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FUNGAL PROFILE IN ALLERGIC BRONCHOPULMONARY MYCOSIS

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ABSTRACT **Background:** Allergic bronchopulmonary mycosis (ABPM) is a clinical syndrome associated with immune sensitivity to various fungi notably Aspergillus spp. that colonize the airways of asthmatics. Early diagnosis and treatment with systemic corticosteroids is the key in preventing the progression of the disease to irreversible lung fibrosis. **AIMS:** To study the occurrence,clinical and etiology of ABPM in patients attending a chest clinic of a tertiary hospital. **MATERIAL AND METHODS:** Induced sputum and BAL fluid samples were collected and subjected to KOH mount and culture. Serum samples were collected and specific IgE levels are determined. **RESULTS:** 100 suspected patients evaluated in which BAL fluid samples were found to be more sensitive than induced sputum. Culture found to be more sensitive than KOH mount.Specific IgE to culture positive Aspergillus fumigatus and Candida patients was positive in 11 cases and 5 cases respectively. **CONCLUSION:** Since asthma is a common disease, clinicians need to maintain a high index of suspicion for ABPM and keep in mind its diverse manifestations.

KEYWORDS :

INTRODUCTION:

Allergic bronchopulmonary mycosis (ABPM) is a hypersensitivity mediated disease of the lower airways with a worldwide distribution. Although Aspergillus fumigatus is the most common etiologic agent, The criteria for diagnosis of ABPM are essentially the same as proposed for allergic bronchopulmonary aspergillosis (ABPA) by Rosenberg et al[1] .The primary criteria include: episodes of bronchial obstruction (asthma), blood eosinophilia (1000/mm 3), type I cutaneous hypersensitivity to antigens of the etiologic fungus, serum precipitins against the offending fungal antigens, elevated total serum IgE (1000 IU/ml), elevated IgE/IgG antibodies specific to the etiologic fungus and a history of pulmonary infiltrates (transient or fixed) or central bronchiectasis on chest CT scans. The secondary diagnostic criteria include : demonstration of the etiologic fungus in sputum/bronchial aspirate by microscopy and culture, history of expectoration of mucus plugs or flecks and an Arthus reaction (type III hypersensitivity) to the fungal antigens.

Because of indolent nature of the disease, a high index of suspicion is required for an early diagnosis of ABPM. This early diagnosis and subsequent treatment with corticosteroids is the key in preventing the progression of the disease. Increase awareness about this condition among physicians can lead to the diagnosis of this potentially crippling disease at a sufficiently early stage when treatment can save patients from succumbing to end stage lung disease[2].

AIMS AND OBJECTIVE:

1. To study fungal profile in cases of Allergic Bronchopulmonary Mycosis.
2. Compare sensitivity of induced sputum and Broncho Alveolar Lavage(BAL) fluid in isolation of fungi.
3. Compare sensitivity of Direct KOH wet mount and culture in isolation of fungi.
4. Identify most common fungi causing ABPM

MATERIAL AND METHODS:

The study was conducted in Government General Chest Hospital,Hyderabad, a Teritiary care centre for a period of One year. The study group comprised of 100 clinically suspected ABPM of all ages.

SPECIMEN:

1. Induced sputum and Broncheoalveolar lavage fluid samples (one each) from patients suspected of ABPM attending out-patient or admitted in Government General and Chest Hospital.

2. Serum samples were collected to determine specific IgE levels.

Methods:

MICROSCOPY:

1. GRAM STAIN
2. KOH MOUNT

CULTURE:

Samples were inoculated on following media:

1.SDA(Sabourads Dextrose Agar) plain
2.SDA with Chloramphenicol(SDAC)
3.PDA with chloramphenicol(PDAC)

And were incubated in BOD incubator for 3 weeks.

LACTOPHENOL COTTON BLUE

GERM TUBE TEST RESULTS

Total number of cases included in the study during one year period was 100. Out of these,76 were male and 24 female. Most common clinical condition in patients with allergic Bronchopulmonary symptoms had association with Asthma which was seen in 50 cases followed by mass lesions seen in 30 cases then 20 cases had bronchiectasis.

Out of 100 BAL fluid samples cultured on PDA, 43 were sterile and fungi was isolated in 57 samples.

Out of 100 induced sputum samples cultured on PDA , fungi was isolated in 64 samples while 36 were sterile.

Out of 100 BAL fluid samples cultured on SDA , fungi isolated in 52 cases while 48 were sterile.

Out of 100 induced sputum samples cultured on SDA, fungi isolated in 50 samples while 50 were sterile

Table-1

COMPARING THE SENSITIVITY OF INDUCED SPUTUM AND BRONCHOALVEOLAR LAVAGE IN ISOLATION OF FUNGI IN PDA WITH CHLORAMPHENICOL

	BAL	INDUCED SPUTUM
Candida species	14	45
Aspergillus niger	08	03
Aspergillus fumigatus	28	16
Aspergillus flavus	07	00
Total	57	64

- Aspergillus fumigatus is the most common fungus isolated.
- BAL fluid was more sensitive than induced sputum for isolation

Table-2 COMPARING THE SENSITIVITY OF BAL FLUID AND INDUCED SPUTUM IN ISOLATION OF FUNGI IN SDA WITH CHLORAMPHENICOL:

	BAL	INDUCED SPUTUM
Candida species	9	32
Aspergillus niger	9	2
Aspergillus fumigatus	25	7
Aspergillus flavus	7	7
Aspergillus niger + Aspergillus fumigatus	2	0
Candida species + Aspergillus fumigatus	0	2
Total	52	50

Table-3 COMPARING SENSITIVITY BETWEEN KOH AND CULTURE (n=100)

	KOH	CULTURE (PDA)	CULTURE (SDA)
BAL	12	57	52
INDUCED SPUTUM	12	64	50

Above findings shows Culture more sensitive than KOH

SPECIFIC IgE :
It was positive (>0.35kUA/L) in 25 casesAspergilllus fumigatus and 7 cases of Candida albicans.

DISCUSSION:
Till date, no comprehensive diagnostic criteria have been firmly established for ABPM. The most commonly accepted diagnostic criteria for ABPA (and by extension ABPM) were proposed by Rosenberg et al[1]. in 1977.

In the present study, cases were selected based on diagnosis of asthma and bronchiectasis,mass lesions in lungs based on radiological findings.

In a study by Anirban Sarkar et al.,2 Sputum and/or bronchoalveolar lavage fluid was examined for fungal elements 2. In the present study also, in order to evaluate and compare sensitivity of BAL fluid and induced sputum, both samples were taken.

Total 57 isolates were identified from 100 BAL fluid samples in PDAC. 64 organisms were isolated from 100 induced sputum samples in PDAC and among these 64, only 33 were considered significant as rest of 31 were considered oropharyngeal colonizers

Total 52 organisms are isolated from 100 BAL fluid samples in SDAC and 50 organisms isolated from 100 induced sputum samples and among these 50 organisms, 27 were considered significant and rest of 23 considered oropharyngeal colonizers due to Candida species.

Therefore, from above findings BAL fluid samples were considered more reliable than induced sputum samples.

According to Catherine H. Pashley et al 4., both the choice of media and quantity of sputum inoculated onto the tested media have an effect on the detection of fungi from respiratory samples. this study highlights the fact that choice of media does make a difference and that SDA, used routinely in many clinical mycological laboratories, may result in the underestimation of the prevalence of A. fumigatus colonization4.

In the present study, 57 and 64 organisms were isolated from BAL fluid and induced sputum samples in PDAC, 52 and 50 organisms were isolated from BAL fluid and induced sputum samples in SDAC. Therefore PDAC has more growth of organisms than SDAC thus demonstrating that PDAC is found to be more sensitive than SDAC.

In the study by Anirban Sarkar, Abhijit Mukherjee et al[2]., in three out of six cases of ABPM where fungus was isolated from sputum, it was Candida sp. which represented oropharyngeal colonization as bronchoalveolar lavage (BAL) fluid did not grow any organism, In the present study also, maximum number of candida species isolated from induced sputum samples may represent oropharyngeal colonization as bronchoalveolar lavage did not grow as many candida organisms.

CONCLUSION
We conclude that candida albicans is the most common pathogen in cases of ABPM A.fumigatus being the next common and other fungi such as A.flavus, A.niger are also implicated as pathogens.

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