Delayed Seasonal RSV Surge Observed During the COVID-19 Pandemic

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An unexpected positive outcome of the coronavirus disease 2019 pandemic has been the marked decline in illness associated with other respiratory viruses, likely due to the widespread use of masks and social distancing. Respiratory syncytial virus (RSV) is a seasonal virus that typically peaks in the fall and declines by early spring. In the United States, RSV is responsible for annually 57 000 hospitalizations and 500 000 emergency department visits among children <5 years old.[1] Reports from around the world have revealed up to a 98% reduction in RSV cases during the pandemic.[2,3] The initial studies came from the Southern Hemisphere countries that were at the beginning of their fall season in March 2020, when the pandemic started.[3] It was unclear whether the 2020–2021 RSV season would continue to be markedly reduced or just be delayed.[4]

In a recent study from Australia, researchers described an RSV surge as physical distancing restrictions were relaxed. The number of RSV cases began to increase during their spring months and peaked in their summer, instead of the typical fall and winter months. Their data also reveal a higher than expected peak and infection in older children.[5]

METHODS

We reviewed all positive polymerase chain reaction tests for RSV in patients 0 to 18 years old, reported by the laboratory at our New York City (NYC) hospital, from January 2016 to May 8, 2021. For the 2019–2021 RSV seasons, we reviewed deidentified data on the ages of the patients who were seen at our hospital and had a positive RSV polymerase chain reaction test. We also noted whether the patient was hospitalized to either the regular pediatric inpatient care area or the PICU as well as the length of the hospital stay.

Because the data were deidentified, an institutional review board approval was not required for the study.

RESULTS

From 2016 to 2019, RSV cases at our hospital followed the expected seasonal pattern (Fig 1). There were no cases from September 2020 through January 2021. Our first patient with RSV for the 2020–2021 Fall season had a delayed start in February 2021, and the first hospitalized infant with RSV was in early March. Weekly reports reveal a continuing surge in cases through April (Fig 2). A total of 295 patients tested positive for RSV. The median age of our cohort was 6 months (range: 12 days to 9 years). Of the 197 (66.7%) children who were admitted to the hospital, the majority (160 of 197; 81%) were admitted to the PICU; 6 required ventilator support, and the rest received either noninvasive ventilation or high flow nasal oxygen. The median length of hospital stay was 4 days. In contrast, during the 2019–2020 season, the median age of admitted patients was

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Drs Agha and Avner conceptualized and designed the study, drafted the initial manuscript, reviewed and revised the manuscript, approved the final manuscript as submitted, and agree to be accountable for all aspects of the work.

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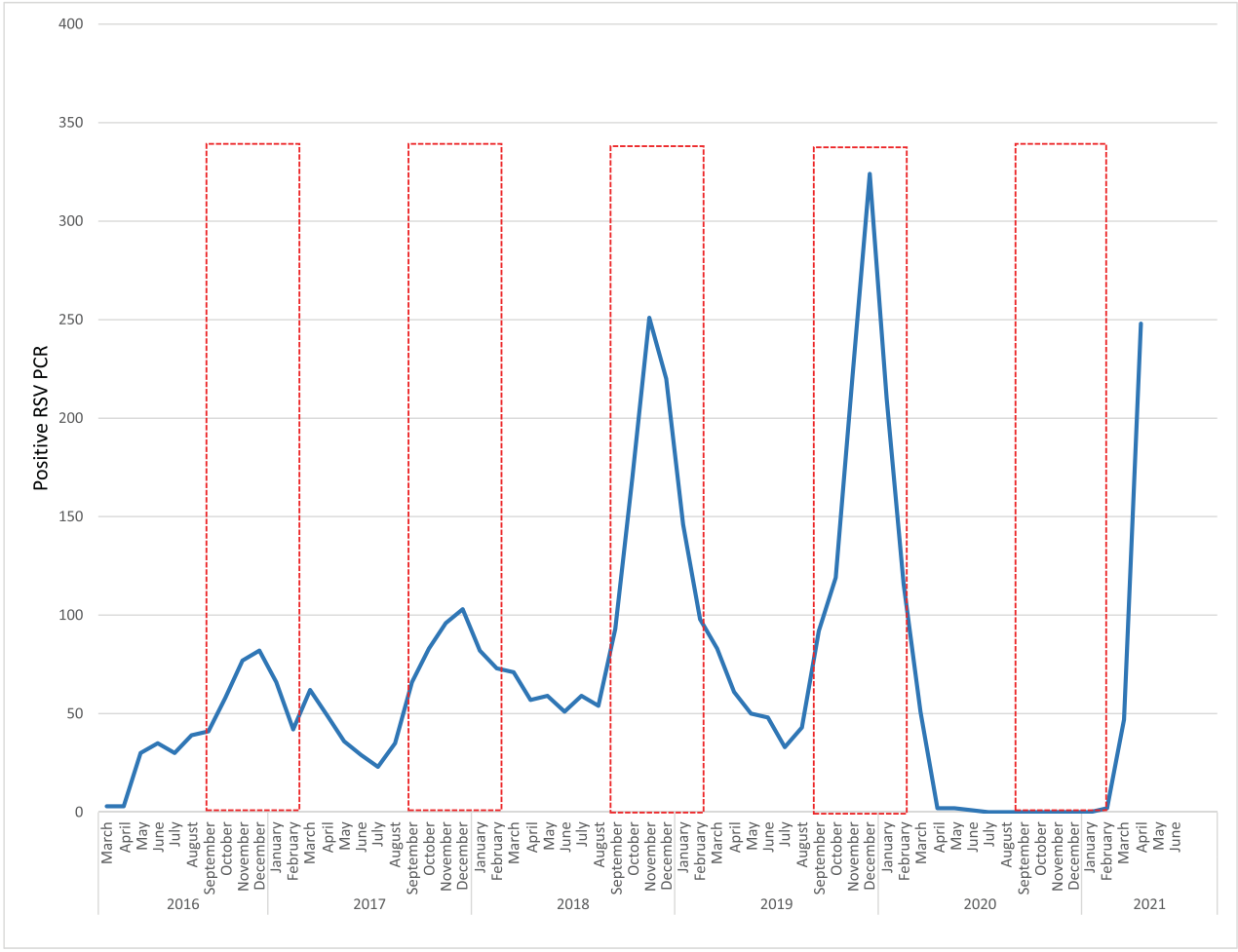

FIGURE 1
Annual RSV trends at our hospital from 2016 to April 30, 2021. The dashed red boxes represent the typical RSV season. No RSV cases were recorded for the 2020 Fall or Winter season. PCR, polymerase chain reaction.

17 months (range: 11 days to 18 years), only 45% were admitted to the ICU, and the median length of stay was 3 days.

Influenza activity in NYC has remained minimal during the pandemic[6]; we have seen a total of 5 influenza cases in our hospital during this season. Severe acute respiratory syndrome coronavirus 2 activity at our institution has followed the NYC pattern as well, with a steady, consistent positivity rate, a slight upsurge in the numbers for the month of March 2021, followed by a progressive decline.[7]

DISCUSSION

Our results reflect similar findings to that seen in Western Australia. NYC Department of Health surveillance data are beginning to reveal the same trend in RSV cases.[6] Our data indicate more severe disease in younger infants, possibly because of diminished immunity from a lack of exposure to RSV in the previous season. Continuing closures of day care centers and virtual schooling may have resulted in less spread of the disease to older children.

This seasonal shift and delayed peak of RSV in young children could be encountered in other parts of the country, especially as control measures are relaxed and schools reopen. Although our early findings cannot predict the height of the RSV surge or how long it may last, it does suggest that institutions should plan ahead for an increase in pediatric emergency visits and, potentially,

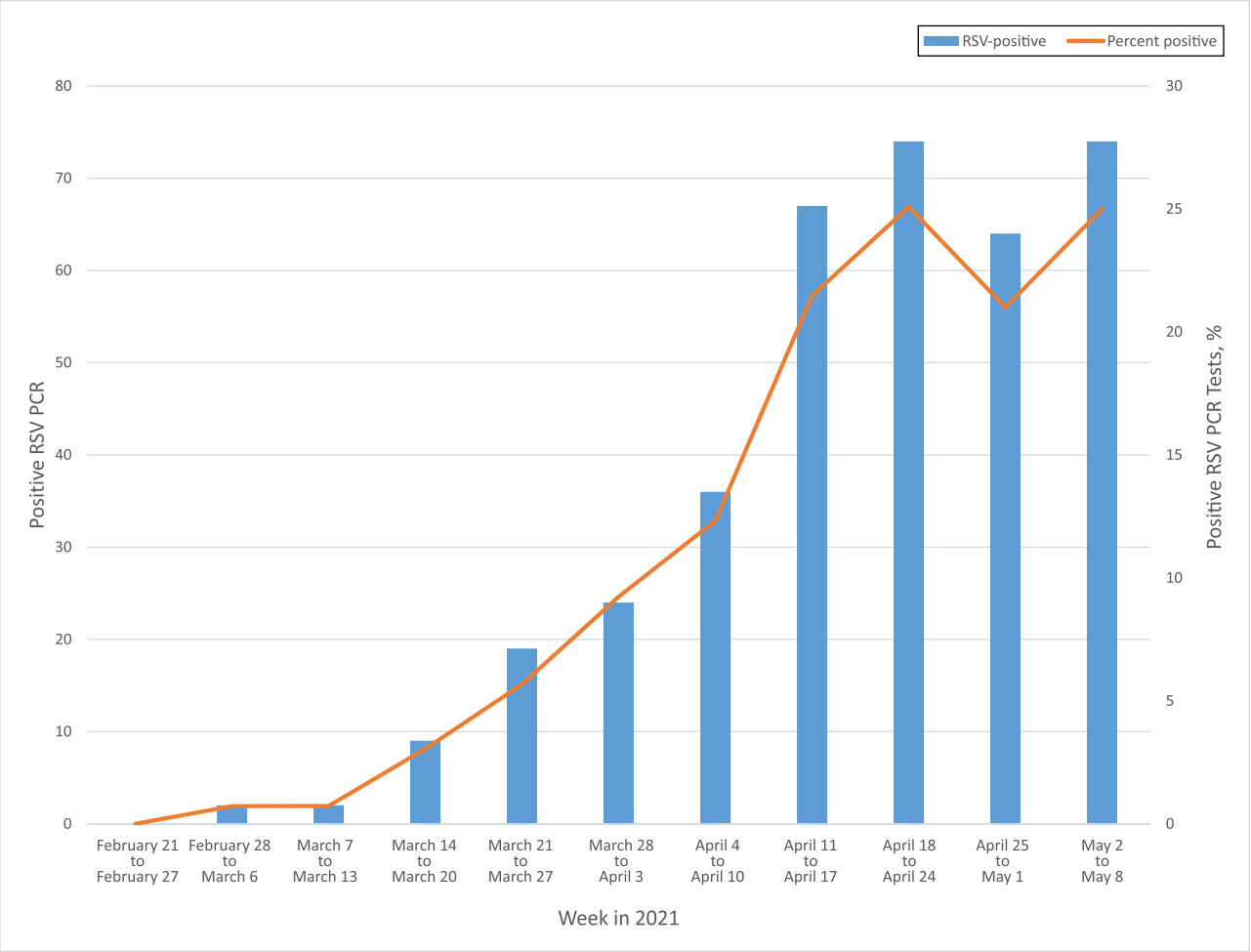

FIGURE 2
Weekly RSV positive cases in numbers from March 1 to May 8, 2021. The red line represents the percent positivity of RSV of all tested. PCR, polymerase chain reaction.

a need for increased PICU capacity in the coming weeks. Additionally, efforts should be made to extend monthly preventive palivizumab for infants at risk for severe RSV disease, to ensure continued protection during this unexpected surge.

ABBREVIATIONS

NYC: New York City
RSV: respiratory syncytial virus

REFERENCES

1. Centers for Disease Control and Prevention. Respiratory syncytial virus-associated mortality (RSV-associated mortality) 2019 case definition. Available at: https://wwwn.cdc.gov/nndss/conditions/respiratory-syncytial-virus-associated-mortality/case-definition/2019/. Accessed April 20, 2021
2. Van Brusselen D, De Troeyer K, Ter Haar E, et al. Bronchiolitis in COVID-19 times: a nearly absent disease? *Eur J Pediatr*. 2021;180(6):1969–1973
3. Yeoh DK, Foley DA, Minney-Smith CA, et al. Impact of coronavirus disease 2019 public health measures on detections of influenza and respiratory syncytial virus in children during the 2020 Australian winter [published online ahead of print September 28, 2020]. *Clin Infect Dis*. doi:10.1093/cid/ciaa1475
4. Baker RE, Park SW, Yang W, Vecchi GA, Metcalf CJE, Grenfell BT. The impact of COVID-19 nonpharmaceutical interventions on the future dynamics of endemic infections. *Proc Natl Acad Sci USA*. 2020;117(48):30547–30553
5. Foley DA, Yeoh DK, Minney-Smith CA, et al. The interseasonal resurgence of respiratory syncytial virus in Australian children following the reduction of coronavirus disease 2019–related public health measures [published online ahead of print February 17, 2021]. *Clin Infect Dis*. doi:10.1093/cid/ciaa1906
6. New York City Department of Health and Mental Hygiene. Influenza surveillance report: week ending April 17, 2021 (week 15). Available at: https://www1.nyc.gov/assets/doh/downloads/pdf/hcp/weekly-surveillance04172021.pdf. Accessed April 26, 2021
7. NYC Health. Latest data. Available at: https://www1.nyc.gov/site/doh/covid/covid-19-data.page. Accessed May 15, 2021

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