



ORIGINAL ARTICLE

Respiratory viral infections in infants with clinically suspected pertussis[☆]

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KEYWORDS

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Abstract

Objective: to evaluate the frequency of respiratory viral infections in hospitalized infants with clinical suspicion of pertussis, and to analyze their characteristics at hospital admission and clinical outcomes.

Methods: a historical cohort study was performed in a reference service for pertussis, in which the research of respiratory viruses was also a routine for infants hospitalized with respiratory problems. All infants reported as suspected cases of pertussis were included. Tests for *Bordetella pertussis* (BP) (polymerase chain reaction/culture) and for respiratory viruses (RVs) (immunofluorescence) were performed. Patients who received macrolides before hospitalization were excluded. Clinical data were obtained from medical records.

Results: Among the 67 patients studied, BP tests were positive in 44%, and 26% were positive for RV. There was no etiological identification in 35%, and RV combined with BP was identified in 5%. All patients had similar demographic characteristics. Cough followed by inspiratory stridor or cyanosis was a strong predictor of pertussis, as well as prominent leukocytosis and lymphocytosis. Rhinorrhea and dyspnea were more frequent in viral infections. Macrolides were discontinued in 40% of patients who tested positive for RV and negative for BP.

Conclusion: the results suggest that viral infection can be present in hospitalized infants with clinical suspicion of pertussis, and etiological tests may enable a reduction in the use of macrolides in some cases. However, the etiological diagnosis of respiratory virus infection, by itself, does not exclude the possibility of infection with BP.

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PALAVRAS-CHAVE

Coqueluche;
Vírus respiratórios;
Infecção respiratória;
Lactentes

Infecções por vírus respiratórios em lactentes com suspeita clínica de coqueluche**Resumo**

Objetivo: avaliar a frequência das infecções por vírus respiratórios em lactentes hospitalizados com suspeita clínica de coqueluche e analisar suas características admissionais e evolutivas.

Métodos: foi realizado um estudo de coorte histórica, em um serviço sentinela para coqueluche, no qual a pesquisa de vírus respiratórios também foi rotineira para os lactentes hospitalizados com problemas respiratórios. Foram incluídos todos os lactentes submetidos à notificação compulsória de suspeita de coqueluche. Foram realizadas pesquisas para *Bordetella pertussis* – BP (PCR/cultura) e vírus respiratórios – VR (imunofluorescência). Foram excluídos os pacientes que haviam recebido macrolídeos previamente à internação. Os dados clínicos foram obtidos dos prontuários.

Resultados: dentre os 67 pacientes analisados, a pesquisa para BP foi positiva em 44% e para VR em 26%. Não houve identificação etiológica em 35% e em 5% houve codeteção de VR e BP. Todos os pacientes apresentaram características demográficas semelhantes. A presença de tosse seguida de guincho inspiratório ou cianose foi um forte preditor de coqueluche, assim como, leucocitose e linfocitose evidentes. Coriza e dispneia foram mais frequentes nas infecções virais. Houve suspensão do uso de macrolídeos em 40% dos pacientes com pesquisa positiva para VR e negativa para BP.

Conclusão: os resultados sugerem que lactentes hospitalizados com suspeita de coqueluche podem apresentar infecção viral e a pesquisa etiológica pode possibilitar a redução do uso de macrolídeos em alguns casos. No entanto, salienta-se que o diagnóstico etiológico de infecção por vírus respiratórios, por si só, não exclui a possibilidade de infecção por *Bordetella pertussis*.

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Introduction

Acute respiratory infections are prevalent in pediatric patients, particularly in infants.¹ The clinical manifestations depend on the etiological agent, patient-related factors, and environmental interactions.^{1,2} Often, the etiological diagnosis of respiratory infections in infants cannot be based on clinical parameters, as symptoms caused by different microorganisms may be similar.²

Pertussis is an acute respiratory disease caused by *Bordetella pertussis* (BP), whose clinical presentation, unlike other respiratory infections, generally has characteristics that differentiate it from other etiologies. Most often, the diagnosis is made during the paroxysmal phase, when coughing spells occur, which may be accompanied by vomiting, cyanosis, and apnea lasting from one to six weeks.^{3,4} More severe clinical presentations are observed in young infants not yet fully immunized, in whom infections by respiratory viruses are frequent and constitute an important differential diagnosis in hospitalized patients.²

Identifying patients with respiratory virus (RV) infection among those with clinical suspicion of pertussis may contribute to minimize the use of macrolides, adjust measures to prevent in-hospital transmission of respiratory infections, and elucidate the impact of co-detection of BP and VR.²⁻⁴

The objectives of this study were to evaluate the frequency of RV infections in hospitalized infants with clinically suspected pertussis, and to analyze their characteristics at hospital admission and evolution during hospitalization.

Methods

A historical cohort study was conducted in the Division of Pediatric Clinic of the Hospital Universitário da Universidade de São Paulo (HU-USP), which during the study period was a pertussis surveillance service and had respiratory virus research as a routine procedure for all infants hospitalized with respiratory illness.

Infants admitted to the pediatric ward between April 2009 and June 2012, who were submitted to compulsory notification as “suspected” case of pertussis, according to the guidelines of the Department of Health of the State of São Paulo (which considers as “suspected cases” those who, regardless of vaccination status and age, present dry cough for at least two weeks accompanied by inspiratory stridor, paroxysmal cough, or vomiting after coughing), were included in the study.⁴

Patients were selected from the electronic database of the HU-USP. RV investigation was conducted by indirect immunofluorescence assay (IFA) in nasopharyngeal aspirates, collected during the first 24 hours of hospitalization. For this laboratory test, a standardized kit (Biotrin International Ltd. – Dublin, Ireland) was used for the identification of seven respiratory viruses (RSV, Adenovirus, Influenza A and B, and Parainfluenza 1, 2, and 3). The tests were performed at the clinical laboratory of the HU-USP. BP investigation was performed in a material obtained by nasopharyngeal swab using polymerase chain reaction (PCR) and culture in Regan-Lowe (RL) semisolid medium.

BP investigation was performed at the Laboratory of Immunology of Instituto Adolfo Lutz de São Paulo (IAL), as recommended by the “Manual of Laboratory Diagnosis,

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