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Correspondence

Respiratory viruses and acute asthma in children

To the Editor:

We read with great interest the article by Khetsuriani et al¹ on the prevalence of respiratory tract viruses in children with asthma. The results of PCR analysis of combined nasopharyngeal and throat swabs for 13 different viruses were positive in 63% of patients with asthma exacerbation in the 1-year study. Rhinovirus was the most common virus detected.

We disagree with the low virus detection rate reported by Khetsuriani et al¹ because many studies in wheezing children have shown virus detection rates of close to 90%. We have also recently reported the viral cause of acute wheezing (specific clinical diagnoses were not reported) in 259 hospitalized children.^{2,3} Of these 259 children, 40 had acute asthma that fulfilled the criteria of the National Heart, Lung, and Blood Institute.⁴ The median age of the asthmatic children was 2.4 years (range, 9 months to 11 years), and 65% of them were boys. Thirty-seven (93%) children had symptoms of acute respiratory tract infection (ie, runny nose, fever, or both). Virus culture, virus antigen detection, PCR techniques (for 16 viruses), and serologic testing were used. A potential causative agent was identified in 38 (95%) patients (Table I). Among them, the results of PCR were positive for 1 or more viruses in 93%, virus culture in 28%, virus antigen detection in 18%, and virus serology in 33%. Rhinovirus, enteroviruses, parainfluenza viruses, and human bocavirus were the most common viruses. All 7 patients with human bocavirus had low virus genome copy numbers (<10⁴ copies/mL), and in no case was bocavirus detected in serum, which might suggest long-term virus carriage rather than symptomatic infection.³ No patients with positive results for influenza A virus, metapneumovirus, or coronaviruses were found, as also reported by Khetsuriani et al.¹ Interestingly, 2 or more viruses were detected in 43% of the children compared with 7% in the study by Khetsuriani et al.¹

The differences between our findings and those of Khetsuriani et al¹ might be due to many differences in these 2 studies. We enrolled patients over a 2-year period, the children in our study were younger, and all were hospitalized. Furthermore, nasopharyngeal aspirates were obtained and tested for 16 viruses by using both molecular and traditional diagnostic techniques. Finally, the sensitivities of methods for some viruses might be different.

Our findings suggest that nearly all exacerbations of asthma in children necessitating hospitalization are associated with viral infection. In nearly half of the cases, there is evidence for other coexisting viruses. The gradual disappearance of rhinovirus RNA within 5 to 6 weeks after acute wheezing suggests that the occurrence of rhinovirus RNA is associated with an acute symptomatic infection, and therefore our study also supports the view that rhinovirus infection is closely associated with exacerbation of asthma in children.⁵

TABLE I. Viral cause of asthma exacerbation in 40 children

Virus	Total	As a sole virus
Rhinovirus*	19 (48%)	10 (25%)
Enteroviruses	13 (33%)	7 (18%)
Parainfluenza virus types 1 to 4†	10 (25%)	1 (3%)
Human bocavirus	7 (18%)	1 (3%)
Respiratory syncytial virus	6 (15%)	2 (5%)
Adenovirus	4 (10%)	0
Influenza A or B virus‡	3 (8%)	0
Coronavirus NL63, OC43, 229E, or HKU1	0	0
Human metapneumovirus	0	0
Cases with mixed viral infection§	17 (43%)	—
Cases with positive virus detection	38 (95%)	21 (53%)

*Six nontypable picornavirus PCR-positive samples not available for sequence analysis were included as rhinovirus because all 12 sequenced nontypable picornavirus-positive samples turned out to be rhinoviruses.

†Parainfluenza virus type 1 in 2 cases, parainfluenza virus type 3 in 2 cases, parainfluenza virus type 1 or 3 in 3 cases, and parainfluenza virus type 4 in 3 cases.

‡Influenza B virus in 3 cases.

§Rhinovirus plus human bocavirus in 2 cases, rhinovirus plus enterovirus in 2 cases, enterovirus plus respiratory syncytial virus in 2 cases, and rhinovirus plus adenovirus, rhinovirus plus parainfluenza virus type 1, rhinovirus plus respiratory syncytial virus, rhinovirus plus human bocavirus plus parainfluenza virus type 4, human bocavirus plus respiratory syncytial virus, human bocavirus plus influenza B virus plus enterovirus, human bocavirus plus parainfluenza virus type 1 plus adenovirus, parainfluenza virus type 1 or 3 plus adenovirus, parainfluenza virus type 3 plus influenza B virus, parainfluenza virus type 3 plus influenza B virus plus enterovirus plus adenovirus, and parainfluenza virus type 4 plus enterovirus in 1 case each.

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