

CAUSATIVE AGENTS OF ACUTE RESPIRATORY DISEASES IN CHILDREN

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Abstract. Acute respiratory diseases (ARDs) remain one of the leading causes of morbidity and mortality among children worldwide. These infections are caused by a wide range of viral, bacterial, and atypical pathogens that affect the upper and lower respiratory tract. The present study aims to analyze the main causative agents of acute respiratory diseases in children, identify their epidemiological patterns, and evaluate their clinical significance. The study is based on a review of clinical observations and laboratory-confirmed cases. The results indicate that viral pathogens, particularly respiratory syncytial virus (RSV), influenza viruses, and adenoviruses, dominate in pediatric ARDs, while bacterial infections such as *Streptococcus pneumoniae* and *Haemophilus influenzae* are associated with complications. Understanding the etiological structure of ARDs is essential for effective diagnosis, treatment, and prevention.

Keywords: acute respiratory diseases, children, viral infections, bacterial pathogens, epidemiology, respiratory syncytial virus.

Introduction. Acute respiratory diseases are among the most common illnesses affecting children, especially in developing countries. According to global health data, ARDs account for a significant proportion of pediatric hospital admissions and outpatient visits. The immature immune system of children, combined with environmental and social factors, increases their susceptibility to respiratory infections.

The etiology of ARDs is complex and includes a wide variety of pathogens. These infections may range from mild upper respiratory tract illnesses to severe lower respiratory conditions such as pneumonia and bronchiolitis. Identifying the causative agents is critical for appropriate clinical management and for reducing unnecessary antibiotic use.

This study focuses on analyzing the primary causative agents of ARDs in children, highlighting their distribution, pathogenic mechanisms, and clinical implications.

Materials and Methods. The study is based on a descriptive and analytical approach using clinical and epidemiological data collected from pediatric patients diagnosed with acute respiratory diseases. The data include laboratory-confirmed cases obtained through polymerase chain reaction (PCR), bacterial cultures, and serological testing.

Children aged from 0 to 14 years presenting with symptoms such as fever, cough, nasal discharge, and difficulty breathing were included in the analysis. Pathogens were classified into viral, bacterial, and atypical groups. The frequency of each pathogen was evaluated, and its association with disease severity was assessed.

Additionally, comparative analysis was conducted to determine seasonal variations and age-related susceptibility patterns among children.

Results. The analysis revealed that viral infections are the predominant cause of acute respiratory diseases in children. Among viral pathogens, respiratory syncytial virus (RSV) accounted for the highest proportion of cases, particularly in infants under one year of age. Influenza viruses (types A and B) were more common in older children and showed clear seasonal peaks.

Adenoviruses and rhinoviruses were also frequently detected and were associated with upper respiratory tract infections. Parainfluenza viruses were identified as significant contributors to laryngotracheitis and croup.

Bacterial pathogens were less common as primary causes but were frequently associated with secondary infections and complications. The most commonly identified bacteria included *Streptococcus pneumoniae*, *Haemophilus influenzae*, and *Staphylococcus aureus*. These pathogens were strongly associated with severe pneumonia and prolonged illness.

Atypical pathogens such as *Mycoplasma pneumoniae* and *Chlamydia pneumoniae* were observed mainly in school-aged children and were linked to persistent cough and atypical pneumonia.

Seasonal analysis showed that viral infections peaked during autumn and winter, while bacterial complications were more frequent during these periods as well.

Discussion. The findings confirm that viral pathogens are the leading cause of acute respiratory diseases in children, which is consistent with global epidemiological data. The dominance of RSV highlights its critical role in infant morbidity, particularly in developing regions.

The high prevalence of influenza viruses during seasonal outbreaks emphasizes the importance of vaccination programs in reducing disease burden. Adenoviruses and rhinoviruses contribute significantly to mild but widespread infections, increasing transmission rates in communities.

Bacterial infections, although less frequent as primary causes, play a crucial role in disease progression and complications. The emergence of antibiotic resistance among common bacterial pathogens poses a significant challenge for treatment.

The presence of atypical pathogens in older children suggests the need for differential diagnosis and targeted therapy. The study also highlights the importance of laboratory diagnostics in distinguishing between viral and bacterial infections to avoid unnecessary antibiotic use.

Preventive strategies, including vaccination, improved hygiene, and early diagnosis, are essential in reducing the incidence and severity of ARDs in children.

Conclusion. Acute respiratory diseases in children are predominantly caused by viral pathogens, with RSV, influenza viruses, and adenoviruses playing a leading role. Bacterial pathogens contribute mainly to complications and severe forms of the disease. Atypical microorganisms are also significant in specific age groups.

Effective management of ARDs requires accurate identification of causative agents, rational use of antibiotics, and implementation of preventive measures such as vaccination and public health interventions. Strengthening diagnostic capabilities and increasing awareness among healthcare providers can significantly improve outcomes in pediatric populations.

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