



ORIGINAL ARTICLE

Human parainfluenza virus surveillance in pediatric patients with lower respiratory tract infections: a special view of parainfluenza type 4[☆]

Luciano M. Thomazelli^{a,*}, Danielle B. L. de Oliveira^a, Giuliana S. Durigon^b, Brett Whitaker^c, Shifaq Kamili^c, Eitan N. Berezin^b, Edison L. Durigon^a

^a Universidade de São Paulo (USP), Instituto de Ciências Biomédicas, São Paulo, SP, Brazil

^b Irmandade da Santa Casa de Misericórdia de São Paulo, São Paulo, SP, Brazil

^c Center for Disease Control and Prevention, Atlanta, United States

Received 13 April 2017; accepted 11 July 2017

KEYWORDS

Human parainfluenza virus;
Respiratory virus;
Pediatric patients;
Acute respiratory illness;
Human respirovirus 4

Abstract

Objective: Characterize the role of human parainfluenza virus and its clinical features in Brazilian children under 2 years of age presenting with acute lower respiratory tract infections.

Methods: Real-time assays were used to identify strains of human parainfluenza virus and other common respiratory viruses in nasopharyngeal aspirates. One thousand and two children presenting with acute lower respiratory tract illnesses were enrolled from February 2008 to August 2010.

Results: One hundred and four (10.4%) patients were human parainfluenza virus positive, of whom 60 (57.7%) were positive for human parainfluenza virus-3, 30 (28.8%) for human parainfluenza virus-4, 12 (11.5%) for human parainfluenza virus-1, and two (1.9%) for human parainfluenza virus-2. Seven (6.7%) patients had more than one strain of human parainfluenza virus detected. The most frequent symptoms were cough and fever, similar to other viral respiratory infections. Clinical manifestations did not differ significantly between human parainfluenza virus-1, -2, -3, and -4 infections. Human parainfluenza virus-1, -3, and -4 were present in the population studied throughout the three years of surveillance, with human parainfluenza virus-3 being the predominant type identified in the first two years.

[☆] Please cite this article as: Thomazelli LM, Oliveira DB, Durigon GS, Whitaker B, Kamili S, Berezin EN, et al. Human parainfluenza virus surveillance in pediatric patients with lower respiratory tract infections: a special view of parainfluenza type 4. J Pediatr (Rio J). 2017. <http://dx.doi.org/10.1016/j.jpmed.2017.07.017>

* Corresponding author.

E-mail: lucmt@usp.br (L.M. Thomazelli).

<http://dx.doi.org/10.1016/j.jpmed.2017.07.017>

0021-7557/© 2017 Sociedade Brasileira de Pediatria. Published by Elsevier Editora Ltda. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Conclusion: Human parainfluenza viruses contribute substantially to pediatric acute respiratory illness (ARI) in Brazil, with nearly 30% of this contribution attributable to human parainfluenza virus-4.

© 2017 Sociedade Brasileira de Pediatria. Published by Elsevier Editora Ltda. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

PALAVRAS-CHAVE

Vírus da parainfluenza humana;
Vírus respiratório;
Pacientes pediátricos;
Doença respiratória aguda;
Respirovírus humano 4

Vigilância do vírus da parainfluenza humana em pacientes pediátricos com infecções do trato respiratório inferior: uma visão especial da parainfluenza tipo 4

Resumo

Objetivo: Caracterizar o papel do VPH-4 e suas características clínicas em crianças brasileiras com menos de 2 anos de idade com infecções agudas do trato respiratório inferior.

Métodos: Ensaios em tempo real foram utilizados para identificar tipos de VPH e outros vírus respiratórios comuns em aspirados nasofaríngeos. Mil e duas crianças com doença aguda do trato respiratório inferior foram inscritas para participar de fevereiro de 2008 a agosto de 2010.

Resultados: 104 (10,4%) pacientes eram VPH positivos, dos quais 60 (57,7%) eram positivos para VPH-3, 30 (28,8%) para VPH-4, 12 (11,5%) para VPH-1 e dois (1,9%) para VPH-2. Sete (6,7%) pacientes apresentaram mais de um tipo de VPH detectado. Os sintomas mais frequentes foram tosse e febre, semelhantes a outras infecções respiratórias virais. As manifestações clínicas não diferiram de forma significativa entre as infecções por VPH-1, -2, -3 e -4. Os VPH-1, -3 e -4 estavam presentes na população estudada ao longo dos três anos de vigilância, e o VPH-3 foi o tipo predominante identificado nos primeiros dois anos.

Conclusão: Os VPHs contribuem substancialmente para a DRA pediátrica no Brasil com quase 30% dessa contribuição atribuível ao VPH-4.

© 2017 Sociedade Brasileira de Pediatria. Publicado por Elsevier Editora Ltda. Este é um artigo Open Access sob uma licença CC BY-NC-ND (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Introduction

Viruses are the predominant cause of acute respiratory illness (ARI) worldwide, and are responsible for substantial morbidity and mortality in children between 1 and 5 years of age. Human parainfluenza viruses (HPIVs) account for a significant proportion of viral ARIs in children, representing the second most common cause of upper and lower respiratory tract infections, just after human respiratory syncytial virus (HRSV).¹ The four HPIV serotypes, HPIV-1, -2, -3 and -4, and two subtypes, -4a and -4b, are estimated to cause up to 10% of childhood ARIs.² HPIV1 and HPIV2 are the primary cause of croup in children aged 6–48 months; HPIV3, and to a lesser extent HPIV1, are more often associated with bronchiolitis and pneumonia in children under 1 year. HPIVs also cause severe disease, including pneumonia and death in transplant recipients, as well as nosocomial infections and outbreaks, similar to HRSV and influenza virus.³

Little is known about the epidemiology and disease burden of HPIVs in the pediatric populations of Latin America, especially in Brazil.^{1,4–6} There are even less studies concerning HPIV-4 infection in America since few laboratories provide specific diagnoses of HPIV-4. Because of its apparently low prevalence and its difficulty of growth in cell culture.⁷

To better characterize the role of HPIV-4 and its clinical features in children under 2 years of age with ARI, real time reverse transcription polymerase chain reaction (rRT-PCR) analyses were used to identify four strains of HPIV

and other common respiratory viruses in nasopharyngeal aspirates.

Methods

The research ethics committee of Institute Biomedical Science of the University of São Paulo approved the study. From March 2008 to August 2010, nasopharyngeal aspirate samples were collected from patients under 2 years of age with ARI, attended to or hospitalized at the Santa Casa de Misericórdia Hospital (São Paulo, Brazil), after written consent was obtained from the children's parents. The samples were placed in a viral transport tube and held up to 48 h at 4 °C. The samples were processed in a biosafety level 2 laboratory at the Institute of Biomedical Science, University of São Paulo. Total nucleic acids were automatically extracted from 300 µL of fresh specimen and eluted in 110 µL of RNase-free elution buffer using NucliSENS easyMAG (bioMérieux–Brazil) according to the manufacturer's instructions. Nucleic acids were kept frozen at –70 °C until use. A multiple singleplex rRT-PCR assay panel was used to detect and identify HPIVs (types 1, 2, 3, and 4)⁸ and other human respiratory viruses, including respiratory syncytial virus, human metapneumovirus, adenovirus, and influenza viruses A and B.^{9–11} The statistical analyses was conducted with Statgraphics Centurion XV software; the chi-squared test for comparison of proportions was used for each symptom to verify the proportion of patients presenting the symptom in the serotypes analyzed. It also generated an analysis of means (ANOM)

Download English Version:

<https://daneshyari.com/en/article/11008302>

Download Persian Version:

<https://daneshyari.com/article/11008302>

[Daneshyari.com](https://daneshyari.com)