



Pediatric SARS-CoV-2 Infection: Risk Factors for Severity Comparing the First and Second Wave of the Pandemic

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The coronavirus disease 2019 (COVID-19) pandemic caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) caused significant morbidity and mortality among adults, and a sizeable population of infants and children were also affected. As the understanding of COVID-19 in children is evolving, studies done around the world have shown the dynamics and clinical manifestations of pediatric SARS-CoV-2 infection [1]. Few studies from India have reported the clinical manifestations and severity of COVID-19 infection in children. The presence of comorbidities has been an important risk factor for severe disease and mortality [2]. As newer variants of concern emerge, knowledge of COVID-19 infection among children during the previous waves is important to determine the group of children that are at risk for severe disease.

In this issue of the Journal, Muthusamy et al. [3] have retrospectively evaluated the clinical manifestations and short-term outcomes in children with COVID-19 infection during the first and second waves of the pandemic in India. All children less than 16 y of age admitted between March 2020 and September 2021 with acute SARS-CoV-2 infection and nasopharyngeal swab positive for either one of the following—rapid antigen test, real-time polymerase chain reaction (RT-PCR), TrueNat or GeneXpert were included and their charts were retrospectively reviewed. Demographic data, comorbidities, symptoms at presentation, complications during the hospital stay, and treatment received were noted. In-hospital mortality, the need for invasive ventilation, the duration of the intensive care unit (ICU), and the hospital stay were taken as outcome measures. The categorization (categories A, B, and C) was based on the recent state guidelines. Comparisons were made between the first (March 2020 to March 2021) and the second waves (April

2021 to September 2021). Of the 1024 children with acute SARS-CoV-2 infection, 592 (58%) were admitted during the first wave and 432 (42%) during the second wave. Fever (62.6%), diarrhea (11.5%), and cough (10.1%) were the most common presenting symptoms. Children with comorbidities, respiratory distress, neurological manifestations, and shock were significantly more ($p < 0.05$) during the second wave, as were the requirements for invasive ventilation and ICU stay ($p < 0.05$). Of the 7 (first wave - 1; second wave - 6) children that died, 6 had pre-existing comorbidities. Preterm babies and children with neurological comorbidities were at a high risk of severe COVID-19 infection.

This retrospective study is one of the few studies that compared the manifestations and risk factors between the first and second waves in a subpopulation of Indian children. Globally dominant variants—alpha during the first wave and delta during the second wave—had significant differences in presentation. Compared to the alpha variant, the delta variant was more transmissible and associated with severe disease [4], which has been shown in this study as well. Other studies have also shown that children with neurological comorbidities and preterm babies have a higher risk of severe COVID-19 infections. In their study on children aged less than 2 y, Woodruff et al. [5] showed that neurological disorders, prematurity, chronic lung disease, cardiovascular disease, and airway anomalies were associated with severe disease and Kompaniyets et al. [6], in their cross-sectional review showed that prematurity is an important risk factor for severe COVID-19 infection. This study, though retrospective in nature, sheds some light on the children at high risk for severe COVID-19 infections. With new variants of concern emerging and lower vaccination coverage in Indian children at present, periodic updates with prospective studies looking at the severity of pediatric COVID-19 infections are required.

This study looked only at the short-term outcomes of COVID-19 infections. It is also important to document the long-term effects of COVID-19 infections in children.

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With poor vaccination coverage for COVID-19 in children, research is needed to prioritize vaccines for those children that are at the highest risk of severe infection.

Declarations

Conflict of Interest None.

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