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EDITORIAL

Use of molecular test for adenovirus detection between different pediatric patients

Aplicação de teste molecular para detecção de adenovírus em pacientes pediátricos distintos

Terezinha Maria de Paiva

Laboratório de Vírus Respiratórios/NDR/CV, Instituto Adolfo Lutz, São Paulo, Brazil

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The evolution of the methodologies used in the diagnosis of acute respiratory infections of viral etiology is due to the advancement of molecular biology, immunology, genetics and biotechnology. The development of the *in vitro* cell culture¹ resulted in the isolation of viruses associated with acute respiratory infection of the respiratory tract (respiratory syncytial virus, adenovirus and parainfluenza virus). The discovery of the molecular structure of nucleic acids² contributed to the development of molecular genetics, responsible, among other things, for the improvement of molecular diagnosis of infectious diseases in the late twentieth century, as well as the disclosure of new viral etiologies related to acute respiratory infection in the first decades of the 21st century.

By the end of the 1980s, the diagnosis of respiratory infection consisted in the isolation of the virus in cell cultures and serology. The great challenge faced by scientists at the time was to enhance diagnostic methodologies, aiming to address the appropriate strategies for disease prevention and control; i.e., to establish methodologies that would allow attaining fast and specific diagnoses.³

Considering the impact of infection by respiratory viruses in all age groups, especially among children <5 years of age,

patients with chronic diseases and adults ≥ 60 years of age,^{3,4} a rapid diagnosis is important for: antiviral use; respiratory disease etiology clarification; considering prescription of antibiotics; knowing the natural history of the virus and its physiopathology, which helps to understand the possible complications that may occur depending on the infection characteristics; assessment of disease containment through quarantine; measuring the hospitalization period; preventing unnecessary laboratory investigations, and dispensing with inappropriate isolation of non-infected individuals.^{5,6}

The development of monoclonal antibodies in the 1970s⁷ contributed to the development of a specific antibody panel for influenza virus types A and B, RSV, ADV, and PIV 1, 2 3, which allows the fast and specific identification by direct or indirect immunofluorescence of the seven respiratory viruses. The advent of molecular methodologies, starting in the 1980s,⁸ of which principle resides on the Polymerase Chain Reaction (PCR), allowing the amplification of conserved genome targets of different etiological agents, revolutionized the understanding of epidemiology, diagnosis and research of infectious diseases of viral etiology, among other approaches. Currently, there are several

fast and specific diagnostic methods, using both the principle of immunofluorescence with monoclonal antibodies and molecular methods, for simultaneous identification of different viruses.^{9,10}

In this issue of *Revista Paulista de Pediatria*, Puerari et al.¹¹ assessed the performance of both methods, using a method that allows simultaneous identification of the seven respiratory viruses by direct immunofluorescence and molecular diagnosis using Nested Polymerase Chain Reaction - nested PCR, aiming at the investigation of adenovirus in respiratory secretions collected from children with congenital heart disease and children from the community with acute respiratory infection (ARI).

This phase of the research did not include the analysis of other respiratory viruses; however, it showed that the molecular methodology was more sensitive for the detection of adenovirus in different groups of children, when compared to immunofluorescence. Due to the sensitivity in the detection of nucleic acids by nested PCR reported in the present analysis, the authors recommend routine surveillance in patients with congenital heart disease by molecular methods, considering the efficiency in the etiological agent detection, especially the diagnostic flow performance.

In this context, investment in research for the development of antiviral agents for noninfluenza respiratory viruses, as well as to obtain knowledge on the molecular epidemiology of different respiratory viruses in the community is of utmost importance, as it will yield important information regarding the infection of hospitalized patients and of patients with chronic diseases by different viruses that affect the respiratory tract.¹²

To date, no antiviral drug has been approved against adenoviruses, which are well known for their capacity to cause severe disease, particularly in immunosuppressed patients. Recent clinical studies have assessed the oral formulation of the antiviral brincidofovir as a promising treatment for patients belonging to risk groups and infected by adenoviruses.¹³

The evolution of diagnostic methodologies potentiates researches aiming at the creation of antiviral agents and their timely intervention, providing better quality of life and consequent advances in the field of Public Health.

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Conflicts of interest

The author declares no conflicts of interest.

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