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ORIGINAL ARTICLE

Respiratory viral infections in a cohort of children during the first year of life and their role in the development of wheezing☆

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KEYWORDS
Respiratory infections;
Viral infections;
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Rhinovirus;
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Infants

Abstract
Introduction: It is known that infants with viral respiratory infections severe enough to require hospital admission have a high risk of developing recurrent wheezing. Few data have been published on unselected populations. The main aim of this study was to analyse symptomatic and asymptomatic respiratory viral infections during the first year of life in a cohort of infants, recruited at birth, and the development of recurrent wheezing.
Patients and methods: A total of 302 newborns were recruited. A nasopharyngeal aspirate was taken when the patients had a respiratory infection, as well as in the visits for vaccination at 2, 4, 6, and 12 months. RT-nested PCR assays were performed to detect 16 viruses.

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Results: A total of 1293 samples were analysed (1005 healthy controls and 288 respiratory infections). Samples taken during routine check-ups were positive in 30.8% of cases, while those with respiratory infection were positive in 77.8%, $P < .001$ (OR: 3, 95% CI: 2.4–3.8). A total of 239 (79%) infants had at least 1 positive respiratory viral infection detected. The most frequent virus (71%) was rhinovirus (RV). Recurrent wheezing was found in 27 (11%) children during their first year of life (1.2 episodes, SD 2.9). Recurrent wheezing was present in 58.3% of patients admitted to hospital during their first viral infection, vs. 8.6% of infants when the first infection was mild or who had asymptomatic viral detection, $P < .001$ (OR: 2.18; 95% CI: 1.05–4.5).
Conclusions: In our series, severe respiratory infections leading to hospitalisation in the first months of life are risk factors for developing wheezing, but not in the case of mild RV infections.

PALABRAS CLAVE
Infecciones respiratorias;
Infecciones virales;
Infecciones asintomáticas;
Rinovirus;
Sibilancias;
Lactantes

Infecciones virales respiratorias en una cohorte de niños durante el primer año de vida y su papel en el desarrollo de sibilancias

Resumen
Introducción: Las infecciones respiratorias virales que requieren hospitalización parecen conferir riesgo de desarrollar sibilancias recurrentes, pero existen pocos datos publicados en poblaciones no seleccionadas por tener factores de riesgo. Nuestro objetivo principal fue analizar si las infecciones respiratorias virales sintomáticas y asintomáticas, de diferente gravedad, durante el primer año de vida en una cohorte de recién nacidos, suponen un mayor riesgo de sibilancias recurrentes.
Pacientes y métodos: Se incluyeron 302 recién nacidos. Se recogió aspirado nasofaríngeo a los niños cuando presentaron una infección respiratoria y de forma periódica en los controles de salud (2, 4, 6 y 12 meses). Se estudiaron 16 virus respiratorios mediante reacción en cadena de polimerasa (PCR).
Resultados: Se analizaron 1.293 muestras (1.005 controles de salud y 288 infecciones respiratorias). El 30,8% de las muestras tomadas en los controles de salud fueron positivas, frente a un 77,8% en las infecciones respiratorias, p < 0,001 (OR: 3, IC 95%: 2,4-3,8). Un total de 239 (79%) lactantes tuvieron al menos una detección viral positiva durante el primer año de vida. El virus más frecuentemente identificado (71%) fue el rinovirus (RV). En 27 lactantes (11%) se detectaron sibilancias recurrentes durante su primer año de vida (2,9 DE: 1,2 episodios). El 58,3% de los lactantes cuya primera infección respiratoria requirió hospitalización desarrollaron sibilancias de repetición, frente al 8,6% de los niños cuya primera infección fue leve o asintomática, p < 0,001 (OR: 2,18; lC 95%: 1,05-4,5).
Conclusiones: En nuestra serie, las infecciones respiratorias virales graves en los primeros meses de vida supusieron un factor de riesgo para desarrollar sibilancias recurrentes. No ocurrió lo mismo con las infecciones respiratorias leves.

Introduction

Acute respiratory infections (ARIs) are a major reason for health care use in infants and constitute a substantial economic burden.[1,2] Although infections in this age group are most frequently of a viral aetiology,[3,4] inappropriate antibiotic use continues to be widespread. Techniques based on the polymerase chain reaction (PCR) have made the aetiological diagnosis of ARIs possible in children, and made us aware of the high prevalence of asymptomatic viral infections.[5,6] Respiratory syncytial virus (RSV), human metapneumovirus (hMPV) and influenza virus (FLU) have been clearly identified as respiratory pathogens, and more recent studies have been analysing the role of other viruses such rhinovirus (RV) and human bocavirus (hBoV), although the high prevalence of coinfection with other respiratory viruses or their detection in asymptomatic patients pose challenges to the interpretation of these positive results.[7,8]

It is known that children with severe RSV infection that require hospitalisation are at high risk of developing asthma in the long term, even as late as age 18 years, as Sigurs et al. demonstrated.[9] There is also evidence of an increased risk of recurrent wheezing up to age 5 years in infants hospitalised due to bronchiolitis associated to hMPV.[10] There are