. Only 13% patients showed >12% reversibility in FEV1 at the time of enrolment. At the time of enrolment mild obstruction was seen in 21%, moderate obstruction in 33%, and severe obstruction in 44%. Symptoms improved every week. Good response with 80% of patients showing more than 60% FEV1 was seen after 4 weeks of treatment. 20% patients continued to have less than 60% FEV1 and 12% of them have less than 40% FEV1 after 4 weeks of treatment.

CONCLUSIONS

Asthma occurred predominantly in 40-60 years of age. Females outnumbered males in our study. More than half the patients gave a history of 2-5 years. Half the patients had more than twice weekly attacks. Diurnal variation was seen in two thirds. Winter attacks were predominant in 59% and 14% of patients showed no seasonal variation. More than 12% reversibility was seen in only 13% at the time of admission into the study. 80% of patients improved symptomatically at the end of four weeks.

KEYWORDS

Bronchial Asthma, FEV1 (Forced Expiratory Volume 1), Study Population, Age Distribution, Gender Distribution, Seasonal Attacks, Perennial Attacks, Diurnal Variation

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BACKGROUND

Asthma is a heterogenous disease characterized by chronic airway inflammation. It presents with symptoms of cough, wheeze, shortness of breath and chest tightness of varying intensity and is associated with variable airflow obstruction. More than 300 million suffer from attacks of bronchial asthma and is a cause of considerable morbidity and mortality.¹ Many inflammatory cells and cellular components, cytokines and chemokine play a role, in

particular Mast cells, Eosinophils, T-lymphocytes, Neutrophils and Epithelial cells. This inflammation causes episodic symptoms of varying severity in susceptible persons.

Asthma is a heterogenous disease and has multiple phenotypes and each phenotype responds differently to treatment.² Allergic asthma, non-allergic asthma, obesity associated asthma, drug induced asthma, late onset asthma, neutrophilic asthma and eosinophilic asthma are a few phenotypes. Approach to management may be different in different phenotypes.¹ Asthma is diagnosed by clinical history, diurnal variation of pulmonary functions and by observing the reversibility of airway obstruction. Asthma COPD overlap disease which has the features of both the diseases presents with poorly reversible airway obstruction and is associated with poor response to therapy. The severity of asthma is measured by frequency of symptoms, nocturnal attacks, interference with day to day activity and sleep disturbance.³ Bronchial asthma presents with multiple phenotypes though the symptomatology is the same. Study of Demographic data, history of atopy, family history and season of attack and time of acute episode can help us understand the illness better to give a better relief to the patient.

METHODS

We have studied a total of one hundred patients diagnosed as bronchial asthma in NRI Medical College Hospital, Guntur. The patients were diagnosed on the basis of history, physical examination and pulmonary function tests. The study was conducted over a period of 8 months from June 2018 to February 2019. Patients above 18 years diagnosed as bronchial asthma excluding patients requiring emergency treatment or hospitalization within last 4 weeks, pregnant and lactating women, patients who are mentally retarded, patients with known allergy to anti asthmatic medication and smokers, were included in the study. Ethical committee approval was taken from ethical committee of NRI Medical College and Chebrolu Hanumaiah Institute of Pharmaceutical Sciences, Guntur. The patient’s demographic data, therapeutics data and various other relevant and necessary data were obtained from the medical records, patient interviews and a suitably designed patient data collection form.

We have included a total of one hundred patients of bronchial asthma and analysed their demographic and clinical symptoms using simple spirometry. 52% of the patients gave family history of asthma and 48% of patients gave no family history. 82% patients took bronchodilator therapy in some form or other before coming to hospital. 42% of patients in our study showed a definite allergic history and 18% attributed their attacks to winter infections. 39 patients gave the history of allergic rhinitis but only 23 patients had initiation of their episodes of bronchial asthma initiated with allergic rhinitis.

RESULTS

We have taken a total of one hundred cases of bronchial asthma who presented with history of reversible attacks of

airway obstruction to the department of Pulmonology, NRI Medical college Hospital, Chinakakani, Guntur District. Majority of patients of bronchial asthma (76%) are in the age range of 21 to 60 years. In our study of hundred patients 55% are females and rest are males. Peak prevalence is seen among both males and females in the 41-60 years age group. Among the patients of bronchial asthma 52% presented with 2 to 5 years history. 31% of patients had a history of less than 2 years. 48% of the patients had <twice weekly episodes, 1% had more than twice weekly but less than once in a day episode and 33% had daily episodes of asthma and a majority of them with nocturnal symptoms. 66% of patients showed diurnal variation in pulmonary functions. 62% of the patients had nocturnal and early morning episodes of asthma. 77% of patients had their episodes of asthma in winter or rainy season. 14% of the patients had their episodes of asthma throughout the year. 9% of patients had episodes of predominantly in summer. Assessment of patients at the time of enrolment into the study revealed 87% of the patients had <12% improvement in FEV1 15 minutes after salbutamol administration. Only 13% had more than 12% improvement in FEV1. Though the reversibility was less than 12% improvement in FEV1 at the time of enrolment in 87% of patients were inducted into the study because of their clinical history, diurnal variation and response to treatment in the previous episodes. 12% of patients continued to have low FEV1 of <40% predicted after 4 weeks of treatment and probably belong to Asthma COPD overlap group. Study of severity of airway obstruction at the time of enrolment showed 21% had mild obstruction (60 to 80% predicted), 33% had moderate obstruction and 46% had severe obstruction (<40% FEV1). At the end of four weeks of treatment only 12% continued to have <40% FEV1.

Parameter	No. of Patients	Percent age
Family History of Bronchial Asthma	52	52%
No Family History of Asthma	48	48%
Definite Allergy History	42	42%
History of Allergic Rhinitis	39	39%
Asthma Episodes Initiated by Allergic Rhinitis	23	23%

Table 1. History of Allergy and Allergic Rhinitis

Age in Years	No. of Patients	Percentage
0-20	5	5%
21-40	32	32%
41-60	44	44%
61-80	18	18%
81-100	1	1%

Table 2. Age Distribution of the Study Population

Gender	No. of Patients	Percentage
Male	45	45%
Female	55	55%

Table 3. Gender Distribution

Duration of Illness	No. of Patients	No. of Male Patients	No. of Female Patients	Percentage
<2 Years	31	14	17	31%
2-5 Years	52	20	32	52%
>5 Years	17	11	06	17%

Table 4. Duration of Illness

Frequency of Symptoms	No. of Patients	No. of Males	No. of Females	%
Less than 2 times weekly	48	29	19	48%
More than 2 times weekly but less than once daily	19	07	12	19%
More than once daily with nocturnal symptoms	33	9	24	33%

Table 5. Frequency of Symptoms

Diurnal Variation	No. of Males	No. of Females	Total
Present	28	38	66
Absent	17	17	34

Table 6. Diurnal Variation

Time of Attack	No. of Patients	%	Males	Females
Early morning	24	24%	08	16
During the daytime	12	12%	06	06
Evening	08	8%	04	04
Night	38	38%	16	22
Any time	18	18%	11	07

Table 7. Time of Episode of Bronchial Asthma

Symptom	Males	Females	Total n=100
Dyspnoea	39	49	88%
Wheezy Chest	40	42	82%
Chest Tightness	27	36	63%
Cough	11	18	29%

Table 8. Symptoms

Season of Attacks	Males	Females	Total
Winter Months	27	32	59
Summer Months	03	06	09
Rainy Season	09	09	18
Perennial	06	08	14

Table 9. Season of Episodes

Reversibility	No. of Patients	Males	Females	Percentage
<12% FEV1	87	40	47	87%
>12% FEV1%	13	05	08	13%

Table 10. Assessment of Reversibility of Airway Obstruction at the Time of Diagnosis

Severity	Total No.	Percentage	Male	Female
Normal FEV1>80%	0	0	0	0
Mild FEV1 60-80%	21	21%	8	13
Moderate 40-60%	33	33%	14	19
Severe <40%	46	46%	23	23

Table 11. Severity of Airway Obstruction at the Time of Enrolment

FEV1	Admission	At the End of 1 st Week	2 nd Week	3 rd Week	4 th Week
>80% of Predicted	0	8	12	21	26
60 to 80%	21%	30	36	48	54
40-60%	33%	32	34	15	8
<40%	44%	30	18	16	12

Table 12. Response to Treatment

Type of Control of Asthma	No. of Patients	Percentage
Intermittent	16	16%
Mild Persistent Episodes <twice weekly and no nocturnal symptoms	64	64%
Moderate Persistent >twice weekly but less than once daily with nocturnal symptoms	08	08%
Severe Persistent - daily and nocturnal symptoms and	12	12%

Table 13. Level of Control of Asthma at the End of 4 Weeks of Treatment: n=100

DISCUSSION

The overall burden of Asthma in India is estimated at more than 15 million. In different studies gender preponderance was variable. In our study there is a female preponderance. Anuradha study showed male predominance. In their study cough variant asthma was seen in 50%, nocturnal asthma in 17.5%, allergic asthma in 20.8% and occupational asthma in 10.8%. 59% of the patients showed family history of asthma. Cough variant asthma in our study is present in 29% of patients. In our study family history of bronchial asthma was present in 52%. The study suggested that the patient should be aware of the triggering and aggravating factors.⁴ Akimbani LJ et al study in United states showed a higher outpatient visits among males but emergency department visits and hospitalization visits were the same for both males and females.⁵ As per an American study the incidence of asthma is more among boys in child hood. In the 15 to 50 years age group more common among females and reverses again after 50 years of age.⁶ A. N. Agarwal study showed a prevalence of asthma of 2.38% in the general population. The figure is lower than the previous studies, but the study suggested that asthma disease burden is very high in India.⁷ Though our study did not measure the prevalence of asthma these studies indicate the importance of asthma in general practice and the importance of our study. According to Padmaja et al., Study prevalence of asthma is variable in different parts of the world because of interaction of genetic and environmental risk factors. According to this study maternal smoking, tobacco exposure, exposure to animals, childhood infections, occupational exposure to allergens play an important role in the development of asthma.⁸ According to Maria C study onset of asthma occurs predominantly in below 16 age group.⁹ In our study we have chosen patients of asthma of more than 18 years age group. Sarat Balaji study showed a prevalence asthma among school children amounted to 4.5%.¹⁰ According to a Singapore study there are ethnic differences in the prevalence of bronchial asthma among different communities that cannot be explained by exposure to risk factors and atopy. The prevalence of asthma depends on the interaction of genetic and environmental factors.¹¹ According to an Indian study published by Jindal et al., the prevalence of asthma in India is around 2.05% and advanced age, smoking, family history of asthma and unclean habits contributed to asthma.¹² Ruchi Shah et al., proposed that in childhood asthma is more prevalent among males and in adulthood more prevalent in women and hormone fluctuations alter the symptoms of asthma among women.¹³ Iris Koper et al., also agreed on gender differences of asthma.¹⁴ Be 'ne 'dicte Leynaert et al., proposed that non allergic asthma is more frequent in women than men and female sex is an independent risk factor for nonallergic asthma.¹⁵ Our study also showed female preponderance and history of allergy was seen in only 48% of the patients and 52% of patients did not have allergy history. We did not categorise the patients of asthma according to the phenotypes. One European study revealed asthma as a public health problem affecting 5-10% of population of all

ages.¹⁶ Alberto Papie et al., concluded that asthma results from complex environmental and genetic interactions and is an important chronic noncommunicable disease causing airway inflammation in both adults and children.¹⁷ In our study family history of asthma was present in only 52%. Asthma results from interaction of genetic and environmental factors and family history of asthma among and parents and siblings is an additive factor.¹⁸ In our study history of allergic rhinitis was seen in 39% but allergic rhinitis initiated asthma episodes in only 23%. Selvakumar study in children showed a history of rhinitis in 13.6% and sinusitis in 2% among asthmatic children.¹⁹

In our study asthma patients presented with cough, chest tightness, chest pain and breathlessness but more often with combination of symptoms. In middle aged adults, chest tightness should lead us to exclude coronary artery disease. According to the studies of Sheriff et al., asthma presents with dyspnoea as the commonest symptom followed by wheeze but may present with non-respiratory symptoms. Chest pain is an important symptom and it is necessary to exclude chest pain of cardiac aetiology.²⁰ 77% of our patients had their episodes in winter and rainy season. Only 9% had their episodes in summer. 14% of the patients presented with perennial symptoms. In a British study of Fleming predominant hospital admissions occurred in September and October months but deaths occurred more in November. In their study summer episodes were minimal. The observation is similar to our study.²¹

62% of our patients presented with nocturnal and early morning symptoms and 18% had episode any time during the day or night. Neil J Douglas stressed the importance of nocturnal asthma as a symptom of severity that affects sleep.²² In our study despite inhalation therapy 12% of patients continued to have their FEV1 below 40% of predicted. Probably they belong to asthma COPD overlap group. Rodolfo M. et al., studied about the irreversible component of asthma that occurs as the frequency of attacks increases. They studied about the irreversible component of asthma that occurs as the frequency of attacks increases and this irreversible component can occur in early life.²³ Asthma is a complex disease identifying and studying the genotypes and correlating with phenotypes can help in the study of epidemiology of asthma. Sputum differential count and exhaled nitric oxide can help in categorizing asthma.²⁴

CONCLUSIONS

Bronchial asthma is a complex disease occurring because of environmental and genetic factors. The disease presents with cough, dyspnoea, chest tightness and wheeze of variable severity. Family history is not present in all the patients. Gender predominance is different in different studies. Predominant number of patients gave a history of attacks of less than five years duration. Nocturnal and early morning asthma occurred in a predominant number of patients in our study. Winter and rainy season attacks occurred in more than three fourths of our patients and 14% of patients had perennial attacks. 80% of the patients had

more than 60% FEV1 and improved symptoms after four weeks of bronchodilator therapy. 12% continued to have less than 40% FEV1 after 4 weeks of therapy.

Limitations

Study is conducted among only one hundred patients and as such the sample size is small. Pulmonary function results varied with the ability of the patient to cooperate and follow the instructions and the patience of the technician. History is sometimes inadequate because of poor education and awareness on the part of the patients. Inhalation technique of usage of MDIs were defective among our patients despite proper instructions.

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