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INVASIVE ASPERGILLOSIS-A CASE REPORT IN A TERTIARY CARE HOSPITAL

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Abstract

Invasive aspergillosis has increasingly been recognised to cause significant morbidity and mortality in immunocompromised patients. Fever unresponsive to broad-spectrum antibiotics is the earliest and most common sign of an invasive fungal infection. A 45 year old male presented with complains of breathlessness and cough. He was on treatment of corticosteroids. He was suffering from diarrhoea for 1 month. Ultrasound of abdomen was normal. Chest X-ray showed an emphymatous picture. Microscopic examination of sputum was found positive for tubercle bacilli and also revealed presence of branched septate hyphae. Direct microscopy of a 10% potassium hydroxide mount of repeated samples of sputum revealed dichotomously branched septate hyphae. Stool examination revealed mucoid stool with boluses of fungal elements. Stool sample and sputum samples were cultured on Sabourauds dextrose agar and speciation was done by microslide culture technique. Cultures of these samples yielded *A. flavus*. With this clinical picture, we strongly suspected an aggressive invasive fungal infection

Key words: *Invasive fungal infections, A. flavus*

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Introduction:

The incidence of invasive fungal infections (IFIs) has increased significantly over the past two decades, as the populations of patients at risk have continued to rise. IFIs are an important cause of morbidity and mortality among patients. Invasive aspergillosis is an increasingly common fungal infection that primarily affects severely immunocompromised patients.¹ The highlight of this case report is the finding of fungal hyphae in the direct microscopic examination of stools, which although unusual, may be a significant finding in an immunocompromised patient.

Case report:

A 45-year-old male, a chronic bidi smoker, presented with complains of breathlessness and cough for 5 years. He was on treatment from local practitioners and quacks. He was taking corticosteroid tablets on a regular basis for past 3 years in addition to bronchodilator tablets. During episodes of exacerbation he used to receive corticosteroid injections. He had complaints of abdominal pain with diarrhoea for last 1 month. He was taking drugs for 20 days for this problem with no description of drugs available. All routine investigations were done including Hemogram, urine Routine/Microscopic. Ultrasonography of

whole abdomen and chest X ray were also done. The complete blood count, KFT, LFT and urine examination were found to be normal. Ultrasound of abdomen was also normal. Chest X-ray showed an emphysematous picture. Microscopic examination of sputum was done by Ziehl Neelsen Staining and it was found positive for tubercle bacilli and also revealed presence of branched septate hyphae. Direct microscopy of a 10% potassium hydroxide mount of repeated samples of sputum revealed dichotomously branched septate hyphae. Stool examination revealed mucoid stool with 8-10 WBC/HPF and no entropathogenic bacteria. Stool sample and sputum samples were cultured on Sabourauds dextrose agar. Further speciation was done by microslide culture technique. Cultures of these samples yielded *A. flavus*. With this clinical picture, we strongly suspected an aggressive invasive fungal infection.

Fig: Aspergillus sps under 40 x power of microscope (LCB mount from culture on SDA)

Discussion:

In the past aspergillus was considered as a weak pathogen and cases of disease in immunocompetent host were regarded as scientific curiosity. More recently with increase in the number of immunosuppressed patients, aspergillus became the most common pathogenic mould worldwide.¹ As invasive *Aspergillus* infections are usually acquired by inhalation of *Aspergillus* conidia, symptoms of a pulmonary infection such as cough, rales and marked pleuritic chest pain can be noted early in the course, whereas hemoptysis typically comes late after neutrophil recovery. *Aspergillus* infections of the upper respiratory tract may also involve the nasal cavity or sinuses resulting in nasal obstruction, epistaxis, facial pain, periorbital swelling and even palate destruction.

Invasive gastrointestinal aspergillosis is a highly lethal and rapidly progressive opportunistic infection that characteristically affects the

immunocompromised host, resulting in high degree of morbidity and mortality.² *Aspergillus* species are ubiquitous fungi consistently documented as some of the most prevalent airborne molds. Conidia of *Aspergillus* species are often found in fireproofing or building material and are dispersed by ventilation systems into indoor air, including air within hospitals. Infection is usually initiated by inhalation of airborne conidia.³ The most common portal of entry is the respiratory system. *Aspergillus fumigatus* is the most prevalent fungal pathogen responsible for fatal invasive aspergillosis. In an immunosuppressed host, the infection may present as allergic sinusitis, bronchitis or localized pulmonary infection superimposed on underlying chronic lung disease. It is rarely a primary cutaneous lesion in immunocompetent patients.⁴ Risk factors for invasive aspergillosis are categorized into 5 major groups: 1) neutropenia, 2) hematopoietic stem cell transplantation, 3) solid organ transplantation, 4) AIDS, and 5) chronic granulomatous disease. Invasive aspergillosis is an increasingly common fungal infection that primarily affects severely immunocompromised patients, those receiving high-dose corticosteroids, or broad-spectrum antibiotics.⁵ The most common symptoms of invasive aspergillosis are non-specific and include: fever, chest pain, cough, malaise, weight loss and dyspnoea. However, approximately 41% of patients with invasive aspergillosis have no respiratory symptoms and corticosteroids treated patient frequently do not have elevated temperature.⁶ The continued use of antibiotics and subsequent use of steroids only worsened the disease course. Others emerging risk factors include use of corticosteroids even for short periods, COPD and cirrhosis of the liver.⁷ Most fungi are ubiquitous soil inhabitants and India, with its dusty atmosphere along with a warm and humid climate, offers an ideal environment for a wide variety of fungal infections. A high prevalence is expected in Indian hospitals where construction activities continue in the hospital vicinity without the use of any impervious barrier. *Aspergillus* infection is mainly acquired by inhalation. Invasive aspergillus infection mainly affects the lungs and sinuses.

Aspergillus is a saprophytic fungus that has rarely any adverse effect in immunocompetent individuals, since the inhaled conidia are eliminated relatively efficiently by innate immune mechanisms but can cause severe invasive infections in immunocompromised hosts.⁷ Invasive pulmonary aspergillosis accounts for 90-98% of invasive infections. Extra-pulmonary aspergillosis may be present in 25-60% of these cases. The respiratory tract is the most common site of involvement, and when the GIT is involved, it is most often in the form of a secondary dissemination. The most common portal of entry is the respiratory system.⁸ The major predisposing factors for development or progression to invasive aspergillosis are: deficiency of agglutinating surface surfactant proteins and C3, C5 complement factors, inhibition of anticonidial macrophageal activity, thrombocytopenia and neutropenia, low count of CD4 + T lymphocytes or failure to produce IL (interleukin)- 12, INF

(interferon) or TNF (tumour necrosis factor), prolonged antibiotic or steroids therapy.⁹⁻¹³

Conclusion:

Invasive aspergillus infections in adults are an increasing cause for mortality throughout the world. Invasive fungal infections commonly affect those who are immunocompromised, on immunosuppressive drugs or on broad spectrum antibiotics. Invasive aspergillosis has increasingly been recognised to cause significant morbidity and mortality in immunocompromised patients. Fever unresponsive to broad-spectrum antibiotics is the earliest and most common sign of an invasive fungal infection. The recognition of symptoms associated with invasive aspergillosis in patients at risk should prompt further diagnostic procedures, as an early diagnosis and immediate institution of antifungal therapy might improve the treatment outcome in this life-threatening condition.

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