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An unusual fungal pathogen in invasive pulmonary disease in tuberculosis patients

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Abstract
Aspergillosis is a systemic fungal infections found both in immunocompromised as well as in immunocompetent individuals. Here we report 2 cases of fungal pathogen infected patients with an unusual Aspergillus species. The association of tuberculosis with A. Niger may enhance the morbidity and mortality of the patients due to its lethal outcome. Therefore fungal cultures also becomes mandate in a pneumonia patient sample and excluding rare species is a must in the current era of emerging and reemerging infections.

Keywords: Tuberculosis, Fungal, Aspergillus.

1. Introduction
Aspergillosis is a systemic fungal infections found both in immunocompromised as well as in immunocompetent individuals. They primarily cause pulmonary infections with involvement of other body sites as well as paranasal sinuses and cutaneous tissue. The genus Aspergillus consists of hundreds of species many of which can exploit a variety of substrates and both grow and reproduce within a wide range of environmental condition [1].

Aspergillus infections in humans were initially described in the 18th century. In 1729, Micheli named the fungus aspergillum – as it resembled brush or perforated globe used for sprinkling the holy water by priests. The first case of invasive disease was described in 1953 and since then there has been increasing recognition of invasive aspergillosis as an important factor of morbidity and mortality among patients with immunosuppression [2].

Here we report 2 cases of fungal pathogen infected patients with an unusual Aspergillus species.

Case 1
A 30 year old man presented with 3 months duration of productive cough, intermittent fever, haemoptysis and weight loss. He was diagnosed to have pulmonary tuberculosis 1 year back and had a complete course of ATT. He was a nonsmoker but addicted to alcohol. He was also a known case of pancreatitis with insulin dependent diabetes mellitus. Clinical examination showed the patient to be emaciated, afebrile, hemodynamically stable with clinical features suggestive of bilateral upper lobe cavitatory disease.

The lab investigation showed elevated ESR, CRP positive and HIV negative. Other parameters were normal including negative sputum by AFB staining. X ray chest showed – Irregular thick walled cavity upper lobe bilaterally with adjacent pleural thickening. The critical turning point was the growth in SDA.

Case 2
45/F, got admitted with H/O cough with expectoration of 6 months duration. The sputum was scanty and yellow in colour, foul smelling in nature. H/O haemoptysis was also present. Patient also gave H/O breathlessness on and off during exertion of 6 months duration associated with chest pain and fever which was aggravated at night. Patient gave a previous H/O having TB and treatment for 6 months. Clinical examination revealed the patient was afebrile. Bilateral crepitations in both lung field. The lab investigation showed lymphocytosis. Culture and sensitivity of sputum sample: moderate growth of Pseudomonas aeruginosa sensitive to Imipenem, Amikacin, Gentamycin, Cefotaxime, Ciprofloxacin and Ceftazidime.

CT showed right lower lobe fibrocavitary lesions with minimal ectatic changes and pleural thickening. The CT done on the patient was suggestive of infective aetiology, after which bronchoscopy was done and the bronchial wash was sent for AFB stain and fungal culture. AFB was negative but the fungal culture became positive with the growth of rare pulmonary fungal pathogen.

2. Results
In both cases the clinical samples when inoculated in SDA media grew Aspergillus Niger.

Macroscopically the obverse showed growth of flat, white, granular colonies covered with jet black conidia. In the reverse the colonies are colourless. Microscopically the hyphae are hyaline and septate. Conidiophores are smooth walled. Vesicles are spherical with biseriate phialides which bear abundant conidia in compact columns. Conidia are jet black and have echinulate walls. (Images 1&2)

Image 1

Image 2

3. Discussion

The Aspergillus consists of hundreds of species many of which can exploit a variety of substrates and both grow and reproduce within a wide range of environmental condition. A. fumigatus is an ubiquitous example and its airborne spores can cause respiratory allergies directly or give rise after germination to infection of respiratory tract [3]. A.flavus and A. terreus can also infect lungs. A. fumigatus and A.flavus are the most frequent species of Aspergillosis [4]. But lung infection due to Aspergillus niger is rare. Human beings are regularly exposed to those spores especially when there is decaying vegetation like mouldy hay in agriculture. It is also related to increased number of immunocompromised patients owing to improved survival in AIDS, malignancies and more intensive cytotoxic therapy and diabetes mellitus. Infections due to Aspergillus species cause significant mortality and morbidity and most are attributed to Aspergillus fumigatus, followed by A. flavus and A. terreus [5].

A broad range of disease caused by fungi of the genus Aspergillus includes the following: Aspergillus broncho pulmonary disease, colonisation of pulmonary cavity, indolent superficial infection of the skin and mucosal surfaces, chronic progressive pulmonary infection in mildly compromised patients and fulminant pulmonary infection with systemic dissemination in immunosuppressed patients [6]. Here we have 2 cases: one a 30 year old male and second 45 / female who had Aspergillus niger infection as proved by our lab investigation ,both cases are considered to have a compensated immunity due to the preexisting Tuberculosis infection, that is associated with decreased cell mediated immunity.

Another form of pulmonary Aspergillosis termed chronic necrotising pulmonary Aspergillosis or semi invasive pulmonary Aspergillosis, it is a locally progressive and destructive infection that occurs in mildly compromised patients who have underlying structural lung disease. This also supports our cases as they were proved pulmonary tuberculosis patients which enhanced an easy and supportive nidus for the fungus.

Chest radiography disclose parenchymal infiltrates and thick walled cavities, about 40% of which contain intracavitary fungus ball [5]. Our patients radiological imaging also had similar findings.

Invasive pulmonary Aspergillosis is a fulminant opportunistic infection that occurs almost exclusively in patients whose defence mechanisms are reversely compromised by malignancies, steroids, etc.

A search on the literature revealed 40 cases of pulmonary A. Niger colonization [3] and in this region of silk city of Tamilnadu this is the first report. The association of tuberculosis with A. Niger may enhance the morbidity and mortality of the patients due to its lethal outcome [3].

We report these 2 case studies for the rare species of Aspergillus producing lung infection and its association with morbidity and mortality.

4. Conclusion

Lung infections can not only be caused by bacteria but also by fungus specially in immune compensated patients. Therefore fungal cultures also becomes mandate in a pneumonia patient sample and excluding rare species is a must in the current era of emerging and reemerging infections .

5. References

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