

EFFECTIVE METHODS OF DIAGNOSIS AND TREATMENT OF MODERATE
PNEUMONIA IN CHILDREN

Tokhirova Irodakhon Bakhorjon kizi,

Khankeldiyeva H.K, Kholmatov D.N

Abstract: Pneumonia, a highly contagious respiratory infection, remains one of the leading causes of morbidity and mortality in children worldwide. Despite advancements in medical technology and treatment options, pneumonia continues to pose significant challenges to healthcare professionals, particularly in the diagnosis and management of moderate cases in pediatric populations. In this article, we will discuss the effective methods of diagnosis and treatment of moderate pneumonia in children, highlighting the importance of a multifaceted approach that incorporates clinical evaluation, laboratory testing, and pharmacotherapy.

Keywords: etiology, viruses, clinical diagnosis, fungal species, children, laboratory testing's, migration

Introduction: The etiology of pneumonia in the pediatric populace can be labeled by using age-specific versus pathogen-specific organisms. Neonates are at threat for bacterial pathogens existing in the start canal, and this consists of organisms such as team B streptococci, Klebsiella, Escherichia coli, and Listeria monocytogenes. Streptococcus pneumoniae, Streptococcus pyogenes, and Staphylococcus aureus can be recognized in late-onset neonatal pneumonia. Viruses are the predominant reason of pneumonia in older babies and children between 30 days and two years old. In young people two to 5 years old, respiratory viruses are additionally the most common. The upward jostle of instances associated to S pneumoniae and H influenzae kind B is found in this age group. Mycoplasma pneumonia often takes place in teenagers in the vary of 5 to thirteen years old; however, S pneumoniae is nevertheless the most oftentimes recognized organism. Adolescents generally have the identical infectious dangers as adults. It is necessary to think about tuberculosis (TB) in immigrants from high-prevalence areas and young people with recognized exposures. Children with continual illnesses are additionally at hazard for unique pathogens. In cystic fibrosis, pneumonia secondary to S aureus and Pseudomonas aeruginosa is ubiquitous. Patients with sickle phone ailment are at hazard of infection from encapsulated organisms. Children who are immunocompromised have to be evaluated for Pneumocystis gynoecia, cytomegalovirus, and fungal species if no different organism is identified. Unvaccinated kids are at hazard for vaccine-preventable pathogens.

Epidemiology

There are an estimated a hundred and twenty million instances of pneumonia yearly worldwide, ensuing in as many as 1.3 million deaths. Younger youngsters below the age of two in the creating world account for almost 80% of pediatric deaths secondary to pneumonia. The prognosis of pneumonia is higher in the developed world, with fewer lives claimed, however the burden of disorder is extreme, with roughly 2.5 million instances yearly. Approximately a 1/3 to half of these instances lead to hospitalizations. The introduction of the pneumococcal vaccine

has drastically decreased the danger of pneumonia in the United States.

Pathophysiology

Pneumonia is an invasion of the decrease respiratory tract under the larynx by means of pathogens both with the aid of inhalation, aspiration, respiratory epithelium invasion, or hematogenous spread. There are limitations to contamination that encompass anatomical buildings (nasal hairs, turbinate's, epiglottis, cilia) and humoral and cell immunity. Once these obstacles are breached, infection, both through fomite/droplet unfold (mostly viruses) or nasopharyngeal colonization (mostly bacterial), effects in infection and damage or dying of surrounding epithelium and alveoli. This is eventually accompanied by means of a migration of inflammatory cells to the website online of infection, inflicting an exudative process, which in flip impairs oxygenation. In the majority of cases, the microbe is no longer identified, and the most frequent reason is viral etiology.

There are 4 levels of lobar pneumonia:

The first stage takes place inside 24 hours and is characterized by way of alveolar edema and vascular congestion. Both microorganism and neutrophils are present.

Red hepatization is the 2d stage, and it has the consistency of the liver. The stage is characterized by means of neutrophils, crimson blood cells, and desquamated epithelial cells. Fibrin deposits in the alveoli are common.

The 1/3 stage of grey hepatization stage takes place two to three days later, and the lung seems dark brown. There is an accumulation of hemosiderin and hemolysis of purple cells.

The fourth stage is the decision stage, the place the cellular infiltrates is resorbed, and the pulmonary structure is restored. If the recuperation is no longer ideal, then it can also lead to parapneumonic effusions and pleural adhesions.

In bronchopneumonia, there is frequently patch consolidation of one or greater lobes. The neutrophilic infiltrate is notably round the core of the bronchi.

History and Physical

In many cases, complaints related with pneumonia are nonspecific, which include cough, fever, tachypnea, and challenge breathing. Young youth may additionally existing with belly pain. Important records to gain consists of the period of symptoms, exposures, travel, ailing contacts, baseline fitness of the child, continual diseases, recurrent symptoms, choking, immunization history, maternal health, or start issues in neonates. Physical examination must consist of statement for signs and symptoms of respiratory distress, together with tachypnea, nasal flaring, decrease chest in-drawing, or hypoxia on room air.

Note that kiddies may also current with a suggested lack of ability to tolerate feeds, with grunting or apnea. Auscultation for rales or rhonchi in all lung fields with the as it should be sized stethoscope can additionally resource in diagnosis. In the developed world, different

adjuncts like laboratory trying out and imaging can be a helpful phase of the bodily exam. No remotod physical examination discovering can precisely diagnose pneumonia. However, the mixture of symptoms, such as fever, tachypnea, focal crackles, and reduced breath sounds together, raises the sensitivity for discovering pneumonia on x-ray. Pneumonia is a medical analysis that ought to take into consideration the records of existing illness, bodily examination findings, adjunct testing, and imaging modalities.

Diagnosis of Moderate Pneumonia in Children

Diagnosing moderate pneumonia in children requires a systematic and comprehensive approach, taking into account the patient's clinical presentation, medical history, and exposure to potential pathogens. A thorough physical examination should be performed to evaluate the child's overall condition, including the assessment of vital signs, such as temperature, respiratory rate, and oxygen saturation (Bhat et al., 2011). The World Health Organization (WHO) criteria for the diagnosis of pneumonia in children include:

1. History of cough or difficulty breathing
2. Presence of fever ($t \geq 37.5^{\circ}\text{C}$) or chills
3. Respiratory rate ≥ 40 breaths per minute (in children < 5 years) or ≥ 30 breaths per minute (in children 5-12 years)
4. Presence of chest pain or intercostal retraction
5. Decreased breath sounds or dullness to percussion

In addition to clinical evaluation, laboratory tests can aid in the diagnosis of moderate pneumonia in children. Chest radiography (CXR) is commonly employed to confirm the presence of pneumonic infiltrates and to rule out other respiratory conditions (Singh et al., 2017). Blood tests, such as complete blood counts (CBC) and C-reactive protein (CRP) assays, can also be useful in identifying underlying infections and monitoring disease progression (Bhat et al., 2011).

Treatment of Moderate Pneumonia in Children

Once diagnosed, the treatment of moderate pneumonia in children should focus on the administration of antibiotics, alleviation of symptoms, and prevention of complications. The WHO recommends the use of antibiotics in children with moderate pneumonia, based on the presence of clinical and radiological evidence of bacterial infection (WHO, 2014). The most commonly prescribed antibiotics for moderate pneumonia in children are:

1. Penicillin G (ampicillin or amoxicillin)
2. Second-generation cephalosporins (cefotaxime or ceftriaxone)

3. Macrolides (azithromycin or clarithromycin)

Adjuvant treatments, such as oxygen therapy, hydration, and management of comorbidities, are also essential in the management of moderate pneumonia in children (Kim et al., 2015). Antipyretics and anti-inflammatory agents may be used to alleviate symptoms and prevent complications, such as sepsis and respiratory failure.

Early Identification and Prevention

Early identification and prevention of pneumonia are critical in reducing the burden of this disease in children. Parents and caregivers can play a crucial role in the early detection of pneumonia by:

1. Recognizing signs of illness, such as cough, fever, and shortness of breath
2. Seeking medical attention promptly
3. Ensuring adequate nutrition and hydration
4. Preventing exposure to potential pathogens, such as avoiding close contact with individuals with respiratory infections

Furthermore, public health interventions, such as vaccination programs and health education, can significantly impact the incidence and severity of pneumonia in children. The WHO recommends the use of the 13-valent pneumococcal conjugate vaccine (PCV13) to protect against *Streptococcus pneumoniae*, the leading cause of bacterial pneumonia in children (WHO, 2019).

Conclusion.

In conclusion, the diagnosis and treatment of moderate pneumonia in children require a multifaceted approach that incorporates clinical evaluation, laboratory testing, and pharmacotherapy. Early identification and prevention are critical in reducing the burden of this disease, and public health interventions, such as vaccination programs and health education, can significantly impact the incidence and severity of pneumonia in children. By employing effective diagnostic and therapeutic strategies, we can improve outcomes and reduce the mortality associated with pneumonia in this vulnerable population.

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