

Respiratory Syncytial Virus Infection in the Aftermath of COVID-19: Is It a Case of Old Wine in a New Bottle?

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Respiratory infections remain the leading cause of morbidity and mortality among infants worldwide, especially in the developing world.¹ Respiratory syncytial virus (RSV) infection contributes to a significant burden of respiratory infections among infants worldwide.² Though in a vast majority of infants RSV does not result in a life-threatening illness the overall burden on the healthcare system is significant in terms of outpatient and emergency attendance and inpatient admissions. In 2019, 33 million RSV-associated acute lower respiratory infection episodes, 3.6 million RSV-associated acute lower respiratory infection hospital admissions, 26,300 RSV-associated acute lower respiratory infection in-hospital deaths, and 1,01,400 RSV-attributable overall deaths were estimated in children aged 0–60 months.² It has also been observed that the burden and possibly severity of RSV infections have changed in the post-COVID-19 scenario in many countries. Though there has been a significant decrease in the detection of RSV transmission during COVID-19, there have been predictions of larger and more severe seasonal outbreaks once all the COVID-19 restrictions are withdrawn.³

In this context, the article by Ghosh et al. in this issue of the journal is interesting especially since the data is from India during the period from November 2021 to February 2022.⁴ They have looked at the data of children admitted with lower respiratory infection in their hospital and reported the proportion of children with RSV infection. They have also attempted to develop a clinical score to predict the need for pediatric intensive care unit (PICU) admission among children with RSV infection. A total of 127 children were included with a median interquartile range (IQR) age of 6 (2–12) months, the proportion of RSV positivity being 72.6%. Among them, 30% required PICU admission, and 24% developed complications. Premature birth, age below 1 year, presence of underlying congenital heart disease, and hypoxia were independent predictors of the requirement for PICU admission. The proportion of infants requiring PICU admission was higher than usually reported figures in the literature.^{5,6} The authors have attributed this to increased susceptibility and severity of RSV infection in immunologically naive children or referral bias.⁴ In the absence of standard criteria for PICU admission, it is difficult to compare this data across different study populations. Even the fact that 21% of study children with proven RSV infection required mechanical ventilation is not an indicator of the severity of RSV infection per se during the period as 33% of the study children had significant comorbidities. It is also pertinent to note that only

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30.7% of children had room air oxygen saturation of less than 92% at admission, nearly half of them (46.1%) requiring PICU admission subsequently. Similarly, extrapulmonary manifestations were seen in 15% of study children, three-fourths (74%) of them requiring PICU admission. Other major contributors to PICU admission were children with congenital heart disease and those with a history of prematurity; 62 and 63% of children with these two comorbidities required PICU admission. In short, three-fourths of all children with extrapulmonary manifestations and two-thirds of those with either congenital heart disease or prematurity required PICU admission.⁴

The authors have also attempted to develop a score for predicting PICU admission in their study population.⁴ It appears to be a potentially useful tool especially in resource-limited settings and in peripheral hospitals where early identification of children requiring advanced supportive measures can be lifesaving. The score seems to have a good sensitivity in predicting PICU admission if the score is less than 4 and good specificity if it is more than 6. Thus, a score <4 can suggest non-requirement of PICU admission (negative likelihood ratio of 0.059), and a score of above 6 can suggest a need for PICU admission (positive likelihood ratio of 46.2). Like any other predictive score, this needs further validation in other settings before clinical use. The profile of children with bronchiolitis can vary across different settings, and hence the risk factors as well as the weightage of individual risks in predicting PICU admission can vary. This makes the development and adoption of any universally applicable predictive score extremely challenging.

Overall, though it appears that the severity of RSV infection during the study period (post-COVID-19 waves) appears to be more

if we just go by the proportion of children requiring PICU admission in this study, that number seems to be a referral bias, as evidenced by the higher proportion of children with comorbidities in the study population. Hence RSV infection seems to have gotten back to its familiar pattern in the post-COVID-19 era with possibly increasing numbers predicted due to the larger pool of susceptible children in the community.

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REFERENCES

1. Walker CLF, Rudan I, Liu L, Nair H, Theodoratou E, Bhutta ZA, et al. Global burden of childhood pneumonia and diarrhoea. *Lancet* 2013;381(9875):1405–1416. DOI: 10.1016/S0140-6736(13)60222-6.
2. Li Y, Wang X, Blau DM, Caballero MT, Feikin DR, Gill CJ, et al. Global, regional, and national disease burden estimates of acute lower respiratory infections due to respiratory syncytial virus in children younger than 5 years in 2019: A systematic analysis. *Lancet* 2022;399(10340):2047–2064. DOI: 10.1016/S0140-6736(22)00478-0.
3. Di Mattia G, Nenna R, Mancino E, Rizzo V, Pierangeli A, Villani A, et al. During the COVID-19 pandemic where has respiratory syncytial virus gone? *Pediatr Pulmonol* 2021;56(10):3106–3109. DOI: 10.1002/ppul.25582.
4. Ghosh A, Annigeri S, Hemram SK, Dey PK, Mazumder S. Clinico-demographic profile and predictors of intensive care need in children with respiratory syncytial virus-associated acute lower respiratory illness during its recent outbreak alongside ongoing COVID-19 pandemic: An Eastern Indian perspective. *IJCCM* 2022;26(11):1210–1217. DOI: 10.5005/jp-journals-10071-24350.
5. Cai W, Buda S, Schuler E, Hirve S, Zhang W, Haas W. Risk factors for hospitalized respiratory syncytial virus disease and its severe outcomes. *Influenza Other Respir Viruses* 2020;14(6):658–670. DOI: 10.1111/irv.12729.
6. González-Ortiz AM, Bernal-Silva S, Comas-García A, Vega-Morúa M, Garrocho-Rangel ME, Noyola DE. Severe respiratory syncytial virus infection in hospitalized children. *Arch Med Res* 2019;50(6):377–383. DOI: 10.1016/j.arcmed.2019.10.005.