### **Case Study: A 6-Year-Old with Persistent Dry Cough, Low-Grade Fever, and Crackles: Diagnosing and Managing Atypical Pneumonia in Children**

### **Introduction**

Atypical pneumonia in children often presents with non-specific symptoms, such as a prolonged dry cough, low-grade fever, and minimal respiratory distress. Early diagnosis and appropriate treatment are essential to prevent complications and support the child's growth and development. This case study explores the presentation, diagnosis, and management of a 6-year-old with atypical pneumonia.

### **Background**

Rohan, a 6-year-old boy, presented with a persistent dry cough and low-grade fever for the past 10 days. He has no significant past medical history, is up-to-date on vaccinations, and has no known contact history with cases of pulmonary tuberculosis or other respiratory infections. His parents reported a gradual onset of symptoms, with mild fatigue and decreased appetite but no acute distress.

Rohan is an active child attending school regularly, but his symptoms have started to interfere with his daily activities. He lives in a semi-urban area with potential exposure to environmental irritants. There is no history of recent travel or underlying chronic conditions.

### **Presenting Symptoms**

* Persistent dry cough lasting 10 days.
* Low-grade fever (up to 38°C) with no significant fluctuations.
* Fatigue and mild appetite loss.
* No wheezing, chest pain, or significant respiratory distress.
* Crackles heard on auscultation over the right lower lung field.

### **Investigations**

* **Chest X-ray**: Patchy infiltrates in the right lower lobe, suggestive of atypical pneumonia.
* **Complete Blood Count**: Mild leukocytosis with elevated lymphocytes, consistent with a likely viral or atypical bacterial infection.
* **C-Reactive Protein (CRP)**: Mildly elevated, suggesting inflammation.
* **Mycoplasma Pneumoniae IgM Antibody Test**: Positive, confirming Mycoplasma pneumonia.
* **Pulse Oximetry**: Normal oxygen saturation at rest and during activity.

### **Differential Diagnosis**

* **Viral Lower Respiratory Tract Infection**: Ruled out due to the prolonged nature of symptoms, lack of significant nasal congestion, and findings of localized crackles and patchy infiltrates.
* **Bacterial Pneumonia**: Ruled out as symptoms are milder and less acute, with no high-grade fever or purulent sputum production.
* **Bronchitis**: Ruled out due to the presence of systemic symptoms like fever and radiological evidence of pneumonia.
* **Atypical Pneumonia (Mycoplasma Pneumonia)**: Confirmed based on clinical presentation, positive IgM serology, and radiological findings.

### **Final Diagnosis**

Atypical Pneumonia due to *Mycoplasma pneumoniae*.

### **Treatment and Management**

#### **Pharmacological Management**

* **Antibiotic Therapy**: Oral azithromycin for 5 days to target *Mycoplasma pneumonia*.
* **Antipyretics**: For fever and symptom relief.

#### **Supportive Care**

* Encouraging hydration to alleviate throat irritation caused by coughing.
* Providing a nutrient-rich diet to address mild appetite loss and support recovery.

#### **Growth and Development Monitoring**

* Tracking weight and height to ensure recovery does not impact growth.
* Ensuring the child resumes normal physical activity post-recovery.

#### **Parental Education**

* Emphasizing adherence to the prescribed antibiotic course.
* Educating about red-flag symptoms requiring immediate medical attention, such as worsening fever, difficulty breathing, or chest pain.
* Highlighting the importance of routine vaccinations, including influenza and pneumococcal vaccines, to prevent future respiratory infections.

### **Follow-Up**

**One Week Later**: Marked improvement in cough and resolution of fever. Appetite and energy levels improved.

**One Month Later**: Full recovery with no residual symptoms. Growth parameters, including weight and height, remained on track. Chest auscultation was clear, and the child resumed school and play activities.

### **Conclusion**

This case highlights the importance of considering atypical pneumonia in children with persistent cough and systemic symptoms. Timely diagnosis using targeted investigations and appropriate antibiotic therapy is critical to ensuring recovery without complications.

Rohan’s case demonstrates that comprehensive care, including supportive measures, growth monitoring, and vaccination education, is essential to safeguarding a child’s overall health and development during and after illness.

**Case Study: Recurrent Dry Cough During Play in a 5-Year-Old: Identifying and Managing Exercise-Induced Bronchoconstriction**

### **Introduction**

Exercise-induced bronchoconstriction (EIB) is a common condition in children, often presenting with recurrent episodes of cough, wheezing, or breathlessness triggered by physical activity. Early recognition and management are essential to ensure children can participate in age-appropriate activities without compromising their growth and development. This case study discusses a 5-year-old presenting with recurrent dry cough episodes during play, highlighting the diagnostic approach and management strategies for EIB.

### **Background**

Anaya, a 5-year-old girl, presented with a history of recurrent dry cough episodes, especially triggered by physical activity such as running or playing outdoors. She has no significant past medical history, though her parents noted occasional breathlessness during active play. Anaya is a generally healthy child with normal growth and development milestones. She lives in an urban area with good access to healthcare but is exposed to occasional environmental irritants, including dust and vehicle exhaust. Her parents have no history of asthma or allergies, but they are concerned about her symptoms limiting her participation in play and school activities.

### **Presenting Symptoms**

* Recurrent dry cough episodes during or immediately after physical activity.
* Occasional shortness of breath and mild chest discomfort during vigorous play.
* Symptoms resolve spontaneously within 10-15 minutes of rest.
* No history of fever, nighttime cough, or wheezing at rest.

### **Investigations**

1. **Pulmonary Function Tests (PFT):** Normal at baseline, but a 15% drop in forced expiratory volume (FEV1) post-exercise confirmed EIB.
2. **Allergy Testing:** Negative for common allergens, ruling out allergic triggers.
3. **Chest X-ray:** Normal, with no signs of structural abnormalities or infection.
4. **Oxygen Saturation Monitoring:** Normal at rest and during mild activity.
5. **Exhaled Nitric Oxide Test:** Mildly elevated, suggesting airway inflammation.

### **Differential Diagnosis**

1. **Asthma:** Ruled out due to the absence of symptoms at rest, nighttime cough, and normal baseline PFT.
2. **Viral-Induced Wheezing:** Ruled out as there were no preceding respiratory infections or acute wheezing episodes.
3. **Cardiac Causes:** Ruled out due to normal oxygen saturation, absence of cyanosis, and lack of other cardiac symptoms.
4. **Exercise-Induced Bronchoconstriction (EIB):** Confirmed by exercise-induced drop in FEV1 and characteristic symptom pattern.

### **Final Diagnosis**

**Exercise-Induced Bronchoconstriction**

### **Treatment and Management**

1. **Pharmacological Management:**
   * **Short-Acting Beta-Agonists (SABA):** Inhaled salbutamol 15 minutes before physical activity to prevent symptoms.
   * **Leukotriene Receptor Antagonist:** Considered for daily use to reduce airway inflammation.
2. **Non-Pharmacological Measures:**
   * Warm-up exercises before vigorous activity to reduce bronchoconstriction risk.
   * Encouraging Anaya to wear a scarf or mask during outdoor activities in cold weather to minimize airway irritation.
3. **Growth and Development Monitoring:**
   * Regular follow-ups to ensure normal growth and participation in physical and social activities.
   * Tracking height and weight to identify any impact of treatment or reduced activity levels.
4. **Parental Education:**
   * Training on the proper use of inhalers and spacers.
   * Emphasizing the importance of physical activity with appropriate management to avoid restrictions.
   * Recognizing symptoms of exacerbation and seeking timely medical attention.

### **Follow-Up**

* **Two Weeks Later:** Anaya showed significant improvement with pre-activity salbutamol. She was able to participate in play without symptoms.
* **One Month Later:** Continued symptom-free activity with good adherence to management strategies. Her parents reported improved confidence in handling her condition.
* **Three Months Later:** Normal growth and development parameters, with Anaya actively engaging in school and play activities. Follow-up PFT showed sustained improvement.

### **Conclusion**

Exercise-induced bronchoconstriction, though commonly seen in children, can significantly impact their participation in physical and social activities. Early recognition and appropriate management, including pharmacological and non-pharmacological strategies, are crucial to maintaining normal growth and development. Anaya’s case highlights the importance of a tailored approach to treatment and emphasizes that children with EIB can lead active, healthy lives with the right support.