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A CASE STUDY OF MILD PERSISTENT BRONCHIAL ASTHMA IN A PAEDIATRIC PATIENT

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ABSTRACT

Paediatric asthma is a prevalent chronic respiratory disorder characterized by reversible airway obstruction, inflammation, and hyperresponsiveness. It significantly affects quality of life, school attendance, and overall health in children. This detailed case review presents a 6-year- old male child with a clinical history of recurrent wheezing, dry cough predominantly at night, and exertional dyspnea. Diagnostic evaluation confirmed bronchial asthma with elevated eosinophils and serum IgE. Management included inhaled corticosteroids, short-acting beta agonists, and supportive therapy. Patient education, proper inhaler technique, and environmental modifications were crucial for disease control. Early diagnosis and comprehensive care are vital for improving outcomes in paediatric asthma.

INDEX TERMS: Paediatric asthma, Bronchial asthma, Levo salbutamol, Budesonide, Montelukast, Inhalation therapy, Eosinophilia, Serum IgE, Wheezing, Patient counselling.

INTRODUCTION

Asthma is a chronic inflammatory disorder of the airways in which many cells and cellular elements play a role, in particular, mast cells, eosinophils, T-lymphocytes, macrophages, neutrophils, and epithelial cells. In susceptible individuals, this inflammation causes recurrent episodes of wheezing, breathlessness, chest tightness, and coughing, particularly at night or in the early morning. These episodes are usually associated with widespread but variable airflow obstruction that is often reversible either spontaneously or with treatment. The inflammation also causes an associated increase in the existing bronchial hyperresponsiveness to a variety of stimuli.[1]

Allergic asthma, also called atopic asthma, is a chronic inflammatory disorder of the airways that occurs in response to specific allergens such as pollen, dust mites, mold, pet dander, and cockroach particles. It is often associated with elevated serum IgE levels and peripheral eosinophilia and typically begins in childhood or adolescence. Asthma is one of the most common chronic respiratory conditions in children, affecting 5-10% globally.[2] It is a heterogeneous disease usually characterised by chronic airway inflammation and variable airflow obstruction. Paediatric asthma often presents with coughing, wheezing, to missed school days, emergency visits, and reduced quality of life.[3] A comprehensive management plan including accurate diagnosis, pharmacological therapy, and education of caregivers is essential for effective asthma control.[4]

PATIENT DESCRIPTION

A 6-year-old male child, Ms. X, presented to the paediatric department with complaints of dry nocturnal cough, breathlessness on exertion, and recurrent wheezing for the past 3 months. He had a prior diagnosis of mild persistent asthma and was hospitalized two months earlier for a mild exacerbation. Family history was notable for maternal allergic rhinitis but no paternal or sibling history of asthma. The child's symptoms were triggered by dust, cold air, and playing outdoors. No drug allergies were reported.

PHYSICAL EXAMINATION

On examination, the child was alert and afebrile with normal vital signs: HR 98 bpm, RR 28/min, temperature 98.6^0F, and $SpO_2$96% on room air. These was no cyanosis or digital

clubbing. Mild intercoastal retractions were observed. Auscultation revealed bilateral expiratory wheezing without crepitations. There were no signs of respiratory infection or systemic involvement.

INVESTIGATION

Laboratory evaluations revealed normal haemoglobin (12.5g/dL) and total leukocyte count (9000/mm^3). The eosinophil percentage was elevated at 8%, with an absolute eosinophil count of 720cells/µL, suggestive of allergic inflammation. Serum IgE was markedly raised at 280IU/ml, indicating an atopic tendency. CRP was normal(2.0mg/L), ruling out active infection. Serum electrolytes were within normal ranges. Chest X-ray showed hyperinflated lung fields, a typical finding in obstructive airway disease.

DIAGNOSIS

The child was diagnosed with mild persistent bronchial asthma based on his clinical symptoms, eosinophilia, elevated IgE, and radiological findings. The diagnosis followed the Global Initiative for Asthma (GINA) guidelines, which recommend assessing system frequency, night -time awakenings, and need for rescue medication.

TREATMENT

The treatment plan was planned according to the standard paediatric asthma management protocols. The child was started on **Levolin inhaler (Levosalbutamol)** at a dose of100mcg/puff,1-2 puffs every 4 hours for symptomatic relief. It is a short-acting beta-agonist (SABA). A **Budesonide inhaler (Budesonide)** at a dose of 100mcg/puff, one puff twice daily. It served as an inhaled corticosteroid (ICS) to reduce airway inflammation. **T. Montelukast (Montelukast Sodium)** 4mg chewable tablet was given at bedtime. It was used as a leukotriene receptor antagonist (LTRA) to control allergic symptoms and nighttime coughing. **Normal Saline nebulisation (Sodium chloride0.9%)** was used to relieve congestion and maintain airway moisture, administered thrice daily as needed.

Upon discharge, the same medications were continued with dosing adjusted for home use. The inhalers were advised for regular use, and parents were instructed on proper inhalation techniques using a spacer device to enhance drug delivery.

PROGNOSIS

The prognosis of paediatric asthma is generally favorable if diagnosed early and treated

appropriately. Children with mild persistent asthma often achieve good symptom control with consistent use of controller therapy and avoidance of triggers. The child in this case responded well to treatment, with no need for systemic steroids or hospitalization beyond the acute phase. Long-term outcomes depend on adherence, trigger control, and routine monitoring.

FOLLOW-UP

Regular follow-up was advised every 1-3 months to access symptom control, review medication technique, and evaluate any adverse effects, especially from inhaled corticosteroids. Caregivers were instructed to maintain an asthma action plan and symptom dairy. Annual influenza vaccination and pneumococcal vaccination were recommended as preventive measures. Long term monitoring will focus on lung growth, development, and psychosocial adaption.

DISCUSSION

This case illustrates the classic presentation and management of mild persistent asthma in children. Paediatric asthma diagnosis relies heavily on clinical features, since spirometry is often difficult in young children. The presence of allergic markers such as elevated eosinophils and IgE supports an atopic phenotype, which often predicts better response to inhaled corticosteroids.[5]

Management should be individualized, focusing on both pharmacologic and non-pharmacologic aspects. Inhaler technique is critical; use of spacers improves drug delivery and reduces side effects. Patient and caregiver education is the cornerstone of asthma control, preventing emergency visits and promoting adherence.[4,6]

Environmental modifications such as dust control, smoke avoidance, and managing pets and pollens are essential. Nutritional support, routine physical activity (with pre-exercise inhalation if needed), and vaccination are important components of holistic care.[2,3]

PATIENT COUNSELLING

Comprehensive counselling was provided to the parents regarding the nature of asthma as a long term but controllable disease. Key points included

- Medication education: Use Levosalbutamol during wheezing or breathlessness episodes only. Budesonide must be used regularly to prevent inflammation.

Montelukast helps reduce allergic symptoms and should be taken every night. Proper inhaler technique using a spacer was demonstrated.

- Trigger avoidance: Emphasis on keeping the house dust free, avoiding cold exposure, smoke, strong Odors, and allergens. Use of air purifiers and removing stuffed toys and curtains from the child's bedroom was suggested.
- Lifestyle and nutrition: Encouraged balanced diet, hydration, and routine physical activity with precautions. Parents were informed about the importance of annual flu and pneumococcal vaccinations.
- Monitoring and follow up: Instructions were given to maintain an asthma dairy, observe for worsening symptoms, and never abruptly stop controller medications.

The counselling empowered the parents to actively participate in managing the child's asthma, enhancing treatment success and quality of life.[6]

CONCLUSION

This case highlights the effective diagnosis and management of mild persistent paediatric asthma through a comprehensive and multidisciplinary approach. Early identification of symptoms, accurate clinical evaluation, targeted pharmacological therapy, environmental control, and patient education are essential components of asthma management. With regular follow-up and adherence, children with asthma can lead healthy, active lives and avoid long – term respiratory complications.

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