



CONTEMPORARY DIAGNOSTIC METHODS FOR RESPIRATORY VIRAL INFECTIONS IN CHILDREN

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Abstract: *Respiratory viral infections occupy a leading place in the structure of infectious diseases in children and represent a significant problem in modern pediatrics. The high prevalence of these infections, the frequent development of complications, and the need for timely and accurate diagnosis determine the importance of improving diagnostic methods. In recent years, particular attention has been given to the introduction of modern laboratory technologies that allow more accurate and rapid detection of viral pathogens causing respiratory infections.*

Keywords: *respiratory viral infections, children, diagnostics, polymerase chain reaction (PCR), enzyme-linked immunosorbent assay (ELISA), immunochemiluminescent assay (CLIA), rapid diagnostic tests, viral diseases.*

Introduction

Respiratory viral infections (RVIs) occupy a leading place in the structure of infectious diseases among children and remain an important medical and social problem worldwide. According to the World Health Organization, viral respiratory diseases are diagnosed in millions of children every year and often lead to temporary disability of parents, increased healthcare system burden, and significant economic costs. This issue is particularly relevant in childhood, as the immune system of children is still developing, which increases their susceptibility to various viral infections.



The most common pathogens causing respiratory viral infections in children include influenza viruses, parainfluenza viruses, respiratory syncytial virus, adenoviruses, rhinoviruses, and coronaviruses. These viruses can cause a wide range of clinical manifestations, from mild catarrhal symptoms to severe lower respiratory tract involvement, including bronchiolitis and pneumonia. In addition, respiratory viral infections are often accompanied by complications such as bacterial superinfections, otitis media, sinusitis, and other inflammatory diseases.

One of the key challenges in modern pediatrics is the timely and accurate diagnosis of respiratory viral infections. Traditional clinical diagnostic methods do not always allow reliable determination of the etiological agent, since many respiratory infections have similar clinical manifestations. Therefore, in recent years, modern laboratory diagnostic methods have become increasingly important for detecting viral pathogens at the early stages of disease.

Among the most informative diagnostic approaches are molecular and serological methods such as polymerase chain reaction (PCR), enzyme-linked immunosorbent assay (ELISA), immunochemiluminescent assay (CLIA), and immunochromatographic rapid tests. These techniques allow the detection of viral genetic material or specific antibodies in biological samples and demonstrate high sensitivity and specificity.

The implementation of modern diagnostic technologies in clinical practice improves the accuracy of pathogen identification, enhances treatment effectiveness, and enables timely preventive measures. Therefore, the study and analysis of contemporary diagnostic methods for respiratory viral infections in children is of significant scientific and practical importance.

Aim of the study

To study modern diagnostic methods for respiratory viral infections in children and determine their importance in the timely detection of viral



pathogens.

Materials and Methods

This study was conducted among children aged 2 to 10 years. A total of 32 children, including both boys and girls with clinical signs of respiratory viral infections, participated in the study. All patients were examined in outpatient and inpatient conditions of a medical institution.

Modern laboratory diagnostic methods were applied during the study to detect respiratory viral infections. Molecular and serological diagnostic techniques were used to identify viral pathogens. The main diagnostic methods included polymerase chain reaction (PCR), enzyme-linked immunosorbent assay (ELISA), immunochemiluminescent assay (CLIA), and immunochromatographic rapid tests.

Biological samples obtained from the upper respiratory tract of patients were used as research material. Laboratory tests were performed using modern diagnostic test systems and equipment in accordance with standard methodological guidelines. The obtained data were analyzed using descriptive statistical methods.

Results and Discussion

The conducted study demonstrated that respiratory viral infections are widely распространены among children of early and preschool age. Most of the examined children presented typical clinical manifestations of respiratory viral infections, including fever, cough, runny nose, nasal congestion, and general weakness. In some cases, symptoms of lower respiratory tract involvement were also observed.

The use of modern laboratory diagnostic methods made it possible to more accurately identify the viral nature of the disease. Molecular diagnostic techniques such as polymerase chain reaction (PCR) showed high sensitivity and specificity in detecting viral pathogens in biological samples. Serological diagnostic methods, including enzyme-linked immunosorbent assay (ELISA)



and immunochemiluminescent assay (CLIA), allowed the detection of specific antibodies to viral infections.

Immunochromatographic rapid tests also demonstrated their effectiveness in rapid diagnostics, especially in outpatient practice. Rapid identification of the causative agent is important for timely initiation of appropriate therapy and prevention of possible complications.

The obtained results confirm the importance of applying modern diagnostic technologies in pediatric practice. The combined use of molecular, serological, and rapid diagnostic methods increases the accuracy of detecting respiratory viral infections in children and contributes to improving the quality of medical care.

Conclusion

Respiratory viral infections remain one of the most common causes of morbidity among children and represent a significant problem in modern pediatrics. The high prevalence of these infections requires the use of effective and modern diagnostic methods.

The use of modern laboratory techniques such as polymerase chain reaction (PCR), enzyme-linked immunosorbent assay (ELISA), immunochemiluminescent assay (CLIA), and immunochromatographic rapid tests contributes to more accurate and timely detection of viral pathogens. The application of these diagnostic technologies improves the effectiveness of diagnosing respiratory viral infections in children and enhances the quality of medical care.

Thus, the implementation of modern diagnostic methods in clinical practice is important for the timely detection of respiratory viral infections and the optimization of therapeutic and preventive measures.

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БОЛЬНЫХ ТУБЕРКУЛЕЗОМ ОТ ЖИВОТНЫХ В НЕБЛАГОПОЛУЧНЫХ ПО ТУБЕРКУЛЕЗУ ХОЗЯЙСТВАХ. Проблемы современной науки и образования, (7 (185)), 48-53.

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