



ORIGINAL ARTICLE

Short-term relevance of lower respiratory viral coinfection in inpatients under 2 years of age^{☆,☆☆}

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KEYWORDS

Coinfection;
Virus;
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Abstract

Introduction: Advances in molecular diagnosis have made it possible to detect previously unknown viral agents as causative agents of lower respiratory tract infections (LRTI). The frequency and relevance of viral coinfections is still debatable.

Objective: Compare clinical presentation and severity between single virus infection and viral coinfection in children admitted for LRTI.

Methods: A 3-year period observational study (2012–2015) included children younger than two years admitted for LRTI. Viral identification was performed using PCR technique for 16 viruses. Clinical data and use of health resources was gathered during hospital stay using a standard collection form and we compared single virus infection and viral coinfections.

Results: The study included 524 samples (451 patients); 448 (85.5%) had at least one virus identified. Viral coinfections were found in 159 (35.5%). RSV and HRV were the most commonly identified virus; bronchiolitis and pneumonia the most frequent diagnosis. Patients with viral coinfections were older, attended day-care centers, had previous recurrent wheezing more frequently and were more symptomatic at admission. These patients did not have more

Abbreviations: ADV, adenovirus; CI, confidence intervals; COV, coronavirus; CRP, C reactive protein; CXR, chest X-ray; ED, emergency department; FLUA, influenza virus A; FLUB, influenza virus B; HBOV, human bocavirus; HEV, human enterovirus; HRV, human rhinovirus; ICU, intensive care unit; IQR, interquartile range; IVRI, infecciones de la vías respiratorias inferiores; LOS, length of stay; LRTI, lower respiratory tract infection; MPV, metapneumovirus; NPA, nasopharyngeal aspirates; O₂, supplemental oxygen; OR, odds ratio; PCR, polymerase chain reaction; PIV, parainfluenza; RSV, respiratory syncytial virus; SD, standard deviation; SpO₂, peripheral capillary oxygen saturation.

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PALABRAS CLAVE

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hospitalizados

complementary exams performed but were prescribed medications more often. Viral coinfection group did not show longer length of hospital stay and oxygen need, more need for ICU nor ventilatory support.

Discussion: Our study showed a significant proportion of viral coinfections in young infants admitted with LRTI and confirmed previous data showing that prescription was more frequent in inpatients with viral coinfections, without an association with worst clinical outcome.

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Relevancia a corto plazo de la coinfección viral en pacientes menores de 2 años hospitalizados con infecciones de las vías respiratorias inferiores

Resumen

Introducción: Avances en el diagnóstico molecular han hecho posible la detección de agentes virales desconocidos en infecciones de las vías respiratorias inferiores (IVRI). Sin embargo, sigue habiendo dudas relativamente a su frecuencia y relevancia.

Objetivo: Comparar la clínica y la gravedad entre la infección por virus único y la coinfección en niños admitidos por IVRI.

Métodos: Se realizó un estudio durante 3 años consecutivos (2012-2015) que incluyó a niños menores de 2 años ingresados por IVRI. La identificación viral se realizó mediante la técnica de PCR para 16 virus. Los datos clínicos y el uso de los recursos hospitalarios se recogieron de forma estándar durante la estancia hospitalaria y se compararon la infección única con coinfecciones virales.

Resultados: Fueron analizadas 524 muestras (451 pacientes); 448 (85,5%) tuvieron al menos un virus identificado. Coinfecciones virales se encontraron en 159 (35,5%). RSV y HRV fueron los virus más frecuentes; bronquiolitis y neumonía, los diagnósticos principales. Los pacientes con coinfecciones virales eran mayores, iban a la guardería, tenían sibilancias recurrentes con más frecuencia y eran más sintomáticos al ingreso. No fueron sometidos a más exámenes, pero les fueron prescritos medicamentos con más frecuencia. El grupo de la coinfección viral no mostró una mayor duración de la estancia hospitalaria, de la necesidad de oxígeno, de UCI o soporte ventilatorio.

Discusión: Nuestro estudio mostró una proporción significativa de coinfecciones virales en los niños pequeños ingresados con IVRI y confirma datos previos que muestran que la prescripción es más frecuente en las coinfecciones virales, sin asociación con peor resultado clínico.

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Introduction

Lower respiratory tract infections (LRTI) are a common cause of hospital admission in pediatric patients,¹⁻³ especially under two years of age.⁴⁻⁶ Different viruses have been identified as etiologic agents of LRTI [respiratory syncytial virus (RSV), adenovirus (ADV), influenza virus A (FLUA) and B (FLUB), human rhinovirus (HRV), parainfluenza1 (PIV1), 2 (PIV2), 3 (PIV3)].⁷⁻¹⁰ RSV remains the most important viral pathogen in infancy both as a single agent and in coinfection.^{4,6}

In the last two decades, the emergence of polymerase chain reaction (PCR) based technology has substantially increased the sensitivity for viral diagnosis, detecting a larger number of viruses, including more than one virus in the same respiratory secretion sample.^{2,11,12} Such assays identify virus not growing in standard tissue culture,² and have identified at least four new viruses associated with

LRTI: metapneumovirus (MPV),¹³ coronavirus (COV),¹⁴⁻¹⁶ bocavirus (HBOV)¹⁷ and parainfluenza 4 (PIV4).^{18,19}

In children hospitalized with severe LRTI, viral coinfection detected by PCR shows a prevalence ranging between 14% and 44%.²⁰ Whether viral coinfection has a significant clinical impact is yet to be defined.^{6,11,21-24} A recent meta-analysis found divergent outcomes dependent mainly on age (adult patients included), comorbidities, seasonality, geographical region and methods of detection employed.²⁵

The primary objective of this study was to compare severity of presentation and short-term clinical evolution between single virus infection and viral coinfection in children admitted for LRTI. We additionally intended to compare the amount of health resources used between groups.

We hypothesized that patients with viral coinfection would have a more severe disease and a higher need for diagnostic and therapeutic health care resources.

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