Respiratory Virus Detection From Polymerase Chain Reaction of Nasal Specimens Collected Longitudinally in Healthy Children in a US Birth Cohort

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Abstract

Background

Respiratory viral shedding is incompletely characterized by existing studies due to the lack of longitudinal nasal sampling and limited inclusion of healthy/asymptomatic children. We describe characteristics associated with prolonged virus detection by polymerase chain reaction (PCR) in a community-based birth cohort.

Methods

Children were followed from birth to 2 years of age in the PREVAIL cohort. Weekly nasal swabs were collected and tested using the Luminex Respiratory Pathogen Panel. Weekly text surveys were administered to ascertain the presence of acute respiratory illnesses defined as fever and/or cough. Maternal reports and medical chart abstractions identified healthcare utilization. Prolonged virus detection was defined as a persistently positive test lasting ≥4 weeks. Factors associated with prolonged virus detection were assessed using mixed effects multivariable logistic regression.

rhinovirus/enterovirus infections, 14% of respiratory syncytial virus (RSV) A infections, and 7% of RSV B infections. No prolonged detection was found for influenza virus A or B, coronavirus 229E or HKU1, and parainfluenza virus 2 or 4 infections. First-lifetime infection with each virus, and co-detection of another respiratory virus were significantly associated with prolonged detection, while symptom status, child sex, and child age were not.

Conclusions

Prolonged virus detection was observed in 1 in 4 viral infections in this cohort of healthy children and varied by pathogen, occurring most often for bocavirus and rhinovirus/enterovirus. Evaluating the immunological basis of how viral co-detections and recurrent viral infections impact duration of virus detection by PCR is needed to better understand the dynamics of prolonged viral shedding.

Topic: polymerase chain reaction, enterovirus, coronavirus, cough, fever, enterovirus infections, influenza a virus, parainfluenza virus 2, human, respiratory tract infections, rhinovirus, virus diseases, virus shedding, influenzavirus a, nose, pathogenic organism, well child, pathogenicity, human bocavirus, community, birth cohort, nasal swabs

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