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Medicine

Prevalence of Allergic Bronchopulmonary Aspergillosis (ABPA) in Patients of Bronchial Asthma in Punjab

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Abstract: True prevalence of ABPA among asthmatics is not known, may be attributed to the lack of a uniform diagnostic criterion and standard tests. To determine the prevalence of ABPA in bronchial asthma. All patients of bronchial asthma from January 2012 to September 2015 were evaluated and diagnosis of ABPA was made according to criteria laid down by Rosenberg et al. 479 patients completed the study. 40.9% patients of bronchial asthma who had AEC of > 1000 along with radiological abnormalities were further investigated for ABPA with non specific IgE levels >1000ng/ml, elevated levels of IgG and IgE specific for Aspergillosis and HRCT chest. IgE levels of > 1000ng/ml was detected in 38.7%, IgG-Af was positive in 30.6%, IgE-Af was positive in 31.6% of patients and both IgE-Af and IgG-Af were positive in 28.6% patients. HRCT chest was done only in 36.2% patients due to economic constrains. Central bronchiectasis was detected in 73.2%, homogeneous shadows (fleeting infiltrates) in 91.5%, parallel line shadows in 54.9% ring shadows in 32.4%, honey comb shadows in 22.5%, tramline Shadows in 19.7%, atelectasis in 26.8% and cavitation was seen in 15.5% of patients. 14.2 % patients of bronchial asthma had ABPA diagnosed on basis of presence of at least five of the eight major criteria described above. Interestingly 67.6% of these patients diagnosed as ABPA were misdiagnosed as pulmonary tuberculosis, and were on anti tuberculosis treatment. Results of our study conclude that ABPA is under diagnosed inspite of its relatively high prevalence.

Keywords: bronchial asthma, pulmonary tuberculosis, Aspergillosis.

INTRODUCTION

Prevalence of Bronchial asthma is increasing worldwide making it a global health problem including in India [1], where an epidemiological study reported the prevalence of self-reported asthma to be 1.8% in men and 1.9% in women [2]. Allergic Bronchopulmonary Aspergillosis (ABPA) is a hypersensitivity reaction to *Aspergillus* mycelia colonizing the bronchi and is commonly associated with asthma. ABPA is an important cause for complicated course and poor control of asthma. A. fumigates colonizes in airways lead to IgE sensitization, eosinophilic airway inflammation and reduced lung function [3]. ABPA is being increasingly reported from India, but its true community prevalence of ABPA is still unknown especially among asthmatics, may be because of lack of a uniform diagnostic criterion and standard tests [4]. Western studies document 1-6% prevalence of ABPA in chronic cases of asthma [5]. ABPA is not uncommon in India as various studies found 16% [6], 7.5% [7] and 27.2% [8] prevalence of ABPA in patients of asthma. These prevalence figures may be an overestimate of the actual prevalence of ABPA due to the selection bias of the subjects to the tertiary care centres. But APBA is still under diagnosed in India, and almost half of the cases are initially misdiagnosed as pulmonary tuberculosis [8]. The present study was conducted to determine the prevalence of ABPA in asthmatics patients in Punjab.

Aims and Objectives

To determine the prevalence of ABPA in patients of bronchial asthma.

MATERIALS AND METHODS

Consecutive patients above the age of 20 years with clinical diagnosis of bronchial asthma being managed in outpatient department from January 2012 to September 2015 were evaluated. The exclusion criterion was pregnancy and the use of systemic corticosteroids for more than 5 days in the preceding 6 weeks. Demographic characteristics were noted and detailed clinical evaluation was performed. X ray chest and absolute eosinophil count (AEC) was done in all patients and those patients with suspicion of ABPA were further investigated by HRCT chest (optional), serum titers of non specific IgE, specific IgG and IgE against A. fumigates. Diagnosis of ABPA was made with at least five major criteria out of eight major criteria laid down by Rosenberg *et al*., [9] which included (1) history of bronchial asthma; (2) peripheral blood eosinophil (>1000 cells/ml); (3) Type I cutaneous reactivity to A. fumigatus antigen; (4) Elevated total serum IgE level ≥1000 IU/mL (5) fleeting or fixed radiological opacities; (6) raised specific serum IgG against A. fumigatus; (7) raised specific serum IgE against A. fumigatus; (8) HRCT thorax showing proximal bronchiectasis. Four Hundred and seventy nine patients completed the study.

RESULTS

Four Hundred and seventy nine patients with a clinical diagnosis of bronchial asthma were screened during the study. There were 59.1% (283) males and 40.1% (196) females in the study population. Table below shows characteristics of patients of bronchial asthma.

Table: Characteristics of Bronchial Asthma Patients % (n-479)

S. No	Findings	Characteristics	Total n-479	Males n-283	Females n-196
1.	**Clinical Profile (n-479)**	Breathlessness	100 (479)	100(283)	100(196)
		Wheezing	100 (479)	100(283)	100(196)
		Cough	66.8 (320)	69.9(198)	62.2(122)
		Expectoration	21.9 (105)	25.0(71)	17.3(34)
		Other allergic illnesses	33.8 (162)	27.6(78)	42.8(84)
2.	**Absolute Eosinophil count (n-479)**	<500	32.8 (157)	38.2(108)	25(49)
		500 – 999	26.3 (126)	34.4(89)	18.9(37)
		1000- 1499	28.8 (138)	25.8(73)	33.2(65)
		1500- 1999	8.6 (41)	10.2(29)	6.1(12)
		≥ 2000	3.5 (17)	3.2(9)	4.1(8)
3.	**X ray Chest PA (n-479)**	Normal	81.8 (392)	87.8(249)	72.9(143)
		Fleeting shadows	7.9 (38)	6.4(18)	10.2(20)
		Ring shadows	2.7 (13)	3.2(9)	2.1(4)
		Tramline shadows	2.4 (11)	1.7(5)	3.1(6)
		Increased BV markings	5.2 (25)	4.9(14)	5.6(11)
4.	**IgE (n-196)**	IgE > 1000ng/ml	38.7(76),	20.9(41)	17.9(35)
		IgG-Af	30.6(60),	16.3(32)	14.3(28)
		IgE-Af	31.6(62)	19.4(38)	12.2(24)
		IgE-Af and IgG-Af	28.6(56)	15.3(30)	13.3(26)
5.	**HRCT Chest (n-71)**	Central bronchiectasis	73.2(52)	49.2(35)	23.9(17)
		Homogeneous shadows (fleeting infiltrates)	91.5(65)	59.1(42)	32.3(23)
		Parallel line shadows	54.9(39)	39.4(28)	15.5(11)
		Ring shadows	32.4(23)	16.9(12)	15.5(11)
		Honey comb	22.5(16)	12.6(9)	9.8(7)
		Tramline Shadows	19.7(14)	9.8(7)	9.8(7)
		Atelectasis	26.8(19)	14.1(10)	12.6(9)
		Cavitation	15.5(11)	8.5(6)	7.1(5)

40.9% (196/479) patients of bronchial asthma who had AEC of > 1000 along with radiological abnormalities on X ray chest were further investigated for prevalence of ABPA with non specific IgE levels >1000ng/ml, elevated levels of IgG and IgE specific for aspergillosis and HRCT chest. IgE levels of > 1000ng/ml was detected in 38.7% (76/196), IgG-Af was positive in 30.6% (60/196), IgE-Af was positive in 31.6% (62/196) of patients and both IgE-Af and IgG-Af were positive in 28.6% (56/196) patients. HRCT chest

was done only in 36.2% (71/196) patients due to economic constrains. Central bronchiectasis was detected in 73.2% (52/71), homogeneous shadows (fleeting infiltrates) in 91.5% (65/71), parallel line shadows in 54.9% (39/71), ring shadows in 32.4% (23/71), honey coomb shadows (pulmonary fibrosis) in 22.5% (16/71), tramline Shadows in 19.7% (14/71), atelectasis in 26.8% (19/71) and cavitation was seen in 15.5% (11/71) of patients. All the characteristics were almost the same in males and females. 14.2 % (68/479) patients of bronchial asthma had ABPA diagnosed on basis of presence of at least five of the eight major criteria described above. Interestingly 23.5% (16/68) of ABPA patients were misdiagnosed as suspected pulmonary tuberculosis (sputum negative), and were on anti tuberculosis treatment.

DISCUSSION

The results of our study suggest that prevalence of ABPA in patients of bronchial asthma was 14.2%. In a study, the prevalence of ABPA was 21.7% and generally, the prevalence of ABPA is thought to be 1–2% in patients in patients of asthma [10]. ABPA is being increasingly recognized now and the estimated prevalence rates have been reported to be ranging from 5.9% to 20.5% for ABPA in different studies [11, 12]. Prevalence data from this part of the country are sparse. Prasad *et al.*, reported a prevalence of 7.4% for ABPA in a study [13]. The true population prevalence of ABPA remains unknown, but high prevalence rates have been reported from dedicated pulmonary medicine clinics. Higher prevalence rates in these studies are probably a reflection of referral bias as most of these studies are from tertiary care settings. The diagnostic criteria for ABPA had been a subject of debate and the method of screening patients with asthma also has evolved overtime. This is the reason for variable prevalence rates of ABPA reported in the literature. Aspergillus skin test had been used for screening the patients with bronchial asthma for Aspergillus Hypersensitivity (AH) and ABPA till Aggarwal et al in 2013 [14] proposed that specific IgE for A fumigates should be screening modality of choice in their revised diagnostic criteria. Although estimation of specific IgE against A. fumigates is more sensitive [15] and its use for screening is justified, it is also possible that patients colonized with other Aspergillus spp. might be overlooked leading to under diagnosis. Limitation of our study is that we did not conduct the skin prick test for cutaneous reactivity to A. fumigatus antigen and differentiate to AH and ABPA.

CONCLUSIONS

The prevalence of ABPA in patients with bronchial asthma in our study was 14.2% which is comparable to the prevalence documented by previously published studies. More importantly a large number of ABPA patients are being misdiagnosis with TB and continued on antitubercular treatment. Although routine screening for ABPA in patients with asthma is not recommended in field setting a high index of suspicion should be kept while evaluating patients with bronchial asthma. Efforts need to be intensified to improve the awareness level about this disease, among general physicians to prevent irreversible lung damage and misuse of on antitubercular treatment.

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