

Common Respiratory Tract Infections in Indian Children – Varied Clinical & Radiological Presentation.

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Abstract

Though, respiratory tract infections are common at all ages including childhood. yet its etiology and presentation is different in children requiring separate clinical understanding as it has to be more objective in nature due to lack of optimal communication from the patient. Hence, this article focuses on the major types of respiratory tract infections with their clinico-radiological presentations.

Keywords: Pneumonia, asthma, bronchiolitis

Introduction

Respiratory tract infections in Indian children comprise of acute respiratory tract infections, chronic infections and infections associated with allergic conditions. Pattern of respiratory tract infections is complex and is related to factors such as geographical region, season, and part of the year. Acute respiratory tract infections (ARI) are the leading cause of mortality in children worldwide with nearly equal occurrence rates in developed & developing countries but nearly one-fifth of them occurring in developing countries like India [1,2].

ARI is multifactorial in origin with viral infections being most frequent and responsible for a significant morbidity and mortality in children [3]. Other important causes include bacteria and infections caused by atypical organisms. Tuberculosis, though a chronic disease may be unmasked with an episode of ARI. Infections associated with strong allergic component include bronchiolitis and infectious asthmatic bronchitis.

Bronchiolitis

It is the most common lower respiratory tract infection in infants between 3 and 6 months. It is clinically diagnosed in children presenting with breathing difficulties, cough, poor feeding and irritability, combined

with wheezing and / or crepitations on auscultation. Respiratory syncytial virus (RSV) is the leading cause of bronchiolitis which occurs commonly in winter and early spring. Chest radiograph may show hyperinflation and parenchymal infiltrates. Diaphragm is low-placed and flattened. Lung fields appear abnormally translucent. Treatment is essentially symptomatic. In most infants disease is self limiting, lasting typically between 3 and 7 days.

Viral Pneumonia

RSV is the most common cause in younger children. Influenza & parainfluenza viruses and adenovirus are other common etiological agents at other ages. It is essentially an interstitial pneumonia. Chest radiograph shows perihilar and peribronchial infiltrates. Management is symptomatic as the course is self-limiting.

Bacterial Pneumonia

Common etiological agents include pneumococcus, staphylococcus, Hemophilus and streptococcus pneumoniae.

Pneumococcal pneumonia is commoner in winter months. Overcrowding and immunodeficient states predispose to this type. Incubation period is between 1-3 days. There is abrupt onset of headache, chills, cough and high fever. Chest radiograph usually shows lobar consolidation (figure 1). Penicillin-G 50000 units/kg/day is given intravenously for 5- 7 days.

Staphylococcal pneumonia occurs in infancy and

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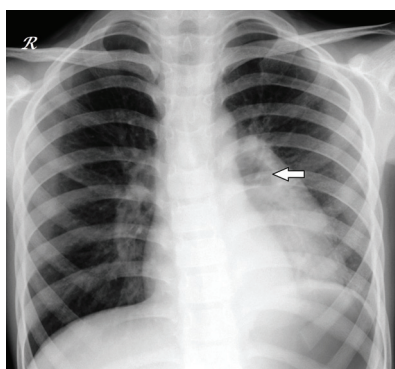


Figure 1: Chest radiograph in PA projection shows partial consolidation-collapse of left lower lobe with signs of internal cavitation (arrow) in a case of bacterial pneumonia.

childhood. It may complicate measles, influenza and cystic fibrosis of lungs or follow staphylococcal pyoderma. It presents with fever, anorexia, listlessness, irritability and respiratory distress. There may be abdominal distension and metastatic abscesses in joints, bone, muscles, pericardium, liver, mastoid or brain. Pneumatoceles may be seen on chest radiograph. Treatment requires penicillin-G, vancomycin or teicoplanin.

Hemophilus pneumonia is common between the ages of 3 months to 3 years. Bacteremia is nearly always associated with it. Clinical presentation may mimic bronchiolitis. Course of disease is subacute and prolonged. Cefotaxime or ceftriaxone is used for treatment

Streptococcal pneumonia is caused by group A, beta-haemolytic streptococci. This type of pneumonia complicates measles, influenza, chicken pox or whooping cough. Onset is abrupt with extreme prostration. Chest radiographs may show interstitial pneumonia, segmental involvement, diffuse peribronchial densities or an effusion (figure 2). Penicillin-G is given 50000 to 100000 units / kg for 7-10 days.

Atypical pneumonia is caused by *Mycoplasma*

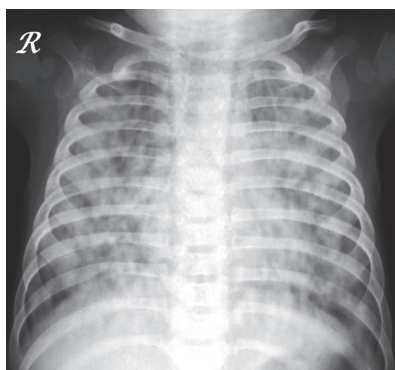


Figure 2: Chest radiograph in AP projection shows diffuse pulmonary infiltrative opacities in both lung fields in a case of bacterial pneumonia.

pneumoniae and gets transmitted by droplet infection. It occurs in epidemics chiefly in winter months. Incubation period is 12 to 14 days. Dyspnoea is unusual so it is also labelled as walking pneumonia. Poorly-defined, hazy or fluffy exudates radiate from hilar regions on chest radiograph. Extrapulmonary manifestations include haemolytic anemia. Treatment is by macrolides like azithromycin.

Tuberculosis (TB): The extent of childhood TB in India is estimated to be 10.2% of the total adult incidence [4]. The maximum risk of a child getting TB is between 1-4 years. The incubation period is between 4 to 8 weeks. Childhood TB can be intra or extrathoracic. Intrathoracic TB can be in the form of primary complex, progressive primary disease or military tuberculosis. The typical chest radiographic appearance of a pulmonary primary complex is that of an airspace consolidation of variable size, usually unifocal and homogeneous. Consolidation in progressive primary disease is usually heterogeneous, poorly-margined with predominant involvement of apical or posterior segments of upper lobe or superior segment of lower lobe (figure 3). Pleural effusion may occur in isolation. Miliary TB presents with multiple lesions usually of 2-5 mm (figure 4). Treatment requires standard antitubercular drugs.

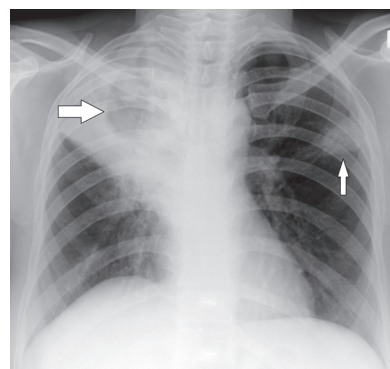


Figure 3: Chest radiograph in PA projection shows right upper lobe consolidation-collapse with cavitation (thick arrow) and subsegmental patchy pneumonitis in left upper lobe (thin arrow) in a case of progressive tubercular pneumonia.

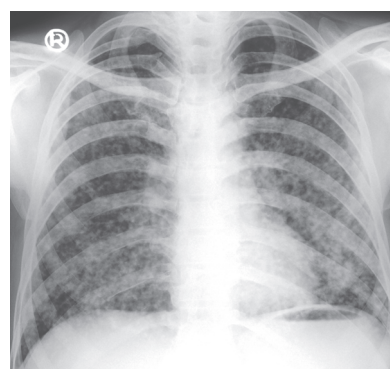


Figure 4: Chest radiograph in PA projection shows miliary opacities in both lung fields in a case of tubercular pneumonia.

Infectious asthmatic bronchitis has now been categorised under asthma. Triggers for this include rhinovirus, corona virus, parainfluenza virus, adenovirus, RSV and human metapneumovirus. Wheezing is a prominent feature. Factors underlying frequency and severity of episodes are partially understood, but some factors as severity of first episode, atopy, prematurity and exposure to tobacco smoke have been implicated [5-12]. Chest radiograph usually reveals hyperinflation. Short acting beta agonists are treatment of choice for intermittent and acute asthma episodes in very young children. Leukotriene receptor antagonists are suggested as treatment for viral induced wheeze and to reduce frequency of exacerbations in young children aged 2-5 years.

Conclusion

Indian children suffer from a variety of respiratory infections. These range from acute to chronic infections of the respiratory tract. Among acute causes, viruses and bacteria account for the majority. Chronic causes include tuberculosis as well as bronchial asthma triggered by viral infections. The radiological pictures range from apparently normal lungs to collapse-consolidation to military mottling.

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