Epidemiology of human respiratory viruses in children with acute respiratory infections in Russia

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Background: Acute respiratory infections (ARI) are associated with significant morbidity and mortality worldwide, especially in children under the age of 5 years. The prevalence and correlation of pathogens in ARI are critical for improving case prevention, treatment, and management. In this study, we investigated the prevalence and correlation of viral agents in children with ARI.

Material/methods: We collected nasal and throat swab samples from patients with ARI. All specimens were tested for common respiratory viruses, including influenza virus types A, B, parainfluenza virus types 1-3, respiratory syncytial virus, human metapneumovirus, human coronaviruses, adenovirus, rhinovirus and human bocavirus, using a real-time PCR assay.

Results: A total of 778 samples were collected from patients with acute respiratory infections: 277 samples were obtained from December 2013 to April 2014, 501 samples were obtained from October 2014 to April 2015. There were 412 males (52,9%) and 366 females (47,1%), and the patients' ages ranged from 3 months to 15 years: 207 patients (26,6%) were under 1 year, 328 (42,2%) were 1 – 3 years, 122 (15,7%) were 4 – 6 years, 121 (15,5%) were 7 years and older. Among all patients tests, 529 (68%) were found positive for at least one virus with respiratory viruses detected at the highest positive rate in children less than 7 years old. Among the 529 positive samples, single infections accounted for 57% (444/778), while co-infections accounted for 11% (85/778).

Respiratory syncytial virus was the most frequently identified in winter 2014 accounted for 46,2% (128/277) of all samples collected from December 2013 to April 2014. Rhinovirus was detected in 10,8% (30/277) of cases of ILI in that period. Influenza viruses were identified in 5% (14/277) and other viruses were identified less than 5% of the samples.

In 2014-2015 21,7% (109/501) of the samples were positive for rhinovirus and 17,9% (90/501) were positive for respiratory syncytial virus. Influenza viruses were identified in 14,4% (72/501) and other viruses were identified less than 10% of the samples. Influenza A(H3N2) was predominant in 2014 – 2015.

Conclusions: Thus viral etiology of ILI was confirmed in 68% of the cases with co-infection rate for 11% of all cases. The most frequent detected viruses were respiratory syncytial virus and rhinovirus.
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