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"IS IT BRONCHIAL ASTHMA OR EOSINOPHILIA-THINK BEFORE YOU TREAT."

Clinical Research

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ABSTRACT

Common respiratory symptoms of various respiratory disorders many a times cause diagnostic dilemma to the treating physician leading to misdiagnosis and maltreatment of patients. Purpose of this study was to differentiate bronchial asthma and transient eosinophilic conditions.

Objective- Objectives of this study were to distinguish bronchial Asthma from eosinophilia and to assess mal-treatment with inhaled corticosteroids.

Material and Methods- A prospective observational study was conducted over a period of three years (September 2013 to September 2016) at King George's Medical University, Lucknow, India. Patients attending out-patient services at department of Respiratory medicine from various government and private health set-ups were enrolled for the study. A total of 1000 subjects who were labeled as bronchial asthma from different sources were enrolled comprising of 464(46.4%) male and 536(53.6%) female patients. The data was analyzed using chi-square test. Statistical Package for Social Sciences (SPSS) version 23.0 was applied.

Results- 244 (24.4%) subjects consisting of 148(14.8%) male and 96(9.6%) female patients were found to be wrongly labeled as bronchial asthma and inhalers were stopped however 23(9.43%) patients including 14 females and 9 males had relapse in their symptoms and were restarted on inhalers, rest of the 221 patients remained symptom free at 12 months of follow up.

Conclusion- In view of findings of this study it was observed that almost one fourth of the patients who were patients of transient eosinophilic condition were misdiagnosed as bronchial asthma and were on unnecessary inhalational treatment.

KEYWORDS

Bronchial Asthma; Eosinophilia; Inhalers

INTRODUCTION

Bronchial asthma is currently described as a heterogeneous disease, usually characterized by chronic airway inflammation. It is defined by the history of respiratory symptoms such as wheeze, shortness of breath, chest tightness and cough that vary over time and intensity, together with variable expiratory airflow limitation. Asthma mostly has its onset in early years of life, often there is presence of positive family history, a sensitizing agent/agents, history of allergic rhinitis and sinusitis or some skin allergy can be there, presence of symptom free intervals and seasonal variation. Diagnosis is based on identifying a characteristic pattern of respiratory symptoms and variable expiratory airflow limitation(1). Patient with symptoms should be dealt with careful and detailed history and clinical examination and should undergo spirometry with reversibility/PEF followed by proper treatment. Coming to Eosinophilia which refers to increase in number of eosinophils in blood occurring in response to some parasites, drugs and allergens or sometimes in some cases of leukemia. Mostly it is a transient condition with a short history and treatment of the underlying cause or cessation of the offending agent will give relief to the patient. Coming to the present study, sometimes there is a diagnostic dilemma between the two as the respiratory symptoms and clinical findings are almost similar many a times and in the absence of proper history and examination by unqualified physicians, quacks or even sometimes by qualified doctors the patients of eosinophilia are treated as bronchial asthma and they take inhalational therapy for years together which is most of the times not needed, along with it they live with the stigma of suffering from a chronic disease.

Material and Methods

1000 patients (464 males and 536 females) labeled as bronchial asthma and were on inhaled corticosteroids advised from various government and private set ups were evaluated and followed up during the study from September 2013 to September 2016 at department of respiratory medicine, King George's Medical University, Lucknow, India. The evaluation was based on thorough history and physical examination, their previous records, investigations including hemogram, absolute eosinophil counts (AEC), total serum Immunoglobulin E (IgE), chest skiagram and spirometry with reversibility(0,3,6&12 months) after following proper protocol. Only non smoker patients were included in the study to eliminate bias due to smoking. Patients less than 5 years of age, chronic obstructive pulmonary disease (COPD), Allergic Broncho Pulmonary Aspergillosis (ABPA), Interstitial lung disease (ILD), pneumonia and other chronic respiratory causes of breathlessness were not included in the study. Mean Absolute Eosinophil counts was taken as 1500/ul. for labelling eosinophilia. Total serum IgE mean value was taken as 400 IU/L for allergic asthmatic patients. The data was analyzed using chi-square test. Statistical Package for Social Sciences (SPSS) version 23.0 was applied. p value <0.05 indicated a statistically significant association.

Observation and Results

The study included 1000 patients including 464(46.4%) males and 536(53.6%) females. Out of 1000 patients 648(64.8%) patients were started on inhalers by allopathic doctors with post graduate degree/diploma(546 private and 102 Government) however only 196(19.6%) patients out of these were actually seen by chest physicians, 349(34.9%) patients were seen by M.B.B.S doctors(293 private,56 Government) , 3(0.3%) patients were seen by private homeopathic doctors. Only 128(12.8%) patients (74 males and 54 females) were started on inhaled treatment after following proper protocol i.e relevant investigations and Spirometry with pre and post bronchodilator this indicated that use of spirometry was highly underutilized. All patients were thoroughly evaluated again with careful history and physical examination, their previous records, investigations including hemogram, absolute eosinophil counts, total serum IgE, Chest skiagram and spirometry with reversibility (after withholding SABA for 4-12 hours, LABA for > 12 hours and inhaled corticosteroids for 24 hours or more). Patients taken into account for alternative diagnosis were those who gave history of symptoms of short duration or of passage of worms in stool, no significant symptoms in earlier years of life, no positive family history, no clinical signs and symptoms and having no obstruction or mixed pattern suggested by their spirometry. Ultimately 244(24.4%) patients including 148 males and 96 females were found to be to be wrongly

labeled as bronchial asthma and were advised to stop inhalers for 3 months however they were asked to report back if they suffer from any symptoms, 23(9.43%) patients out of 244 including 14 females and 9 males suffered from respiratory symptoms especially night time cough though the spirometry performed by them prior to stopping the inhaled treatment was not suggestive of obstructive disease but the repeat spirometry suggested variable expiratory airflow limitation and were advised to restart inhalational therapy.221(22.1%)patients didn't required inhalers and were symptom free at subsequent follow ups till 12 months.

Tables

Table 1- Patients started on Inhalers by various practitioners

	Government set up	Private set up
Initiated by MD/Diploma	102	546
By M.B.B.S	56	293
By B.H.M.S/Others	00	3

The data analyzed in table 1 suggested that higher proportion of patients started from private set ups however it was statistically not significant (p=0.707)

Table 2-Status of spirometry before initiation of inhalers

	Males	Females	Total
Spirometry done	74	54	128
Not done	390	482	872

The data analyzed in table 2 suggested that significantly higher proportion of males (74/390; 19.0%) as compared to females (54/536; 10.1%) underwent spirometry (p=0.006).

Table 3- Patients status of diagnosis after reevaluation during the study

	Males	Females	Total
Patients diagnosed as Asthma	316	440	756
As Eosinophilia	148	96	244

The data analyzed in table 3 suggested that significantly higher proportion of females as compared to males were diagnosed as bronchial asthma (p<0.001)

Table 4-Status of patients on follow up at 12 months

	Males	Females	Total
Restarted on inhalers	9	14	23
Didn't required inhalers	139	82	221

The data analyzed in table 4 suggested that almost one fourth of patients did well even after six months of stopping the inhalers.

Discussion

Bronchial Asthma is a common and serious chronic disease which causes respiratory symptoms, activity limitation and imposes burden on patients and community. The symptoms vary over time in their occurrence, frequency and intensity, the symptoms are associated with variable expiratory airflow limitation. Viral infections, allergens like house dust mites, pollens, tobacco smoke, stress , exercise and few drugs like aspirin are well known triggers for asthma and its flare ups. Patient with symptoms should be dealt with careful and detailed history and clinical examination and should undergo spirometry with reversibility/PEF followed by proper treatment particularly with inhaled corticosteroids which reduces the frequency and severity of symptoms as well as take care of flare ups. Reversibility refers to rapid improvements in FEV1(or PEF) measured within minutes after inhalation of rapid acting bronchodilator such as 200-400mcg Salbutamol (*2*) .This condition can affect at all levels of society but if it is properly controlled people can live with this condition actively and successfully. A patient suffering from respiratory symptoms with evidence of variable expiratory airflow limitation (*1*) such as FeV1 increased by more than 12% and 200 ml after inhaling a bronchodilator, average daily diurnal PEF variability is >10% or FeV1 increased by more than 12% and 200 ml from baseline after 4 weeks of anti-inflammatory treatment supports the diagnosis.. Patient who is on treatment should be assessed for asthma control considering his/her day time symptoms, night waking, any need for reliever and limitation of activity. Patients who are having poor control of asthma have greater variability in lung function(*3*). Testing of lung function should be carried out by trained personnel and with calibrated and well maintained equipment (*1,4*). Cough variant asthma must be differentiated from eosinophilic bronchitis in which the latter has sputum eosinophils but normal spirometry and airway hyper-responsiveness(*5*). Asthma related to occupational exposures should be carefully evaluated. An estimated 5-20% new cases can be occupation related and are frequently missed(*6*). For many patients dealt in primary care the diagnosis cannot be confirmed (25-35%) and if the basis of diagnosis has not been documented previously, confirmation with objective testing should be sought(*7-10*).. Many a times Asthma is being wrongly diagnosed in patients of Eosinophilia which may present with similar symptoms however the duration of illness is much shorter. Coming to the background eosinophils are leukocytes derived from bone marrow and are controlled by several cytokines with Interleukin-5 being the major determinant. Eosinophils can be elevated in blood and tissues in a wide variety of disease processes that include infections, allergies, malignancies, hematological disorders and other less common entities(*11-13*) however the most commonly associated cause is parasitic infestation by multicellular helminths(worms) (*13-15*). The degree of eosinophilia is determined by development, migration and distribution of the parasite within the host as well as host's immune response. Clinical history, findings and geographical exposures to infections aid in evaluation of etiology.All patients should be asked for medications which can be a common cause for persistent eosinophilia where worms infestation is uncommon(*14*).Drugs like sulfasalazine, penicillamine, allopurinol, carbamazepine, quinine, NSAIDS, nitrofurantoin and others can cause eosinophilia and the presentation can range from being asymptomatic to drug reaction with eosinophilia and systemic symptoms(DRESS)(*16-18*). In allergic rhinitis, non allergic rhinitis with eosinophilia syndrome(NARES) or even in asthma(both allergic and non allergic) despite respiratory tract eosinophil infiltration blood eosinophils rarely exceeds 1500/ul. Aaron SD et al study in Canadian citizens suggested that one third of obese and non-obese individuals with physician diagnosed asthma were not having the disease on objective assessment(*7*),Lucas AE et al included patients referred to a diagnostic care centre during 6 months who used ICS without a clear indication and found 11% of patients using ICS successfully ceased using it(*8*). Marklund B et al studied estimates about wrong diagnosis and found that only 51(59%) patients out of 86 patients included in study had asthma(*9*). Montnemery P et al did a study in the primary health care units of municipality of Lund and concluded that General practitioners were good at excluding asthma with specificity of 0.99 but less good in diagnosing the actual asthmatics with sensitivity of 0.59(*10*).

Conclusions

Few relevant conclusions were drawn from the study like in our country eosinophilia is notably underreported due to lack of diagnostic facilities and lab errors and can mimic symptoms of bronchial asthma so one should use clinical acumen with detailed history to rule out temporary causes of similar symptoms before labeling a patient as asthma because eosinophilia actually requires treatment of the underlying cause which in many cases can be worm infestations or just cessation of the offending agent, many a times it can also be self limiting. it was observed that almost one fourth of the patients who were patients of transient eosinophilic condition were misdiagnosed as bronchial asthma and were on unnecessary inhalational treatment with the stigma of suffering from a chronic disease. In our study 221 patients out of 244 did well without inhalers even at 12 months of follow up and was further confirmed with repeat spirometry at follow ups. It was also observed that use of Spirometry was highly underutilized both at the private as well as government establishments and many of the patients were being treated under inexperienced hands.

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Conflict of Interest

There are no conflicts of interest to disclose.

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