

Severity of bronchiolitis associated with atypical pathogens in hospitalized infants in Georgia  
Bronhiolitis izazvan atipičnim bakterijama kod hospitalizovane dece

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**Summary** **Introduction:** Bronchiolitis is the most common reason for hospitalization worldwide. Respiratory syncytial virus (RSV), human Metapneumovirus, human Rhinoviruses, human Bocavirus have been shown to predominate. A few studies however have attempted to determine whether other pathogens, particularly Mycoplasma Pneumoniae (Mpn) and Chlamydophila pneumoniae (Cpn), are associated with bronchiolitis in children under 2 years of age. The aim of this study was to determine the prevalence and severity of Mpn and Cpn infection in children under the age of two years presenting to the Iashvili Central Children Hospital in Tbilisi.

**Material and Methods:** Acute and convalescent serum samples were tested by ELISA for IgM and IgG antibodies to RSV, Cpn and Mpn. 37 children under two years of age were studied. In 19 patients out of 37 (51.35%) etiological diagnosis were established and in 18 patients (48.65%) no pathogens were found. 11 patients (29.72%) had either Cpn or Mpn and 8 patients (21.62%) had RSV.

**Results:** Children infected with Cpn and Mpn had less severe bronchiolitis than those infected with RSV. There were no statistically significant differences between groups with respect to length of hospital stay.

**Conclusion:** Our study underlines the importance of atypical bacterial pathogens in acute bronchiolitis in children under two years of age and highlights the complex epidemiology and clinical features of these pathogens in this age group.

**Key words:** mycoplasma pneumoniae, chlamydophila pneumoniae, respiratory syncytial virus, bronchiolitis, children

**Sažetak** **Uvod:** Bronhiolitis je najčešći uzrok hospitalizacije odojčadi i male dece širom sveta. Respiratory syncytial virus (RSV), humani Metapneumovirus, humani Rhinoviruses, humani Bocavirus smatraju se dominantnim uzročnicima. I drugi uzročnici, naročito Mycoplasma Pneumoniae (Mpn) i Chlamydophilapneumoniae (Cpn), udruženi su sa pojavom bronhiolitisa kod dece mlađe od dve godine života. Cilj našeg istraživanja je bio da odredimo učestalost i težinu bronhiolitisa izazvanih Mpn i Cpn kod dece mlađe od dve godine života, lečenih u Dečjoj bolnici Iashvili u Tbilisju u Gruziji.

**Metodologija:** Akutni i rekoalescentni serum pacijenata testirani su ELISA testom na IgM i IgG antitela na RSV, Cpn and Mpn. 37 –oro dece mlađe od dve godine života je ispitivano. Kod 19-oro dece (51.35%) detektovan je uzročnik, dok kod 18-oro pacijenata (48.65%) uzročnik nije utvrđen. 11-oro pacijenata (29.72%) je imalo infekciju Cpn ili Mpn a osam pacijenata (21.62%) je imalo infekciju RSV.

**Rezultati:** Deca sa bronhiolitisom izazvanim Cpn i Mpn imali su manje ozbiljne forme bolesti u odnosu na decu kod kojih je izolovan RSV. Koinfekcija nije uticala na težinu bolesti u našoj studiji. Nije bilo statistički značajne razlike između grupa u odnosu na dužinu hospitalizacije.

**Zaključak:** Rezultati naše studije naglašavaju značaj atipičnih patogenih bakterija za pojavu bronhiolitisa kod dece mlađe od dve godine, i ističu kompleksnost epidemioloških i kliničkih karakteristika ovih patogenih uzročnika u grupi dece do dve godine starosti.

**Cljučne reči:** mycoplasma pneumoniae, chlamydophila pneumoniae, respiratorni sincicijalni virus, bronhiolitis, deca

## Introduction

Bronchiolitis is the most common reason for children hospitalization in many countries, challenging both economy, area and staffing in paediatric departments (1, 2).

The causes of bronchiolitis have been studied in different environments and populations. In most studies *Respiratory syncytial virus (RSV)*, *human Metapneumovirus*,

human Rhinoviruses, human Bocavirus have consistently been shown to predominate.

A few studies, however, have attempted to determine whether other, particularly atypical pathogens *Mycoplasma Pneumoniae (Mpn)* and *Chlamydia pneumoniae (Cpn)*, which are frequently detected in older children and adults with asthma exacerbation, are associated with bronchiolitis in children under 2 years of age (3,4,5).

**Objectives**

The aim of this study was to determine the prevalence and severity of atypical pathogens in children under the age of 2 years presenting to the Iashvili Central Children Hospital.

**Materials and Methods**

Acute and convalescent serum samples were tested by ELISA for IgM and IgG antibodies to RSV, *Cpn* and *Mpn*. Positive results were defined by a significant antibody response in specific IgM or a 4-fold increase in IgG titer in paired serum samples.

established in 19 patients out of 37 (51.35%). Patients were grouped according to pathogens in three groups: in the group I were included 11 patients with *Cpn* and *Mpn*; in the group II - 8 patients with RSV; in the group III - 7 patients with mixed-infections with *Cpn*, *Mpn* and RSV.

There was no significant difference in age between infants presenting with bronchiolitis associated with different pathogens.

Overall, 57.9% (n = 11) of children had mild disease, 31.6% (n=6) moderate disease and 10.5% (n=2) severe disease. Children with RSV were more likely to have moderate and severe than mild disease (62.5% vs. 27.3%, p <0.05) compared to children without RSV infection, whilst children with *Cpn* and *Mpn* infection were more likely to have mild than moderate disease (72.7% vs. 27.3%, p = 0.05).

Infants with RSV had higher bronchiolitis severity scores with a median of 4.89 vs. infants with atypical pathogens (median 3.37, p<0.05) and vs. infants with mixed-infections (median 3.57, p<0.05).

|                          | 0                                       | 1   | 2  |
|--------------------------|---|---|--|
| <b>Respiratory rate</b>  | normal < 40/min                         | slightly increased 40 - 60/min                | clearly increased > 60/min                         |
| <b>Oxygen saturation</b> | ≥ 95% in room air                       | 92-94% in room air                            | < 92% in room air, or need for supplemental oxygen |
| <b>Wheezing</b>          | none                                    | audible with stethoscope                      | audible without stethoscope                        |
| <b>Retractions</b>       | none                                    | mild-moderate                                 | severe   |
| <b>General condition</b> | not affected:<br>alert/quietly sleeping | moderately affected:<br>irritable or agitated | severely affected:<br>lethargic, poor feeding      |

**Table 1.** Dyspnea Score

Children included in the study were divided into age groups of 0-6 months, 7-11 months, and 12-24 months.

Daily dyspnea score (Table 1) was assessed in all patients by using symptom score on a scale from 0 to 10 based on a clinical scoring system according to Kristjansson et al. (6). Children with dyspnea score from 0 to 3 were considered as a mild bronchiolitis, with score 4-6 as a moderate and with score 7-10 as a severe bronchiolitis.

The results have been analyzed by the SPSS Statistics versions 16.0. p<0.05 has been considered as significant difference.

**Results**

Thirty seven children under two years of age were studied. Their median (range) age was 11.86 month (age distribution from 3 to 23 months). Etiological diagnosis was

**Conclusion**

Our results showed that children infected with *Cpn* and *Mpn* had less severe bronchiolitis than those infected with RSV. Co-infection was not associated with the disease severity.

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Primljeno/Received: 31. 10. 2015.

Prihvaćeno/Accepted: 14. 11. 2015.

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