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A Rare Case of Aspergillus Fumigatus Necrotizing Pneumonia in Immunocompetent Pediatric Patient

Dr. Kalpana. T. Suryavanshi

Microbiology Department, Bharati Vidyapeeth Medical College. Pune.
* Corresponding author

ABSTRACT

Aspergillus fumigates is a saprophytic mold, having potential to cause fatal infections in immunosuppressed & neutropenic patients. Pathologic sequalae is dependent on host human system & it is rare to see it in immunocompetent patients. Our rare case depicts necrotizing pneumonia in otherwise healthy pediatric patient. Patient was incompletely treated in other hospitals for unresolving pneumonia before referred to our hospital. Bronchosopy, aerobic culture of respiratory specimens could diagnose the rare case of Aspergillus fumigates necrotizing pneumonia but unfortunately we lost the patient to follow up.

KEYWORDS : Aspergillus fumigatus, Necrotizing pneumonia, Immunocompetent

INTRODUCTION:

Necrotizing pneumonia is a pulmonary infection characterized by progressive necrosis of lung parenchyma.[1] Most common etiological agent are Staphylococcus aureus, Streptococcus pneumoniae, Klebsiella pnueumoniae, Pseudomonas aeruginosa, Haemophilus influenza, Escherichia coli Acinetobacter baumannii, anaerobic pathogens, Fungi are less common etiology.[1]

Aspergillus species are reported but mostly from immunocompromised patients .We could find only, one report[2], along with report of Histoplasma capsulatum in immunocompetent patient. [1] Present report is rare report of necrotizing pneumonia due to Aspergilus fumigatus, in otherwise healthy child.

Aspergillus fumigatus is opportunistic mold, most commonly seen in neutropenic patients, & immunosuppressed patients on corticosteroids.[3] It is having affinity for pulmonary infection owing to small conidial size which bypasses upper respiratoy tract, easily lodging into lung.[4,5]

CASE REPORT:

14 Month old male child was presented to our Hospital for unresolving pneumonia. Child was treated outside during 1 month for persistent fever, cough, and breathlessness. His Chest X Ray showed gradually increasing infiltrates on right with minimal involvement of left side. He has received, IV Augmentin, IV Azithromycin, IV Meropenem, IV Linezolid, IV Fluconazole, Oral Azitromycin, Oral Cotrimoxazole, Oseltamivir. Despite treatment child's pneumonia worsened. C T scan was normal. Child was referred to our hospital for further management. Past history of patient was negative for occurrence of recurrent wheezing, repeated vomiting, regurgitation or foreign body aspiration or etiology explaining persistent pneumonia. No history of failure to thrive was noted.

On examination child was febrile 100^{0}F, Pulse rate 136/min, respiratory rate 46/minute, Blood sugar level-148 mg/dl. In Systemic examination Cardiovascular (CVS) & per abdomen (PA), showed nonspecific finding, Respiratory system revealed decreased air entry over right side. Bilateral wheeze was present. Central nervous system (CNS), examination revealed decreased tone, downgoing plantars.

In view of persistent unresolving pneumonia child was continued on O2 by nasal canula, IV meropenem, linezolid, fluconazole, along with nebulization for wheezing. Chest x ray showed increasing infiltrate as compared to previous chest x ray. Except Mild respiratory acidosis & anemia on haemogram other baseline findings were insignificant. Evaluation for pulmonary tuberculosis, i.e., Gastric lavage & Mantoux test were negative. On day 3 of admission wheezing increased, with progressively increased infiltrates on chest x ray. Child was on optimal bronchodilator therapy comprising of continuous nebulization, IV $MgSO_4$ IV Aminophylline infusion but respiratory acidosis was constant finding of Arterial blood gas analysis so child was intubated & put on mechanical ventilation. On day 4 of admission bronchoscopy was done which revealed secretions coming from right main bronchus with necrosis & ulceration at carina as well right segmental bronchi. Bronchoalveolar lavage was done but aerobic culture result showed no growth. In view of necrotizing pneumonia IV colistin & clindamycin were added &IV Fluconazole & linezolid was added. But repeat chest x ray showed worsing of pneumonia findings with involvement of left side also. On day 6 of admission to find the persistent etiology of pneumonia tracheal aspirate was sent for aerobic culture to microbiology laboratory, which was positive for Aspergillus fumigatus. Iv Voriconazole was added & amphotericin B was omitted. On day 7 of admission child developed tachycardia & increased peak inspiratory pressures, with further examination revealed decreased air entry on the left side. Needle insertion with underwater drain revealed pneumothorax. But child continued to have high grade fever so liposomal amphotericine b was added. On 10 day of picu child developed features of septic shock with cold peripheries & feeble pulse & required continuous fluid bolus & IV Dobutamine infusion. Blood culture was sent for evaluation of sepsis, which came positive for pseudomonas aeruginosa. So IV ciprofloxacin & cetazidime was added as per antibiotic susceptibility report. But repeat chest x ray showed frank ARDS like changes with bilateral homogenous lung opacities. Instead of need for prolonged ventilation & optimal antibiotic therapy child got discharged against medical advice.



Figur-1 Aspergillus fumigatus in Lactophenol cotton blue wet mount.

DISCUSSION:

Invasive fungal disease is one of the most fatal complications seen in immunosuppressed & neutropenic patients. (6, 7,9) Aspergillus fumigates is most frequent cause of invasive fungal disease. (5,6) About 20 of 200 aspergillus species are related to human disease. (6) Aspergillus fumigates is a mold belonging to family Trichocomaceae. (10) An asexual spore i.e. conidia enters in human body through inhalation & depending upon host human system pathogenic squeale develops. But in our case the patient was otherwise healthy.

Virulence factors aiding its survival in environment are as follows, thermotolerance, secretion of extracellular proteins, Nutritional scavenging, extensive secondary metabolites.[5] The smaller size of conidia 2-4 micrometer as compare to other spp of Aspergillus helps easy entry in pulmonary alveoli After escaping defense mechanisms like, alveolar macrophages & polymorphonuclear leucocyte platelets & pulmonary surfactants [4], conidia germinates under humid &warm condition.[6] It can infect almost any organ in the body. [10] Rare invasion in cerebrum is described by Gaurav et al[8], & by Nadkarni & Goel.

Delayed identification, posing problem in initiating appropriate antifungal therapy leads to life threatening infections as seen in our case too. Unfortunately as we lost the patient to follow up end result couldn't be documented. But patient with prolonged illness with long antibiotic treatment should always be assessed for fungal infections irrespective of their immunstatus.

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