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Invited Commentary | Pediatrics

COVID-19 in Children—Not Just Little Adults

Jennifer E. Schuster, MD, MSc; Annabelle de St Maurice, MD, MPH

Risk factors for severe COVID-19 in adults have been well described; in contrast, limited data on pediatric risk factors for COVID-19 hospitalization have been published. Children make up a small proportion of COVID-19 hospitalizations, and severe disease is overall uncommon.¹ For this reason, data from multiple sites are needed to provide a comprehensive understanding of the severity of pediatric COVID-19.

Elsewhere in *JAMA Network Open*, Kompaniyets et al² used an all-payer database to determine the risk of severe COVID-19 associated with specific underlying medical conditions among children. This robust database covers more than 3 million children from 900 geographically dispersed hospitals, including emergency department encounters. Data from March 1, 2020, through January 31, 2021, and for more than 43 000 children with COVID-19 were included. Most children were aged 12 to 18 years and either Hispanic/Latino or non-Hispanic Black individuals, reflecting national trends for pediatric COVID-19. Only 10% of children were hospitalized, but nearly 30% of those hospitalized required intensive care unit (ICU) management. Although a number of underlying conditions were associated with hospitalization, children with type 1 diabetes, obesity, and cardiac and circulatory congenital anomalies had the highest risk of hospitalization. Interestingly, trauma and stressor-related disorders, anxiety and fear-related disorders, and depressive disorders were also associated with hospitalization, reflecting the toll that the pandemic has taken on pediatric mental health. The risk of severe COVID-19 illness (eg, ICU care) was the highest among children with type 1 diabetes and cardiac conditions. Children with complex chronic diseases were almost 8 times more likely to be hospitalized and 3 times more likely to have severe disease than children with no chronic diseases.

These data add to the existing literature regarding COVID-19 severity in children. In one cohort,³ 40% of children with COVID-19 hospitalized in North American ICUs had medically complex conditions. Nearly one-quarter were immunosuppressed or had a malignant neoplasm, and 15% had obesity. Among hospitalized children identified from the COVID-19 Associated Hospitalization Surveillance Network, 42% had an underlying medical condition, including 38% with obesity.¹ Asthma was present in 14%, but only 3% had a history of diabetes. Approximately one-third were admitted to the ICU, but a subset of these had multisystem inflammatory syndrome in children as opposed to acute COVID-19. In another large cohort of US children,⁴ 62% of children hospitalized with acute COVID-19 had an underlying medical condition.

Large database studies can be leveraged to provide information about uncommon diseases, including severe pediatric COVID-19, but these studies have limitations. Less common medical conditions, including malignant neoplasms, may not have been well represented in this database, and only conditions with a frequency of more than 0.7% were included in the analysis. Most children were adolescents, and risk factors differed when the data were age stratified, suggesting recommendations for COVID-19 management and prevention should also vary by age. Lastly, attributing associations can be difficult. Children with underlying medical conditions may have been more likely to receive COVID-19 testing and require hospitalization for reasons unrelated to COVID-19. Although type 1 diabetes was associated with hospitalization, admission may have been related to diabetic ketoacidosis (DKA) rather than COVID-19. At some hospitals, children with DKA may be routinely cared for in the ICU, as opposed to the general wards, due to need for continuous medication infusions and close monitoring of vital signs; thus, hospital policies for patient placement could confound severity assessments. Children with cardiac anomalies may be more likely to have surgeries and procedures, necessitating preprocedural COVID-19 testing with asymptomatic

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positivity and ICU stays related to surgery. Lastly, increasing numbers of children are presenting to the emergency department with mental health concerns, including those who require inpatient admission.⁵ The identification of psychiatric disorders as a risk factor for hospitalization could be related to inpatient psychiatric facilities requiring COVID-19 testing prior to intake. Patients with mental health disorders may be hospitalized for mental health reasons unrelated to their COVID-19 diagnosis. Whether or not COVID-19 infection increases severity of underlying mental disorders in children is poorly understood; however, there are reports of psychiatric conditions in adults and children diagnosed with or recovering from COVID-19, and a recent study suggests that psychiatric illness in adults may increase the risk of COVID-19.⁶

Although hospitalization rates for children with COVID-19 are significantly lower than adults,¹ an understanding of specific risk factors for severe COVID-19 among pediatric patients is needed to guide treatment and preventative strategies, including use of monoclonal antibodies and vaccines. When vaccines are licensed for children, risk-based prioritization for pediatrics may be necessary given limited vaccine supply. Current COVID-19 prophylaxis targets pediatric groups based on adult risk factors and/or pediatric non-COVID-19 respiratory illnesses. Throughout this pandemic, pediatric practitioners have been making decisions extrapolated from adult data. This study identifies factors associated with severe pediatric COVID-19 and highlights the need for multicenter collaborations and dedicated funding to study pediatric COVID-19. To provide the best care for children, we need pediatric-specific data.

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