The Professional Medical Journal
www.theprofesional.com

DOI: 10.29309/TPMJ/18.4554

CASE REPORT PROF-4554

ASPERGILLOSIS;
ALLERGIC BRONCHOPULMONARY ASPERGILLOSIS IN CHILDHOOD ASTHMA; A CASE REPORT

Javaria Rasheed[1], Rushan Hassan[2], Muhammad Khalid[3], Fauzia Zafar[4]

1. FCPS Pediatric Medicine
Senior Registrar
Pediatric Medicine Department Unit-1, Nishtar Hospital Multan.
2. Post Graduate Trainee,
Pediatric Medicine Department Unit-1, Nishtar University Hospital Multan.
3. FCPS Pediatric Medicine
Fellow Pediatric Infectious Diseases Department,
Aga Khan University Hospital Karachi.
4. FCPS, DCH, MCPS
Professor & Head
Department of Pediatric Medicine
Nishtar University Hospital Multan.

Correspondence Address:
Dr. Javaria Rasheed
Address: House No. 2, Street No.9, Income Tax Officer Colony, Multan.
jiyojiya@yahoo.com

Article received on:
02/12/2017
Accepted for publication:
30/03/2018
Received after proof reading:
02/06/2018

ABSTRACT… Allergic bronchopulmonary aspergillosis (ABPA) is an illness caused by hypersensitivity to colonized Aspergillus fumigatus, mostly involving susceptible adult patients with history of asthma and cystic fibrosis. Timely given appropriate treatment can reduce clinical symptoms, decrease lung infiltrates and stop progression to chronic lung disease. In literature review, treatment strategies used in ABPA children are limited. Herein we present a case of 10-year old asthmatic girl who, on developing ABPA, was successfully treated by the use of low dose corticosteroids combined with itraconazole for 3 months duration. We suggest that in financial constraint circumstances, ABPA in children can be successfully treated without anti-IgE therapy.

Key words: Allergic Bronchopulmonary Aspergillosis, Asthma, Children.

Article Citation: Rasheed J, Hassan R, Khalid M, Zafar F. Aspergillosis; allergic bronchopulmonary aspergillosis in childhood asthma; a case report. Professional Med J 2018; 25(6):971-974. **DOI:**10.29309/TPMJ/18.4554

INTRODUCTION

Allergic Bronchopulmonary Apergillosis (ABPA) is an allergic respiratory condition resulting from hypersensitive reaction to Aspergillus fumigatus (Af). It is mostly found in adults with asthma (2%-15%)[1] and cystic fibrosis (approximately 9%).[2]

Almost all patients have symptoms of repeated cough episodes with brown mucus, wheezing, hemoptysis, respiratory difficulty, chest pain and fever. Skin prick test for Af giving immediate positive reaction is hallmark of ABPA.[3] Total serum IgE levels (>1000IU/ml), peripheral blood eosionophilia and raised aspergillus-specific antibodies in serum are other typical laboratory features of ABPA.[4]

Chest X-rays are mostly not helpful in diagnosis but high resolution chest computed tomography (HRCT) scan is more applicable. Findings of central bronchiectasis with diffuse infiltrates support the diagnosis of ABPA.[5]

Corticosteroids and antifungals are usually used as common therapy. In addition, anti-IgE drugs e.g. Omalizumab, have been shown to be useful in managing poorly-controlled allergic asthma in adults and children who require continuous/ frequent treatment with oral corticosteroids.[6]

In 2015, Zhou Y et al reported a case of ABPA in 13-year-old asthmatic girl in China.[7] Indian authors reported youngest (15-months-old) child with ABPA in 2006.[8] In 2016, Shao J et al reported two successfully treated cases of ABPA in non-cystic fibrosis boys.[9]

In Pakistan, no such case of ABPA complicating childhood asthma has been reported till far. We are sharing our success in managing ABPA in a 10-year-old asthmatic girl in order to provide some guidance for treating such pediatric patients.

CASE REPORT

A 10-year-old girl presented with complaints of on & off cough and respiratory difficulty since 8 years when she was diagnosed as a case of asthma. She had been receiving inhaled corticosteroids and short-acting β-agonists on periodic intervals to control her respiratory symptoms. This time, she presented with acute exacerbation of asthma. On examination, the girl was tachypneic and febrile with normal oxygen saturation. Her height & weight were at 50th and 75th centiles

respectively. Auscultation of chest revealed bronchial breathing on left side with bilateral crepitations and ronchi. Her complete blood picture showed TLC, 22000/mm^3 (polys-80%, lympho-7%, Eosin-10%). C-Reactive Protein was positive and erythrocyte sedimentation rate (ESR) was 50mm/hr. Her metabolic profile was normal. Chest-Xray revealed radio-opacity on left side (Figure-1) while USG chest revealed left lung consolidation with mild pleural effusion and decreased movements of left hemi-diaphragm.

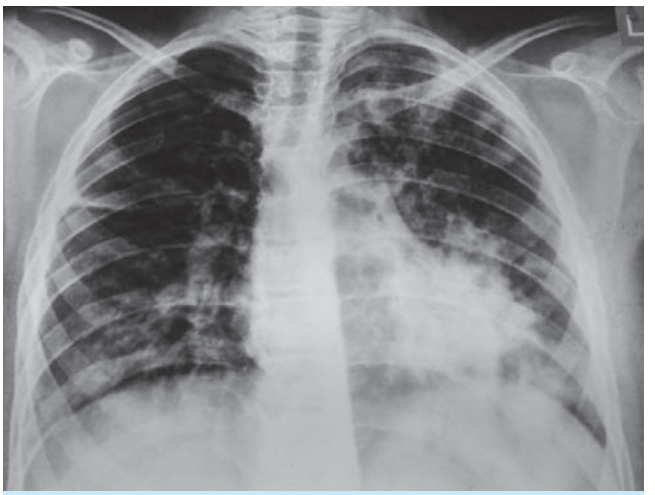


Figure-1. Chest-Xray showing bilateral lung infiltrates along with prominent radio-opacity on left side.

She was managed with oxygen, nebulization with bronchodilators, systemic corticosteroids and intravenous magnesium. She responded initially to treatment but 2 days after hospitalization, her symptoms got worsen again. Now, apart from continuing treatment, we investigated her further by high resolution CT (HRCT) chest which showed multiple areas of consolidation in both lung fields (Figure-2). We also did workup to rule out pulmonary tuberculosis which turned out to be negative. Sweat chloride results were non-suggestive for cystic fibrosis. Spirometry showed moderate obstruction with high reversibility while bronchoscopy facility was not available. Considering high eosinophil count, we sent her IgE levels which were high (1380 iu/ml). Specific IgE levels against Af were also raised i.e. 9 kUA/L (positive - >0.5 kUA/L).

So diagnosis of ABPA was made on grounds of episode of bronchial obstruction, eosinophilia, elevated serum total IgE and Af specific IgE, transient or fixed pulmonary opacities. She was given oral corticosteroids (prednisone, 1mg/kg/d for 2 weeks with tapering over 3months), oral itrazconazole (5mg/kg/d for 3 months), oral azithromycin (250mg, on alternate day for 1 month), medium dose steroid (bedesonide) inhaler in combination with long acting beta agonist (formoterol) & monteleukast (10mg/d) for total duration of 3 months. 1 week after starting treatment, her clinical symptoms resolved and she was discharged on same medications.

On follow up, 4 months after start of initial therapy, her eosinophil count was decreased and IgE levels were markedly reduced (319iu/ml). While CT scan chest showed complete resolution of pulmonary infiltrates. (Figure-3)

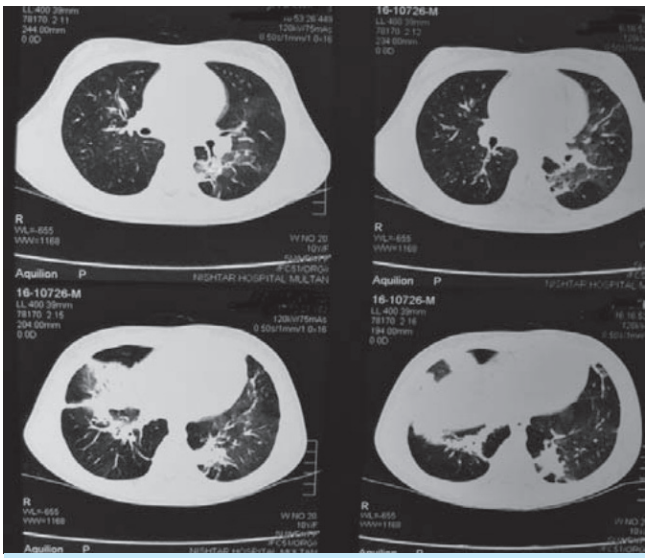


Figure-2. Multiple areas of consolidation in both lung fields along with patchy areas of pneumonitis.

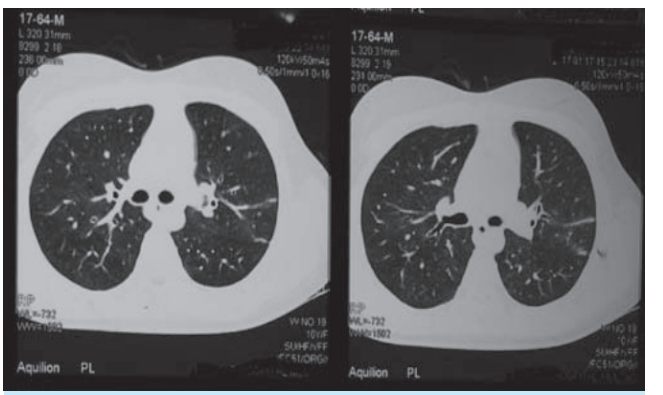


Figure-3. Follow-up HRCT scan of chest showing complete resolution of pulmonary infiltrates.

DISCUSSION

ABPA was first described by Hinson et al. in 1952. It results from abnormal host immune response to Aspergillus antigen. Persistent airway inflammation with fibrosis leading to bronchiectasis are usual pathological features which can result into end stage lung disease if not treated timely.

The Rosenberg–Patterson criteria is used commonly for diagnosis of ABPA.[10] Diagnosing ABPA in children is a challenge not only because of disease rarity itself but also due to lack of aspergillus allergens required in diagnostic criteria. In present case, five out of eight major criteria was fulfilled.

The differential diagnosis of ABPA includes tuberculosis, cystic fibrosis, sarcoidosis, eosinophilic pneumonia and churg-strauss syndrome. ABPA develops mostly exclusively in atopic patients with asthma or CF. Agarwal R, et al presented a meta-analysis in 2009 which showed high prevalence of ABPA (12.9%) in patients with bronchial asthma.[11]

In the present case, the patient also had history of asthma since her early childhood.

On chest x-ray or CT scan, pulmonary infiltrates and consolidation can be present. Bronchiectasis represents an end-stage lung disease. In children, some potential for reversibility of prebronchiectasis may exist when treatment starts early. Central bronchiectasis affecting three or more lobes and mucoid impaction, although not specific but if present, are highly suggestive of ABPA.

The treatment aims at controlling acute lung inflammation and preventing progression of further damage. Clinical practice guidelines on Aspergillosis were updated by The Infectious Diseases Society of America in 2016.[12] Mostly corticosteroids in combination with antifungal (itraconazole) are used. Corticosteroids provide an effective therapy which improve lung functions and decrease attacks of recurrent infections. Antifungal drugs are used as steroid sparing agents to prevent toxic effects of high dose steroids. Itraconazole is drug of choice. It not only leads to fall in inflammatory markers and IgE levels but also improves lung functions. The benefits of adding itraconazole include reduction of corticosteroid dose, increased interval between corticosteroid courses, and improvement in eosinophilic inflammatory parameters, IgE concentration, exercise tolerance, and pulmonary function. When used in combination, antifungal drugs and corticosteroid, have less side effects than those produced by use of steroids alone.

In our patient, we used combination therapy of prednisone and itraconazole for total duration of 3 months and we observed dramatic response not only clinically but also radiologically in our patient. Only mild side effects of oral corticosteroids (weight gain, epigastric discomfort) were noticed on follow-up for which she was reassured and given H2 receptor blocker.

An anti-IgE antibody, Omalizumab, has been used successfully in ABPA cases, Since a few years.

Recently in China, Li JX et al found that Omalizumab treatment is effective not only in decreasing IgE levels but also causes reduction in steroid requirement and improves pulmonary functions.[13]

In present case, we could not use omalizumab due to its limited availability and financial recourses and only a combination of steroids and itraconazole provided excellent results.

CONCLUSION

This case highlights the significance of considering the diagnosis of ABPA in children with uncontrolled asthma or bronchiectasis. Prompt diagnosis and early initiation of corticosteroids along with antifungal drugs can prevent irreparable damage. Omalizumab can be used not necessarily but as an alternative therapy.

REFERENCES

1. Kim JH, Jin HJ, Nam YH, Hwang EK, Ye YM, Park HS.

Clinical features of allergic bronchopulmonary aspergillosis in Korea. Allergy Asthma Immunol Res. 2012; 4:305-8.

2. Maturu VN, Agarwal R. **Prevalence of Aspergillus sensitization and allergic bronchopulmonary aspergillosis in cystic fibrosis: systematic review and meta-analysis.** Clin Exp Allergy. 2015; 45:1765-78.

3. Wikipedia contributors. **Allergic bronchopulmonary aspergillosis [Internet].** Wikipedia, The Free Encyclopedia; 2017 Nov 14 [cited 2017 Nov 20]. Available from: https://en.wikipedia.org/w/index.php?title=Special:CiteThisPage&page=Allergic_bronchopulmonary_aspergillosis&id=810378162.

4. Agarwal R. **Allergic bronchopulmonary aspergillosis.** Chest. 2009; 135:805–26.

5. Agarwal R, Khan A, Garg M, Aggarwal AN and Gupta D. **Chest radiographic and computed tomographic manifestations in allergic bronchopulmonary aspergillosis**. World J Radiol. 2012; 4:141-50.

6. Tracy MC, Okorie CUA, Foley EA, Moss RB. **Allergic Bronchopulmonary Aspergillosis.** J Fungi. 2016; 2:17.

7. Zhou Y, Xu D, Zhang Y. **Allergic bronchopulmonary aspergillosis in children.** Pediatr Int. 2015; 57:73–76.

8. Gaur SN, Khan ZU, Kumar R. **Youngest patient of ABPA in Indian Subcontinent – A Case Report.** Indian J Allergy Asthma Immunol. 2006; 20(1):37-40.

9. Shao J, Tong Z, Zhou H, et al. **Successful treatments for allergic bronchopulmonary aspergillosis in non-cystic fibrosis children: a report of two cases and a literature review.** Int J Clin Exp Med. 2016; 9(10):20352-61.

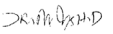
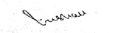
10. Rosenberg M, Patterson R, Mintzer R, Cooper BJ, Roberts M, Harris KE. **Clinical and immunologic criteria for the diagnosis of allergic bronchopulmonary aspergillosis.** Ann Intern Med. 1977; 86:405-14.

11. Agarwal R, Aggarwal AN, Gupta D, Jindal SK. **Aspergillus hypersensitivity and allergic bronchopulmonary aspergillosis in patients with bronchial asthma: systematic review and meta-analysis.** Int J Tuberc Lung Dis. 2009; 13(8):936-44.

12. Patterson TF, Thompson GR, Denning DW, et al. **Practice guidelines for the diagnosis and management of aspergillosis: 2016 Update by the infectious diseases society of America.** Clin Infect Dis. 2016:63.

13. Li JX, Fan LC, Li MH, Cao WJ, Xu JF. **Beneficial effects of Omalizumab therapy in allergic bronchopulmonary aspergillosis: A synthesis review of published literature.** Respir Med. 2017; 122:33-42.

AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Javaria Rasheed	Corresponding author, writing of manuscript, case study, literature review.	
2	Rushan Hassan	Critical review, literature review.	
3	Muhammad Khalid	Literature review, critical analysis.	
4	Fauzia Zafar	Guidance, proof reading, critical analysis.